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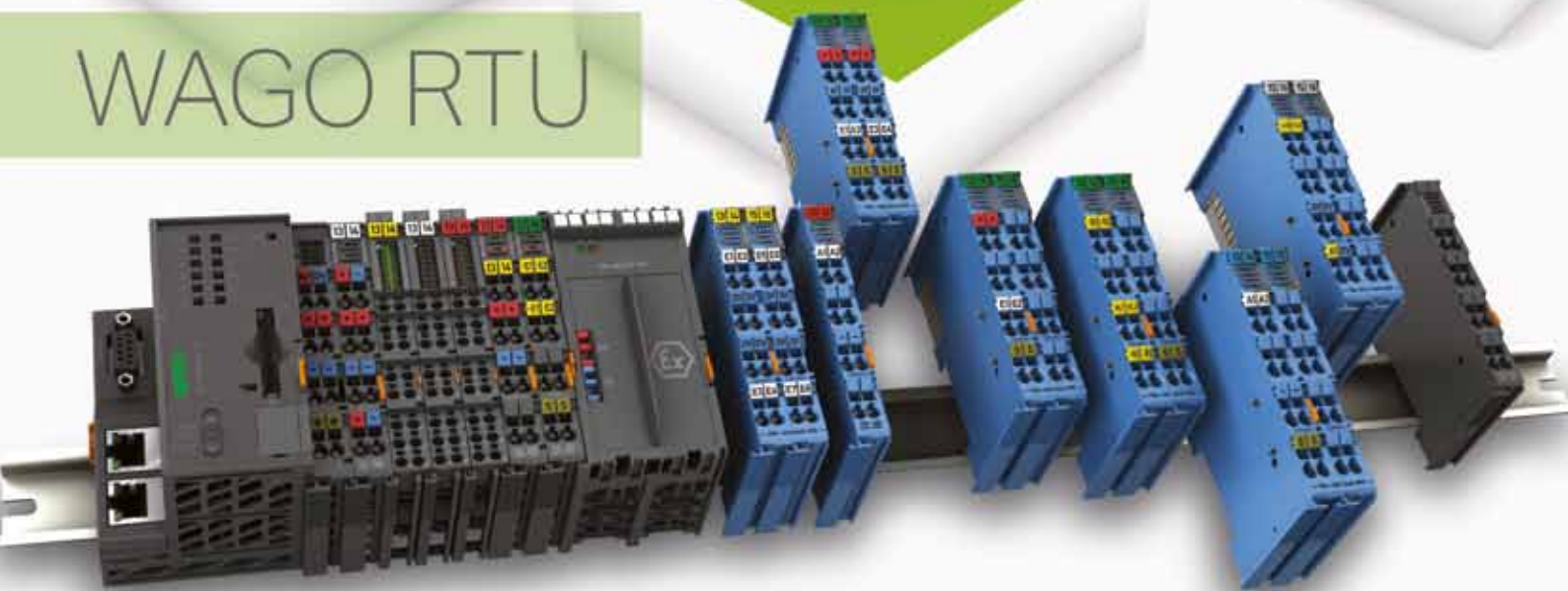
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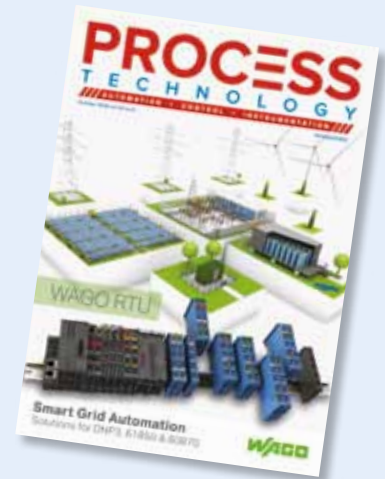
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Furthermore, the controller encodes data directly via SSL/TLS 1.2 and supports parallel data access via OPC UA or to the cloud via MQTT.

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MAKING SENSE OF COMPLEXITY

Industry 4.0 and associated developments in the digital world are ushering in a new era that promises to reshape process control environments by making a vast range of tasks more manageable and understandable.





Process control environments are being reshaped by Industry 4.0 — the cyberphysical systems-based Fourth Industrial Revolution, which is itself being driven by technologies such as digitisation, the Internet of Things, big data, artificial intelligence and virtual reality. These technologies hold the promise of making many increasingly complex tasks such as fault detection and diagnosis, as well as process optimisation, more understandable and manageable.

What's more, they are opening the door to tomorrow's networked control centres. To be successful, however, these developments will require advanced collaborative work environments and a high-performance workforce.

Just as self-driving cars are set to transform the transportation sector, sophisticated digital automation programs are dramatically changing the operation of industrial processes. Driven by inexpensive sensors and powerful artificial intelligence algorithms capable of image recognition, vibration monitoring and much more, such programs are increasingly replacing human sensing. Indeed, in many cases, they are already making it possible for a single operator to manage an entire plant section.

Nevertheless, the picture is still far from ideal. Although integrated industrial information systems gather operational data to enable collaboration¹ and make real-time data available to appropriate individuals, McKinsey² has shown that in the case of offshore platforms, only a small portion of the resulting data is actually used as a basis for operational decisions (Figure 1).

Data availability: breaking down information silos

Why is the potential of Industry 4.0 not being more fully realised? The answer often boils down to complexity. Modern process plants are highly interrelated systems.

A problem in one part of a process tends to propagate across different subsystems and plant components. Advanced automation systems add dynamic interactions between these components, making it difficult to obtain a clear assessment of potential problems. Added to this inherent systems complexity is the human element, which may involve the collaboration of a multidisciplinary team and the involvement of specialised expertise, often represented by an external supplier.

Unfortunately, collaboration between personnel from different disciplines, locations and organisations is often hindered by the fact that the information needed to solve the problem at hand is hidden within information silos. Many companies also lack the organisation and work processes to support multidisciplinary collaboration, and therefore tend to execute work based on a relay race approach instead of as a collaborative effort.

Companies are hardly blind to these challenges. In fact, it is clear to most that, because of the trend towards growing levels of digitally generated data, they need to improve the way they work in order to be competitive.

Progressive companies are responding by improving workforce effectiveness through the introduction of digital technologies. For example, many are introducing bring-your-own-device (BYOD) policies, as well as solutions that enable employees to work effectively wherever they are, whether in the control room, on the shop floor or working remotely. The idea, in short, is to provide the same level of digital support to the industrial worker as has been available to office workers for years.

Information previously hidden within control systems or proprietary tools is now increasingly made available through improved connectivity and integration across systems and network layers. This trend is, in turn, opening the door to web-based



Figure 1: Only a small percentage of the data generated in many industrial processes is being used as the basis of operational decisions.

applications that support consolidation of data from different systems and tools, making these easily accessible from any location. All in all, easy access to data and a common work environment is the first step to enabling effective collaboration to support process operation. Improvements in analytics and visualisation techniques also help workers to make sense of increasing amounts of data.

Other technology trends are also supporting a new collaborative approach to work. Videoconferencing technology has matured, allowing many companies to have remote operation centres that support local control rooms with open video links between locations. High-quality videoconferencing technology is also available from mobile devices or personal workstations, enabling operators to obtain instant access to remote expertise.

In combination, the introduction of digital technology for easy access to information, independent of location, and the proliferation of videoconferencing to support remote collaboration, are blurring the boundaries between local and remote operation.

Insights into process operation

Modern automation systems can cover most aspects of normal operation but also handle many anomalous situations. Advanced control techniques such as model-predictive control (MPC) and state-based control

(SBC)³ allow the automation of very complex tasks, such as the start-up of an industrial plant. Indeed, automatic control performs better than typical human operators. As a result, operators are less and less involved in the inner control loops that are directly in contact with processes. Their tasks are increasingly shifting to supervisory control⁴, where the operator manages and supervises a large number of control modules. But being less involved in direct process control also means fewer possibilities to develop a feeling for a process by training on the job — a problem that was dramatically illustrated with the loss of flight AF447⁵.

To be able to take over when automation fails, operators need higher qualifications and a profound understanding of underlying technical processes, automation systems and control modules. Simulator training is necessary to develop a feeling for processes.

Operators should also be deeply involved in the optimisation of process operations, because this keeps them involved and helps to build up the required knowledge that allows them to take over in case of automation failure.

Not only can Industry 4.0 have a profound influence on information flows and availability, it is also set to have a huge impact on industrial quality control⁶. Big data techniques make it possible to distil historical process data into algorithms that can predict the quality of production⁷.

Developing problems can be detected early and countermeasures can be taken before impact becomes significant. Previously, it took an operator many years to accumulate comparable experience.

Remote expertise can also play a decisive role in failure avoidance. For example, in the case of the Deepwater Horizon oil spill⁸, the investigation report clearly states that one major factor contributing to the accident was the incorrect interpretation of available measurements. Quite likely, advice from highly qualified remote experts would have avoided this accident.

Process performance optimisation

Key performance indicators (KPIs) for process operations in areas such as control loop performance, alarm management, energy efficiency and overall equipment efficiency are described in detail in Hollender et al⁹. Managing these KPIs is not a classic operator task but is becoming more and more important in terms of ensuring good production performance. Areas such as operations, maintenance and analytics need to be managed holistically to achieve the best results. Many of the associated tasks can either be performed by centralised internal service centres or outsourced to specialised external service providers.

Typical goals are increased production plant throughput, efficiency and uptime¹⁰. These can be achieved through a structured



approach to revealing the sources of and responses to process variations and upsets. By reducing process variations, operational flexibility, plant regularity, safety and integrity will be increased, while off-spec production, energy costs, environmental impact, operator stress and equipment wear will be reduced.

An example is provided by Dow Chemical, which has introduced a global analytics layer that distils vast amounts of data into readily understandable information and metrics¹¹. As a result, experts from a centralised analytical technology centre can now support plants globally to determine manufacturing obstacles, improve efficiencies and develop best practices.

Tomorrow's control rooms and operators

As mentioned above, most simple parts of traditional operator work have been taken over by automation. Modern operators now have a very different profile from their predecessors. They supervise large numbers of control modules and must be able to quickly diagnose complex situations, collaborate with various support units and coordinate field operators and maintenance personnel. They decide when it is time to bring in external expertise and manage the integration of remote experts. To achieve their full potential, they need a work environment that supports these activities.

In this connection, a challenge will be how to design collaborative environments that will replace traditional control rooms. Often, such centres will not need to be physically close to a process, but will need to be much better integrated with remote service communities in their own company, as well as associated service providers and suppliers.

The involvement of experienced control room designers from an early stage on will be essential to the design of next-generation collaborative operation centres. Such centres will require a totally new approach that takes the full potential of Industry 4.0 into account. As the traditional way of building control rooms becomes obsolete, new best practices will have to be defined.

The new centres will contain fewer operators, while the roles of operators will evolve from reactive to predictive problem-solving and analytics. To achieve this, operators will have to be highly qualified and capable of interacting with many other specialised functions, such as IT/OT support, multifunctional support, technical and remote support, asset risk management, alarm handling, safety, cybersecurity and maintenance management.

Frequent interactive communication with a very broad range of remote service specialists — something that is still rare today but will be the norm tomorrow — demands a new look at factors such as room layout, working zones, monitors, cameras, analytical tools and remote collaboration workspaces.

Although working in a 24/7 environment can be exciting, it can also lead to reduced life expectancy. With this in mind, a well-designed operator platform should be able to be adapted and even automated to meet each user's needs. For example, the distance between eyes and monitors can be automatically adjusted to reduce eye strain, and lighting can shift throughout the day to optimise circadian rhythms. Furthermore, big data analytics makes it possible to create a data-driven 'day-by-day' improvement program for operators.

Next-generation operators

As control centres metamorphose into collaboration centres, a major challenge will be to attract the next generation of operators — a generation for whom the connection between personal ergonomics and health is fundamental. This increasingly important factor calls for workplace designs that not only minimise acoustic disturbances, while optimising factors such as illumination and air quality, but take into account aspects of the psychosocial working environment such as gamification, collaboration, individual space, flexibility, learning, sustainability, social presence, emotional engagement and creativity. All in all, technological development driven by operators' needs can be expected to transform tomorrow's working environment.

References

1. Pfeffer J, Graube M, Reipschlaeger P et al 2015, 'Towards Collaborative Plant Control using a Distributed Information and Interaction Space', *IEEE 20th Conference on Emerging Technologies & Factory Automation (ETFA)*.
2. McKinsey Digital 2015, *Industry 4.0: How to navigate digitization of the manufacturing sector*.
3. Hollender M 2009, *Collaborative Process Automation Systems*, ISA.
4. Sheridan T B 1992, *Telerobotics, automation, and human supervisory control*, MIT Press.
5. BEA 2012, *Final Report: On the accident on 1st June 2009*.
6. Lorenz M, Rüßmann M, Strack R, Lueth K L, Bolle M 2015, *BCG Perspectives: Man and Machine in Industry 4.0*.
7. Atzmüller M, Klöpper B, Mawla H A, Jäschke B et al 2016, *Big data analytics for proactive industrial decision support*. atp edition, 2016, vol. 58, no. 9, pp62–74.
8. National Commission on the BP Deepwater Horizon Oil Spill and Off-shore Drilling 2011, *Deep Water: The Gulf Oil Disaster and the Future of Offshore Drilling: Report to the President*.
9. Hollender M, Chioua M, Schlake J, Merkert L, Petersen H 2016, *KPI-based Process Operation*, atp edition, 2016, vol. 58, no. 9, pp52–61.
10. Bieker H P, Slupphaug O, Johansen T A 2007, Real-Time Production Optimization of Oil and Gas Production Systems: A Technology Survey, *SPE Production & Operations*, vol. 22, no. 4, pp382–391, Society of Petroleum Engineers.
11. Colegrove L F, Seasholtz M B, Khare C 2016, 'Big Data: Getting Started on the Journey', *AIChE CEP Magazine*, March 2016, AIChE.

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The Trio Motion Flexslice series of add-ons allow simple extension of an existing or new EtherCAT network. The Trio Flexslice can work with most EtherCAT masters, along with Trio Master controllers. The bus cycle times and I/O is tightly synchronised using EtherCAT distributed clocks.

Of particular interest is the Flex 3-axis module that can be utilised to provide virtual EtherCAT stepper motor drives. Output is via generic step and direction signals for any stepper motor drivers and works with most micro-stepping drives.

Users may choose to use this Flex slice 3-axis as an encoder input that turns conventional encoders into EtherCAT encoders. Most

common encoder types are supported, examples being incremental, SSI, BISS and ENDAT. Other modules are available including but not limited to 16 I/O (PNP, NPN or analog) and 2-axis analog servo control.

The Flexslice system is fully expandable and each module has a common bus for power and communications, thus negating the need of Cat 5 cables jumping between modules.

Motion Technologies Pty Ltd
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CHEMICAL MANAGEMENT SOLUTION

Bentley Systems has released a chemical management solution for oil and gas companies operating multiple onshore or offshore wells. With the extended functionality of AssetWise CONNECT Edition, users can consolidate chemical and corrosion data into one central source, to make faster, more informed decisions regarding chemical usage, dosage rates, inventory and more, reducing chemical costs and improving availability of inventory across the operation.

AssetWise's chemical management solution helps operators to optimise chemical usage and reduce spending. Operators can monitor all aspects of chemical usage and treatments: corrosion, separation, erosion, production, integrity, sampling, environmental compliance and lab analysis. In doing so, users can predict chemical usages against targets and environmental emissions, while automating scheduling and reporting.

Through a combination of data gathered from sensors and other connected devices through the IIoT and Bentley's connected data environment, AssetWise Operational Analytics gives users the integration of systems and processes that help provide the information they need for precise consolidation, visualisation and analysis.

By bringing all data sources into one central source, Bentley's solution provides full visibility into how chemicals are being used and how effective they are. Interactive dashboards within Operational Analytics provide users with a range of tools and visualisation aids to help track KPIs and create benchmarks across all assets (onshore or offshore) to compare and understand immediately what needs to be improved and where, through a variety of alerts, graphs and reports.

Bentley Systems Pty Ltd
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Loc-Ex 01-BLE beacons have been developed for explosion-hazardous areas and emit Bluetooth low energy signals, making it possible to realise localisation tasks, asset tracking and management. In combination with ecom's mobile devices, this makes them a cost-effective, low maintenance business intelligence solution; the beacons are used to send and provide customer-specific data and connect to backend systems. These small wireless transmitters can also determine the exact position of mobile devices. Specific information — tailored to the mobile worker's task and access authorisation — is transferred to the mobile device with the help of the beacons and an app solution.

Beacons support mobile workers on the job and guarantee safe navigation through explosion-hazardous areas.

The beacons are easy to install due to clever design and a versatile mounting plate. They can be mounted directly on a suitable surface or easily adapted on the optional available mounting plate which facilitates battery exchange for the beacons. The Bluetooth 4.0 standard makes the beacons compatible with smartphones and tablets. The beacon signals can be evaluated by the mobile device via individual applications and interact with the user or other programs.

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The calibrator is a portable multifunction instrument with an integrated electrical module, a hand pump to generate test pressures up to 25 bar and a high-performance data logger. In addition to the calibration of process transmitters and pressure gauges, the same instrument can be used for calibration of temperature, voltage and current.

The safety-related quality of the CPH7000 is also accredited internationally through a CSA Safety approval.

Wika Australia
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PLC WITH UBUNTU OS

The CPL410 PLC from GE Automation & Controls is agnostic to cloud platform providers and combines an embedded Linux Ubuntu OS with GE's RX3i programmable logic controller platform.

GE's CPL410 Outcome Optimising Controller is designed to be versatile and interacts with weather forecasts, stock indices, electricity prices, IoT cloud databases, Linux software apps and historical process data to deliver near-real-time control variables for prediction, advanced analytics and control optimisation.

The PACEdge PLC is built with a 1.2 GHz 4-core processor and real-time hypervisor technology to execute deterministic control concurrently, yet independently to the embedded Linux Ubuntu OS applications. Built for heavy industry and reliable control with hot standby CPU redundancy, the RX3i PLC supports 32,000 IO points, SQLite, Apache, Python, Profinet, Modbus, DNP3 and OPC connectivity via five Gigabit Ethernet ports, while incorporating advanced cybersecurity technology.

Users can develop and run data processing Linux-based applications next to the control system to optimise processes for better and dynamic outcomes for a range of diverse applications, including water and wastewater, industrial steam, automotive, chemical, oil and gas, discrete manufacturing and modular machine designs.

Control Logic Pty Ltd
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PROFINET BUS COUPLER

In Profinet applications, the Axioline F bus coupler is the link between the Axioline F system and the higher-level Ethernet system.

As Phoenix Contact's first Profinet bus coupler, the TPS version of the device offers certification in accordance with Profinet Spec. 2.3.

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

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

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PANEL PC

The iEi Integration UPC-F12C-ULT3 panel PC is powered by Intel's 6th Generation Skylake i5 and Celeron ULT processors, allowing the panel PC to be completely fanless. It comes equipped with 4 GB of DDR4 RAM and supports the M.2 B-Key (2242) SSDs that are compact and have a fast transfer rate.

The UPC-F12C features a full aluminium chassis with all six sides of the device being IP66 rated, including a 12.1" screen which has two options: a resistive touch screen or flat glass PCAP touch screen with 6H hardness.

The panel PC comes in two distinct models: the UPC-F12CM-ULT3 with M12 connectors and the UPC-F12C-ULT3 with standard connectors. Both models support a wide variety of I/O, which includes RS-232 ports, GbE LAN connectors and USB ports. Both panel PCs support Wi-Fi and Bluetooth and have the option to add RFID support.

ICP Electronics Australia Pty Ltd
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THERMAL IMAGING CAMERA

The FLIR T640 thermal imaging camera has a 5 MP visual camera, large 4.3" touchscreen LCD display and autofocus. This camera is capable of 8x continuous zoom and captures images in 640 x 480 thermal resolution, which ensures highly detailed measurements from long range. It is available to rent from TechRentals.

The T640 is able to take high temperature readings, with a range of -40 to 2000°C and accuracy of $\pm 2^\circ\text{C}$ or $\pm 2\%$. Automatic location data is added to every image from the built-in GPS/compass. Data and images are able to be quickly shared to Apple and Android smart devices via the FLIR Tools app.

The camera's ergonomic design includes an optical block that can rotate 120° for easy targeting and auto-orientation to ensure the screen is always easy to read. The large screen features a colour viewfinder for bright conditions and on-screen sketching. It is also capable of taking measurements from 10 different spots simultaneously, periodic image storage (time lapse) and the ability to create instant PDF reports directly from the camera.



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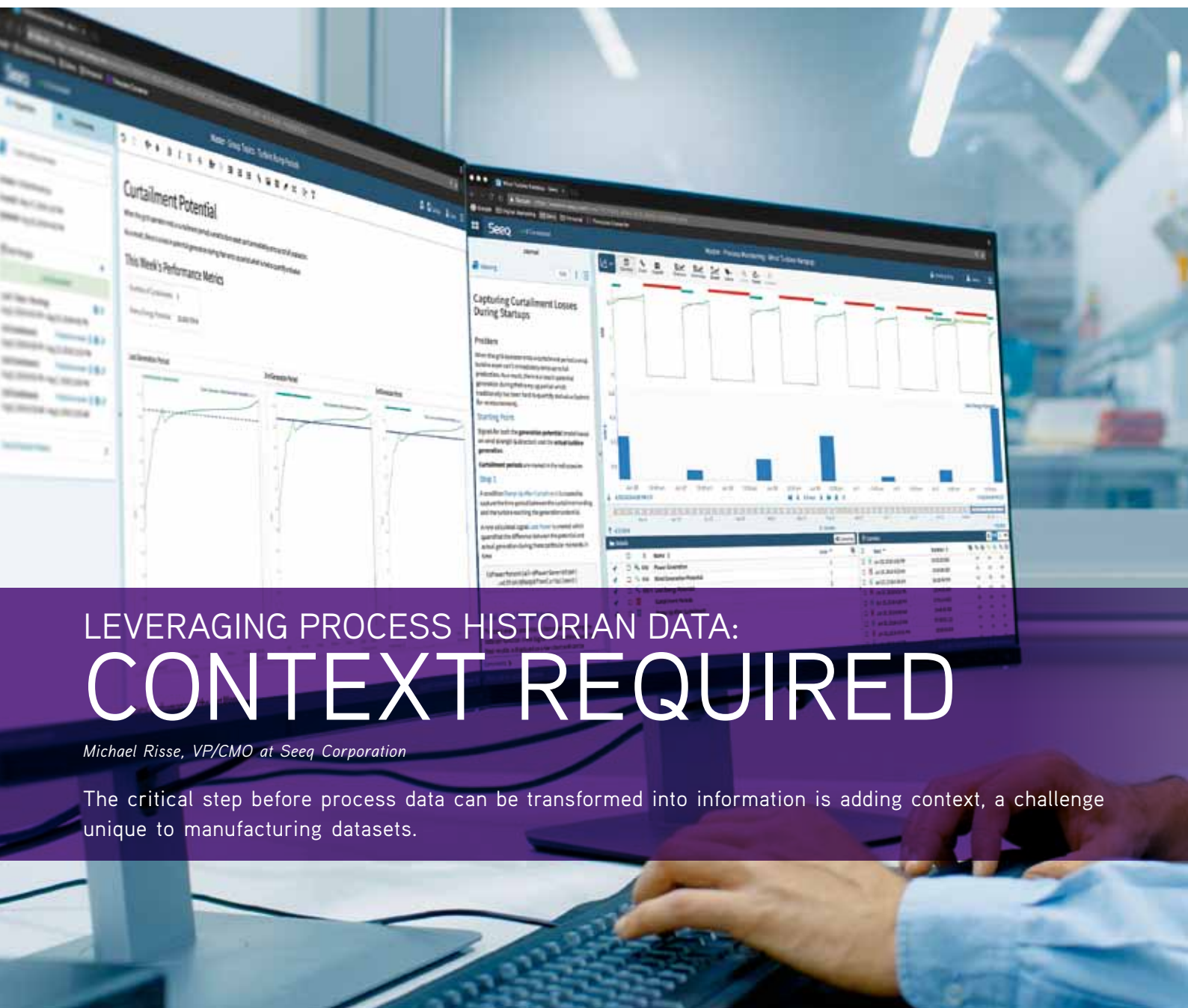
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LEVERAGING PROCESS HISTORIAN DATA: CONTEXT REQUIRED

Michael Risse, VP/CMO at Seeq Corporation

The critical step before process data can be transformed into information is adding context, a challenge unique to manufacturing datasets.

Over the years there has been a growing interest and innovation in time series data storage offerings, including historians, open source and data lake options, and cloud-based services. The plethora of choices ensures industrial manufacturers will find a data management option that fits their needs. Whatever the priorities — data governance, data consolidation, security, analytics or a cloud-first initiative — organisations will have many good choices for where to store data.

At the same time, if an organisation is planning to consolidate their manufacturing data in an enterprise historian or data lake they may find they do not accrue the same benefits as they do with other data types. In fact, if they use expectations based on experience with relational data as a justification for aggregating their manufacturing data, they will be disappointed with the results. With some types of data, consolidation in a single system provides advantages for analytics and insights as compared to distributed datasets, but it's not the same with time series data. Whether it's a data historian, lake, platform, pond, puddle or silo, time series data won't necessarily yield better insights just because it's all in one place.

To understand this, let's consider scenarios where centralising data does benefit the user, for example, relational data. Relational

data has keys that work as handles to the data, ie, tables, fields and column names, so aggregating or centralising data yields more possible relationships among the tables, fields and databases. This isn't new; business intelligence solutions gained significant traction with this approach starting in the 1990s. Today, data storage is so inexpensive vendors can offer platforms providing 'any-to-any' indexes, enabling complete self-service for a business analyst.

Another example is platforms that index all data contained within a semi-structured dataset: for example, web pages, machine logs and various forms of 'digital exhaust'. Two variations of this approach are used by Google and 'document' NoSQL databases such as MongoDB. The idea is that the structure of the data doesn't have to be consistent or defined in advance as in a relational table. Instead, a schema is overlaid on the fly, or after the fact, which enables the user to work with any 'handle' created by the index. Again, this means the more data is centralised and indexed the better. Users get to see more insights across larger datasets and the data is pre-indexed or organised and ready to work.

Keep your data where it is

With structured (relational) and semi-structured (log files, web pages) strategies as success stories for centralising data, it's easy



to see why one could assume consolidating time series data into one place might yield equal benefits to end users, but it doesn't. IT-centric data solutions may try to convince themselves their centralisation models apply to time series data, but they fail like trying to climb a greasy flagpole: it doesn't work without handles.

Why is this? Time series data simply doesn't lend itself to pre-processing the way structured data (relationships) or semi-structured data (indexes) does. There are no 'handles' in a time series signal, so there is no way to add value in pre-processing the data for analytics. This is a key issue for engineers working with the data as they have to, at the time they do their analysis, find a way to integrate 'what am I measuring' (the sensor data) with 'what am I doing' (what an asset or process is doing at the time) and even 'what part of the data is important to me?'

Creating context

As an example of the challenges in working with time series data, let's consider a simple time series dataset that has sensor data recorded every second for a year, or 3.6 million samples, in the form timestamp:value.

Most likely, the user doesn't want all the signal data for their analysis — instead they want to identify time periods of interest

within the signal. For example, perhaps the user needs handles to periods of time within the data for analysis defined by:

- time period, such as by day, by shift, by Tuesdays, by weekdays vs weekends, etc;
- asset state: on, off, warm up, shutdown, etc;
- a calculation: time periods when the second derivative of moving average is negative;
- context in a manufacturing application like an MES, such as when plant or process line is creating a certain product;
- data from a business application, for example when energy price is greater than x;
- a multidimensional combination of any or all of these time periods of interest (like where they overlap, or where they don't);
- an event, for example, if a user wants to see data for the 90-minute period prior to an alarm.

In other words, time periods of interest are when a defined condition is true, and the rest of the data can be ignored for the analysis (Figure 1).

Two things stand out from this example. First, even with a simple example of one year of data from one signal, it's obvious there are an infinite number of ways the signal might be sliced or consumed for analytics purposes. And, since there are so many possible options, the actual choosing of the time periods of interest can only be done at analytics time when the user's intent is clear and the relevant time segments may be identified. In addition, this example is just one signal. Imagine production environments of 20,000 to 70,000 signals such as pharmaceutical or chemical plants, oil refineries with over 100,000 signals, or enterprise roll-ups of sensor data that include millions of signals.

Second, while the examples above use the term "defined by..." to describe the time periods of interest, we can also call this 'contextualisation'. Generally, industry use of contextualisation is when data is merged from different data sources, like a batch system, signal and quality metric coming together in a data model. But in the examples above, the context can come from anywhere: a measurement, another application or simply the user's expertise and intuition.

Contextualisation, at analytics time and in the hands of the engineer, is what transforms time series data from a squiggly line in a control chart into data objects of interest for analysis, and all of its forms should be included in its definition (see Figure 2).

Finally, it is important to remember that any analysis of time series data involves sampling of analog signals with strict adherence to the challenges of interpolation and calculus, something that IT data consolidation/aggregation efforts typically don't address. The ability to align signals with different sample rates from different data sources in different time zones spanning daylight savings time or other changes is an absolute requirement prior to enabling the defining of the relevant time periods.

Exceptions to the rule

There are possible exceptions to analytics-time context because dynamic contextualisation is not always a requirement for some work products. A standard report or KPI, such as a weekly status summary or OEE score, has the time periods of interest defined in advance and then used repeatedly in the analysis.

Historians



TIME SERIES DATA SIMPLY DOESN'T LEND ITSELF TO PRE-PROCESSING THE WAY STRUCTURED DATA (RELATIONSHIPS) OR SEMI-STRUCTURED DATA (INDEXES) DOES.

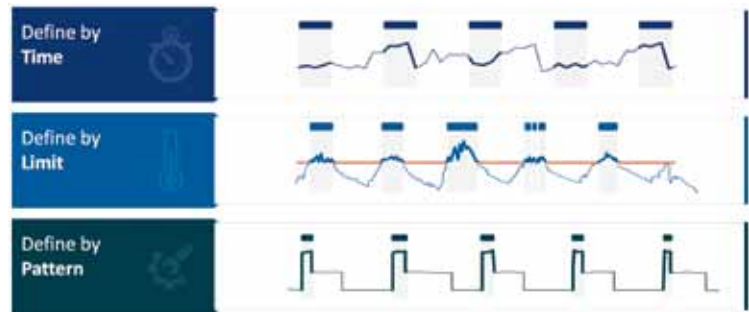


Figure 1: The ability to define the time periods of interest within a signal based on any type of criteria is a critical analytics-time component of working with time series data.



Figure 2: An example of an analytics application in which time periods of interest are marked by coloured bars at the top of the trending pane. In this case they denote areas that need to be addressed in a data cleansing effort.

On the other hand, if it's an ad hoc investigation such as root cause analysis or understanding variation in a quality metric, then only engineers at analytics time, when they are doing the work, will be able to define the data dimensions required for analysis.

Knowing what you are looking for in advance, or not, is the difference between fixed reporting solutions using static definitions of time periods (even if they provide a drop-down selection of time ranges, it's still defined in advance), and high-value dynamic, ad hoc, analytics and investigation efforts.

Process expertise is required to create context

One outcome of the need for analytics-time contextualisation is that many data scientists start at a disadvantage when working with time series data. This is because they can't run their algorithms until the data is modelled, which means focusing or contextualising the data they are working with first. But who knows the time periods of interest and relevant contextual relationships needed for a particular analysis? The engineer. The experience, expertise and ability to define the relevant data for investigations and analyses is all in the same person.

Contextualisation — and the engineers who understand the assets and processes — is therefore imperative to time series analytics regardless of the data management strategy. Only the engineer, who alone has the expertise and understands the needs of their analysis, will know what they are looking for right at the time of investigation. This includes the ability to rapidly define, assemble

and work with the time periods of interest within time series data, including access to related data in manufacturing, business, lab and other systems.

Conclusion

There is ever more attention and pressure for digital transformation and the required IT/OT integration necessary to provide an integrated view across business and production datasets. Therefore, it's going to be increasingly important for IT and manufacturing organisations to recognise the importance of contextualisation regardless of storage strategy in working with time series data.

The engineer who knows what they are looking for, and can ask for it at analytics time, is going to define and enable the advanced analytics and insights that are the focus of smart industry and Industry 4.0 investments. Therefore, organisations that align the contextualisation requirements of time series analytics with their data strategy will have a higher chance of improving production outcomes through insights.

Where the data is — in a historian or many historians, in a data lake, on-premise or in the cloud — isn't going to change the required analytics effort. There are great reasons and offerings for data storage and consolidation, on-premise and in the cloud, but the priority for insight is accelerating the expertise of process engineers and experts.

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MAGNETIC CYLINDER SENSOR

The MZCG magnetic cylinder sensor from SICK is designed for position detection in pneumatic grippers or miniature pneumatic cylinders with C-slots. Due to its universal housing design, the product fits in a wide range of C-slots from the most common manufacturers, which allows for a more flexible machine design.

With a housing of only 12.2 mm and a 90° rotated radial cable connection, the sensor is suitable for small drives. With easy mounting, it can be inserted into the C-slot via drop-in and fastened quickly.

The short switching point of the magnetic cylinder sensor, which has been optimised for gripper applications, enables fast cycle times and is said to improve the efficiency of the process. The cable can withstand high torsional forces and a large number of rapid direction changes, making it suitable for use in highly dynamic applications such as robotics, handling, mounting and the electronics industry.

SICK Pty Ltd

www.sick.com.au

SIX-AXIS COLLABORATIVE ROBOT

Japanese company Nachi has released its CZ10 six-axis collaborative robot. Featuring power- and force-limiting technology, the CZ10 can work safely with, or in close proximity to, humans, as it has a safety mechanism to stop instantaneously should it come in contact with an operator. Operator pinch points are eliminated by having minimum clearance of 25 mm or more between arms and joints. The CZ 10 is certified to ISO 10218-1 and TS 15066 standards.

In addition to standard robot programming through the teach pendant, the user can hand-guide the CZ10 when teaching it new program paths. A digital I/O connector for applications and a built-in air connection are available at the wrist. Enhanced safety certified functions are achieved with a built-in robot monitoring unit. CZ10 units have a payload capacity of 10 kg and horizontal reach of 1300 mm.

Nachi Australia Pty Ltd

www.nachirobotics.com.au



DISTANCE SENSORS

With the ODS 110/HT 110 and HRT 25B L distance sensors, Leuze electronic is expanding its series of distance sensors and is offering a large selection of different designs with long operating ranges and several switching points.

Due to their compact housing size and with an operating range of up to 5 m, they are particularly suited for use in situations with limited installation space in pallet warehouses and for applications in the field of automated material flow for which at least two different switching points are required.

In addition to the multidepth compartment occupation check, these include, for example, push-through or collision protection in shuttle applications. These distance sensors are characterised by a high repeatability of 3 mm and high colour and surface independence ensuring fine positioning as well as easy commissioning. Models with an analog output and IO-Link are also available.

Leuze electronic Pty Ltd

www.leuze.com.au

ANALOG SAFETY INPUT MODULE

The latest Pilz analog input module PNOZ m EF 4AI expands the PNOZmulti 2 range of configurable, safe small control systems. It can be used to safely record and monitor any process up to PL e or SIL CL 3. One particular advantage is the separate module program (mIQ) which can be used to make fine-granular adjustments of the measured value.

The separate module program mIQ provides fast reaction times with its decentralised processing in the module. PNOZ m EF 4AI uses the PNOZmulti Configurator software tool to provide software blocks for input, plausibility, scaling and arithmetic functions. Even while configuring, the analog measurement values can be scaled in numerical quantities with any unit. The limit value, range or working area monitoring can easily be parameterised via the software module with a few mouse-clicks. The concept guarantees that the standard measurement range of sensors is safely maintained.

The module provides four independent, safe analog 4–20 mA current inputs with a resolution of 15 bits plus sign bit. The measurement range is 0–25 mA.

Arithmetic functions such as averaging, differential pressure calculation etc facilitate the use and enable more exact and faster diagnostics. Up to six analog values per module can be transferred to the fieldbus, so that processes can be accessed faster. In combination with the PASvisu visualisation software, analog values can be displayed and evaluated.

Pilz Australia Industrial Automation LP

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MODULAR CONNECTOR SYSTEM

Lapp is introducing to Australia its EPIC MH module systems that combine energy, signals and data in one connector. The modular connector system is designed to deliver easier assembly of the modules in the fixed EPIC modular frame.

The EPIC MH modular system can receive power of up to 200 A and voltages of up to 1000 V. It supports data rates of up to 10 Gbps and offers a housing selection with 138 million variations. The flexibility and cost-efficiency of the system make it highly relevant to applications such as electronics and communications; measurement, testing and control technology; mechanical engineering and appliances; drive technology and industrial automation; and photovoltaic systems.

Modules are firmly fitted into the MH system frame with a click system. Foreign modules can be mounted with the Lapp MH red clip. The system delivers high flexibility by the use of any combination of inserts in one connector. It is universal in application when combined with the broader Lapp families of products, including EPIC housings, SKINTOP cable glands, SILVYN conduits and the ÖLFLEX cable range.

LAPP Australia Pty Ltd

lappaustralia.com.au



LIGHT CURTAINS

Reer MICRON light curtains are suitable for industrial and civil applications where it is necessary to detect, measure and recognise objects.

Depending on the number and position of the beams engaged by an object, Micron can provide real-time information to a PLC or PC in order to detect the presence or absence of objects, perform a count, detect a position, detect a shape or a profile, and measure dimensions.

The light curtains are available with the beams spacing 5, 10, 25, 30, 50 and 75mm. Up to three Micron B light curtains can be connected at the same time as nodes of an RS485 serial line for simultaneous detection of multiple dimensions and complex measurements.

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PROFIBUS TESTER

The Softing BC-700-PB Profibus Tester 5 is an all-in-one tool for bus physics, bus communication and cabling. Available to rent from TechRentals, it is suitable for installation, set-up and commissioning, documentation, acceptance testing, network optimisation, preventive maintenance, troubleshooting and laboratory tests. The instrument is a combination of a signal tester, storage oscilloscope, protocol analyser, master simulator and cable tester.

The Profibus Tester 5 is battery operated and includes a graphical display that provides comprehensive test results in an easy-to-understand format making it suitable for users of all experience levels. It can be used in standalone mode or can be connected to a PC for extended diagnostics. Its test report generation enables both a quick test and user-controlled test. It also has an automatic baud rate detection from 9.6 Kbps to 12 Mbps.

TechRentals

www.techrentals.com.au



MOTORS WITH 300% OVERLOAD CAPACITY

NORD DRIVESYSTEMS manufactures energy-saving three-phase motors of classes IE1, IE2, IE3 and IE4. The motors are said to be robust, efficient and reliable and offer a high power density, high torques and a high overload capacity of up to 300%.

The IE3/IE4 motors have a significantly extended operating range, which means that no safety reserves or lower safety reserves need to be taken into account for the design of the drive unit.

The robust aluminium motor housing has protection class IP69K and can also be pressure cleaned. As an option, the nsd tupH surface treatment is available.

The IE4 synchronous motors are particularly economical due to the use of permanent magnets in the rotor while high efficiency remains unchanged, even during partial load operation and at low speeds. This makes them suitable for fluctuating loads due to different products or batch sizes.

The NORD IE4 motor range comprises synchronous motors with powers from 0.75 to 5.5 kW and asynchronous motors with powers from 0.12 to 55 kW. ATEX versions are also available.

NORD DRIVESYSTEMS (Aust) Pty Ltd

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POWER PLANT CONTROL SYSTEMS UPGRADE

MULTIPLE BENEFITS DELIVERED

Ratch Australia owns a 230 MW gas-fired power plant in Townsville that supplies electricity to some 300,000 households, and another 300 MW plant at Kemerton in WA that supplies around 250,000 households.

Strict power price agreements place onus on the electricity generator to provide power when required and significant penalties apply if this is not the case. Ratch decided that a higher level of certainty and flexibility was required in its control platform, so Emerson Automation Solutions was contracted to deliver a new Ovation distributed control system (DCS) and safety instrumented system (SIS) for both the Kemerton and Townsville power stations.

Emerson's Martin Kolos says Ovation has a significant global footprint in all generation types, including fossil fuel thermal, nuclear, biomass, hydro, solar (photovoltaic and concentration) and wind.

"We took the control and safety logic from the existing systems (a mix of Simadyn, Teleperm XP, S95F, and S7 PLC/SCADA), and integrated it all into a single Ovation control system that provides a

unified engineering and operations environment for turbine control, balance of plant control and safety protection systems," he said. "The control logic was migrated on a like-for-like basis which provided the owner with a reduced risk profile in its decision to deviate from the turbine OEM's control systems."

Two open cycle gas turbines for peaking power are installed at the Kemerton power station while the Townsville power station has one combined cycle gas turbine, which includes a heat recovery steam generator and associated steam turbine that is sometimes referred to as the 'Steam Tail'.

Martin says that a key benefit of the Ovation system is that it integrates SIS. "All engineering and operations are carried in the same software environment, which simplifies engineering, testing and commissioning, and also the lifecycle maintenance — which all helps to reduce the total cost of ownership," he explained.

"In the immediate term, key benefits for operators include a higher level of flexibility in making control and tuning enhancements, and a more intuitive user experience.



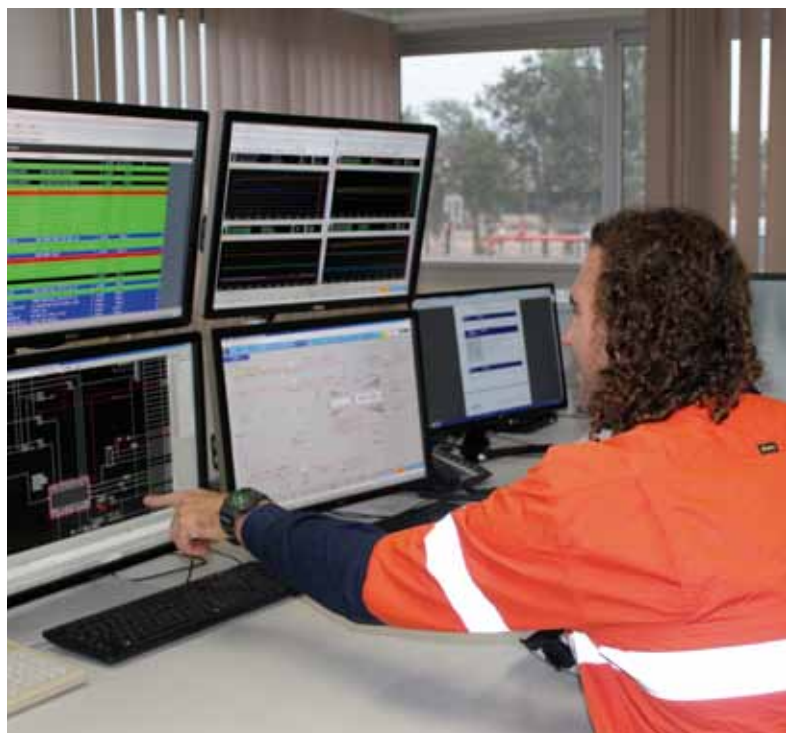
"The longer term benefit is expected to be vastly simplified lifecycle management due to only maintaining a single configuration database for both control logic configuration and operator interface. This is an inherent advantage of DCS technology, and Ovation extends this strength in its ability to control all aspects of power generation."

General Manager Asset Management and Asset Development at Ratch Australia, Tony Polley, says both plants now have centralised control based upon Windows platforms and are fully able to be remotely accessed by mobile devices, which is a huge benefit.

"Productivity is enhanced due to a faster rate of start-up. Also, safety, risk management and the operator interface are all enhanced due to the new state-of-the-art DCS and power conversion equipment," said Polley. "In addition, ongoing generator compliance with the respective technical rules is demonstrable in real time due to installation of online high-speed monitoring and data recording equipment."

"The biggest challenge was the conversion of every logic and input/output (I/O) from the old system to the Ovation platform — and the factory testing of every I/O — which amounted to some 2,500 at Kemerton and 3,500 at Townsville. The new Ovation system is significantly more powerful than the former TXP system and is a genuine control platform rather than just a turbine control and monitoring system."

"Another major challenge was the reconnection to the grid network and proving to the respective authorities and bodies — such as



Western Power, AEMO, Powerlink and Ergon — that the governors and generator performance complied with the technical rules."

Tony points out that given that the previous systems were no longer supported, and spares were very difficult to source, a single component failure could result in a loss of ability to generate from either power station. "Therefore it is reasonable to assess that the likely payback time for the project will be short, in terms of the overall lifecycle," he said.

Steve Clark, Manager Operations at TW Power Services — which provides operational and maintenance services for the Ratch-owned Townsville and Kemerton power stations — says the new control system provided by Emerson offers significant improvement over the previous, antiquated control systems used at the power stations.

"Upgrading from a multi-system control arrangement using a myriad of protocols and interfaces for multiple areas of plant to a single integrated Microsoft Windows-based distributed control system allows Townsville power station to operate in a modern efficient manner," he said.

"Systems which previously required local operation on-site, and out in the field, can now be controlled and monitored from the on-site central control room, or via Microsoft Remote Desktop on practically any internet connected device."

"The previous systems at both Townsville and Kemerton were end-of-life systems with obsolete hardware and with very limited access to spares. With the new Ovation control system there is modern state-of-the-art equipment, with ready access to spare parts from both local and overseas suppliers."

Steve adds that as part of the controls update, both Townsville and Kemerton have access to several after-sales support options including a 24-hour telephone hotline, remote diagnostics and interfacing, and local Australian-based support as well as specialist engineering support from Singapore, the Philippines, Costa Rica, Poland, India and the USA.

Emerson Automation Solutions
www.emersonprocess.com.au

MODULAR DISPLAY MONITORS

The modular design of the FPM-7002 monitor allows the video I/O, which includes HDMI, DVI, VGA and DP, to be flexibly configured for enhanced functionality. The display modules range between 12.1 and 21.5" in size. They can be interchangeably combined into various configurations, reducing component inventory and maintenance times by enabling immediate on-site replacement. The commonality of components allows users to produce multiple products using the same solutions, thereby accelerating development and shortening the time to market.

When equipped with Advantech's optional iLink technology, the FPM-7002 series can support real-time, long-distance (up to 100 m) data and video transmissions via USB to either a single client or up to four clients in clone mode. This functionality enables the optimisation of the placement of PCs and operator panels during cabinet installation. The wiring has also been simplified so only a single LAN Cat6 cable is required for all signal transmissions.

The FPM-7002 series also feature Advantech's picture-in-picture (PiP) technology. This technology allows them to be integrated with two box PCs for simultaneous dual display and dual input control capabilities. This reduces the number of monitors in the field, which lowers KVM costs and ensures easy monitoring for optimised management.

Advantech Australia Pty Ltd

www.advantech.net.au



DIFFERENTIAL PRESSURE MANOMETER

The Dwyer Series 490W hydronic differential pressure manometer utilises wireless transducers and a versatile handheld HMI so that a single operator can monitor and balance a hydronic system in less time than traditional hydronic balancers. A Bluetooth connection with the transducers is used to monitor differential pressure and flow on up to three different valves. Being wireless means there are no hoses to carry, to snag on equipment or to need to be drained. The 490W includes the Dwyer Hydronic Application Software that contains valve charts for numerous manufacturers and converts differential pressure to flow directly on the screen.

The rugged, weatherproof, handheld housing withstands a 1.5 m drop test. Logged data can be shared directly from the handheld over Wi-Fi, GSM or CDMA networks. The ergonomic design is much lighter and easier to work with, providing greater manoeuvrability and quick set-up.

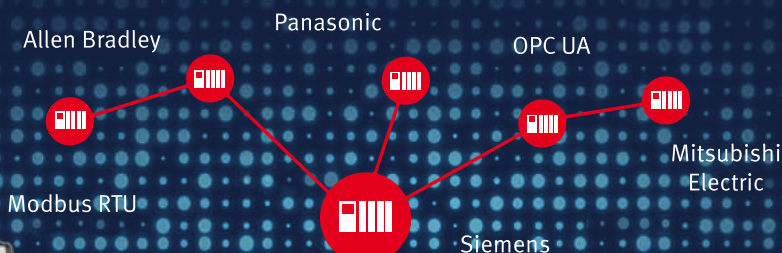
Applications include refrigerant pressure testing, hydronic valve balancing, measuring pressure drop across pumps, and across chillers and coils for freeze protection.

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MOISTURE ANALYSER

The QMA601 process moisture analyser has been updated with an option that makes it suitable for continuous catalyst regeneration (CCR) reforming processes. In CCR reforming, a moisture analyser is a necessary part of the process to ensure that the desired moisture levels remain constant; however, the presence of hydrochloric acid soon compromises sensors, increasing the maintenance cost for the operator.

To prevent the operators from frequent and expensive maintenance Michell engineers developed an updated version of the QMA601 that further extends life of the QCM moisture sensor — making the moisture analyser more cost-efficient in the CCR application. There is also a sample system option that includes a valve isolating the sample from the sensor while allowing a filter drain/bypass flow to continue to purge through the sample line.

Michell's QMA601 process moisture analyser has a lower detection limit of 0.1 ppmv and an upper range of 2000 ppmv.

The process moisture instruments manufactured by Michell Instruments are easy to install, use and maintain. The QMA601 analyser features a full-colour touchscreen interface which allows interrogation and operation in-situ, with no need for a hot works permit. All data logging and readings are easily visible, and the main display also incorporates real-time trend graphing and alarm indicators.

The analyser is fully certified for use in hazardous areas around the world, with accreditations from ATEX, IECEx and cCSAus.

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HOW TO BRIDGE THE INDUSTRY-WIDE KNOWLEDGE GAP



As the pivotal baby boomer generation of factory workers starts to retire, manufacturing organisations face challenges around retaining their valuable skills, experience and knowledge. The generation born in the wake of the Second World War has seen dramatic changes in the industry, from concepts such as lean manufacturing to today's Industry 4.0 approach. Replacing them will likely create a significant challenge for businesses.

The timing of these retirements comes as the manufacturing industry resurges, creating strong opportunities for businesses that are equipped and resourced to take advantage of them before their competitors do. According to the Australian Industry Group's (Ai Group's) Performance of Manufacturing Index, Australian manufacturing has experienced growth for the past 21 months and is the strongest it's been since 2005.¹

Businesses therefore need to minimise the negative effects of retiring workers. They can do this, and get fit for growth, by upskilling existing employees and attracting talented young people to roles in the industry. While manufacturing was previously seen as a dirty, difficult and low-paying option, advancements in technology and processing can contribute to a change in perception, especially for young workers keen to work with emerging technologies.

For example, robots can help manufacturers maintain and improve production levels even as the number of skilled workers declines. And, because robots automate repetitive tasks and can undertake dangerous tasks instead of humans, they free up people to work on more creative tasks. The ideal factory worker of the future could, therefore, be a robotics and programming expert.

However, to make the most of robotics-based solutions, manufacturers need up-to-date IT infrastructure. Cloud-based enterprise resource planning (ERP) solutions are crucial for coordinating robot workflows and sharing data between machines and humans across multiple digital platforms.

In a recent study conducted by Epicor Software, 19% of respondents agreed that they rely on a single core business system to manage all operations.² This streamlined approach minimises the risk of errors and gives business decision-makers a single source of truth to work from.

A good ERP solution should also incorporate analytics, which are crucial because they provide visibility into the information generated by machines, robots and artificial intelligence (AI) algorithms both within the business itself and across the supply chain. This, combined with a targeted Internet of Things (IoT) approach that uses sensors and machine learning to optimise operating conditions and automate even more tasks, can deliver a significant competitive advantage for manufacturers.

The Epicor study found that 41% of young people want the opportunity to work with the latest innovations and 20% of businesses believe that the chance to work with robotics and AI

is a big draw for young talent. Millennials in particular want to be at the cutting edge of new developments, with one-third of those surveyed agreeing the chance to be at the cutting edge is attractive to them. Therefore, a new focus on data, analysis and technology could help attract young, tech-savvy people to manufacturing.

As more young people enter the manufacturing industry, businesses will be better positioned to leverage new and emerging technologies to operate more cost-effectively. Human resources can be freed up from the drudgery of mundane and repetitive tasks to contribute more meaningfully to the business with creative innovation. This approach will help bridge the skills gap presented by the exodus of older workers as they retire. Furthermore, it could help turn this exodus into an impetus for the industry to evolve at a faster rate, potentially leading to sharper competitiveness globally.

Manufacturers that leverage robotics, AI, the IoT and smart ERP systems will be the most attractive to younger workers. It's up to manufacturing organisations to lay the groundwork now by implementing smart technologies and positioning themselves as employers of choice for tomorrow's brightest talent. Doing so will help consolidate the industry's recovery and position both the industry and individual organisation for future growth.

References:

1. <https://www.aigroup.com.au/policy-and-research/economics/economicindicators/>
2. The research was conducted by Morar Consulting on behalf of

Epicor in December 2017. The research questioned 2450 business decision-makers and employees in businesses in 14 countries across the globe about their growth performance in the last 12 months.



**Terri Hiskey is the Vice President of Product Marketing, Manufacturing at Epicor Software. She is an accomplished marketing professional with broad experience in the manufacturing and supply chain sectors.*

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ACHIEVING PREDICTIVE MAINTENANCE USING AN OIL CONDITION MONITORING SYSTEM

Monitoring the condition of lubricating oils is an important part of predictive maintenance.

In hydraulic and lubrication systems, friction, wear, leaks and excess temperatures can contribute to the operating fluid becoming contaminated, with solid particle contamination or water, for example. This contamination then goes on to cause errors in components and subsystems and ultimately in the system as a whole. Furthermore, the normal ageing process of the fluid causes performance losses that often result in system downtime. In order to prevent these time consuming and costly consequences, monitoring the condition of the operating fluid is of major significance.

If the cleanliness level is not monitored and efforts for improvement not made early enough, wear and tear can gradually reduce the system efficiency. Sometimes the system efficiency can fall by 20% before the machine operator even notices a problem. That is why preventative and predictive maintenance are so important.

At HYDAC, all our Industry 4.0-ready hydraulic systems are fitted with the latest sensor technology to create smart machines that are able to self-monitor, self-learn and self-correct. To build a smart system, you will require the following smart sensors:

- A contamination sensor (CS1000) for counting the number of particles in the oil and displaying the results according to the ISO class.
- A HYDAC Lab (HLB) sensor that continuously monitors the condition of the oil by measuring the temperature, water saturation, conductivity and change in dielectric constant — indicating changes in viscosity, mix or dilution, and possible oil deterioration.
- A condition sensor interface (CSI) to log the data collected by the sensors, and providing the two input channels needed for them.

HYDAC smart sensors have a HSI interface built in, therefore no configuration is necessary. The CSI instantly recognises the sensors and configures the display appropriately — a valuable plug-and-play feature. The CSI has also an output port for data transmission via a LAN cable and has an antenna that allows for wireless transmission via Wi-Fi. Users can access the data recorded on the system wirelessly using the HYDAC FluMoS mobile app, available as a free download from the Google Play Store.



The adaptation and installation of the condition monitoring package to any system is very easy. The steps are simple and are as follows:

- Install the contamination sensor and HYDAC Lab in the hydraulic line. Note that a 12–24 V power supply is needed.
- Connect the CSI with the HYDAC Lab and the contamination sensor.
- Connect the CSI to a power-conditioned outlet.
- Connect the network cable if the data is to be accessed directly on a PC or via a network.
- Download and open the FluMoS app onto an Android mobile device to access the data wirelessly.

In the FluMoS app, the user presses the Wi-Fi button to automatically connect the mobile device with the CSI. Once connected all the data recorded on the system will be accessible. The mobile device will display the following measurement outputs:

- Temperature
- Conductivity
- Water saturation
- Contamination level

The major benefits of implementing a preventative or predictive maintenance program are:

- Continuous monitoring of the machinery via the condition of the oil
- Early detection of defects and imminent damage
- Avoidance of unplanned machine and system downtime
- Increased availability, safety and productivity of systems
- Increases efficiency
- Cost savings over the lifecycle of the machine

Damage can always be prevented if appropriate steps are taken in due time and a smart system, as the one mentioned above, can help greatly to accomplish this task.

HYDAC International
www.hydac.com.au



OXYGEN ANALYSERS

Reliable oxygen measurement is just as important for controlling an optimised combustion process as it is for emissions monitoring. In one of the toughest applications of industrial process automation, the analyser must be easy to integrate and extremely resistant. Optimal combustion, however, relies on perfect dosing. Too little oxygen will result in incomplete combustion and, therefore, increased CO emissions. Too much oxygen, on the other hand, leads to very high heat loss via the exhaust gas.

The ZIRKOR series provides an oxygen reference value for emission measurement to act as a reference for the measurement results. There are three versions available: ZIRKOR100 for smaller plants, ZIRKOR200 for large combustion plants and ZIRKOR302 for adjustment without test gas.

The ZIRKOR100 is rugged due to its integrated cell diagnosis function, which keeps maintenance work to a minimum, with all important information being accessible via ZIRKOR Remote.

The ZIRKOR200 can work in ambient temperatures of up to 1600°C and calibrates itself automatically. Due to its variable probe lengths and a higher number of interfaces, it can be installed in all types of plants and applications, and is certified in accordance with EN 15267.

The main difference between ZIRKOR302 and the other two analysers is its automated calibration using ambient air. The tried-and-tested flow sensor principle does not require any test gases for this calibration and ensures a continuous, exceptionally precise measurement even at high temperatures. The analyser is available with an optional integrated measuring gas pump or an ejector powered by compressed air.

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Pepperl+Fuchs IDM 1D and 2D code handheld readers capture vital batch processes, recipe handling and procedure/operator validation, as well as assisting with the traceability of raw materials in batch and lot tracking in hazardous locations. The readers are available in a wired version or a wireless system.

The handheld readers are optimised for use with VisuNet operator workstations, such as the VisuNet GXP. The readers can also be used with a power supply in standalone applications. The entire reader range is certified for use in hazardous locations according to ATEX and IECEx Zone 1/2.

The 1D/2D code handheld readers offer a variety of benefits such as flexible connectivity with Bluetooth communication (distance up to 30 m) and an RS232/RS422 interface for long communication distances. The wireless scanners can be charged in hazard locations, and the battery is user-changeable. They also offer a wide variety of code support such as 1D barcodes and PDF417 as an option, as well as 2D codes, such as Data Matrix.

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SAFETY LASER SCANNER

The Leuze RSL 400 PROFI-safe safety laser scanner with Profinet interface offers simple integration into industrial networks. In addition to secure communication, this enables easy diagnostics and configuration via central access points.

The Profinet switch is integrated into the removable connection unit. This enables the replacement of a scanner without network interruption, thus increasing system availability. The connection unit has standardised connection technology with M12 connectors. Due to the lateral cable entry, the RSL 400 only needs a short installation height. Alternatively, AIDA-compliant connection models with push-pull connectors for copper and fibre-optic cables are available.

The integrated 2-port switch supports Profinet Conformance Class C and Isochronous Real Time communication (IRT). Consequently, the RSL 400 is suited in particular for use in line and ring topologies, as well as use in star topologies. Furthermore, it allows parallel access of standard and safety PLCs, whereby the data load can be minimised through the safety PLC.

Leuze electronic Pty Ltd

www.leuze.com.au



PANEL COMPUTER

The Aaeon ACP-1106 rugged all-in-one panel computer features a 10.1" widescreen 1280 x 800 pixel LCD display with a projected capacitive two finger multitouch screen making it suitable for operator panel and HMI control applications.

The ACP-1106 features a built-in computer based on the Intel Pentium N4200 or Celeron N3350 processors with up to 8 GB of DDR3L memory. It provides I/O connections for one COM port, one USB 2.0 port, two USB 3.0 ports, two Gigabit Ethernet ports, an external HDMI Video out and a two-pin terminal block for DC power. The ACP-1106 provides mini-card and I/O module expansion slots and an mSATA SSD hard drive slot for operating system and data storage.

The ACP-1106 is housed in an ultrathin aluminium chassis with an IP65 front bezel. VESA 75/100 mounting holes are also provided. It is compatible with Windows and Linux operating systems allowing it to support a wide range of off-the-shelf and custom-developed industrial and commercial applications.

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DATA LOGGERS

The ICP DAS DL-100-E and DL-101-E data logger devices can be used to record temperature, humidity and dewpoint information, including date and time stamps, and are able to store up to 600,000 downloadable records.

Real-time data on the DL-100-E and DL-101-E data loggers can be accessed by using the free Windows software, the iOS app or the Android app, as long as it is connected to the same local network the data logger is connected to. The data loggers support Modbus TCP, as well as the emerging machine-to-machine (M2M)/IoT (Internet of Things) connectivity protocol MQTT.

These data loggers can be connected using a range of communication interfaces including Ethernet and support PoE, meaning that the device can be easily integrated into existing HMI or SCADA systems, ensuring easy maintenance in a distributed control system.

The IP66 version of the DL-100-E and DL-101-E series is designed for industrial applications in harsh environments with IP66 grade protection approval rating. The rugged RJ45 ensures tight, robust connections and operation, even for applications that are subject to high vibration and shock.

ICP Electronics Australia Pty Ltd

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PoE SWITCHES

The latest 852 series of industrial Ethernet switches from WAGO feature PoE technology to enable the cables to carry both data and electrical power. This technology reduces the amount of cables need to connect to and from devices.

The switches are electronically efficient devices that are said to consume less energy and maintain a standardised power which keeps things simple and safe. They provide 30 W per channel, providing ample power for end devices, and come in both managed and unmanaged versions for flexibility of system design.

An operating temperature range of -40 to +70°C enables use in extreme environments, and the compact footprint makes them easy to install in any enclosure. PoE power comes from a centralised and universally compatible source, allowing for easy maintenance and backup from an uninterruptible power supply.

WAGO Pty Ltd

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ETHERNET PATCH PANELS

Ethernet patch panels enable a quick and easy connection between the field and control cabinet cabling. Eight DIN rail devices from Phoenix Contact provide various connection options. In the covered wiring space, IDC, push-in and screw connection technologies simplify the installation of the field cable.

The cable shielding is connected without tools with strain relief assured at the same time, saving time during installation. The optional surge protection protects the connected end devices, therefore increasing system availability. The additional shield current monitoring system enables valuable diagnostics. Any shield currents present, caused by different potentials or EMC, are indicated via an LED. Problems in the installation are indicated immediately, without the need for extensive measurements.

The range is complemented with 12 PoE injectors, which can supply remote Ethernet devices such as cameras with data and electricity via a shared cable. Along with these technologies, the devices are available with up to 60 W power and an electrically isolated power supply unit.

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THE FUTURE OF PRODUCTION INTRALOGISTICS

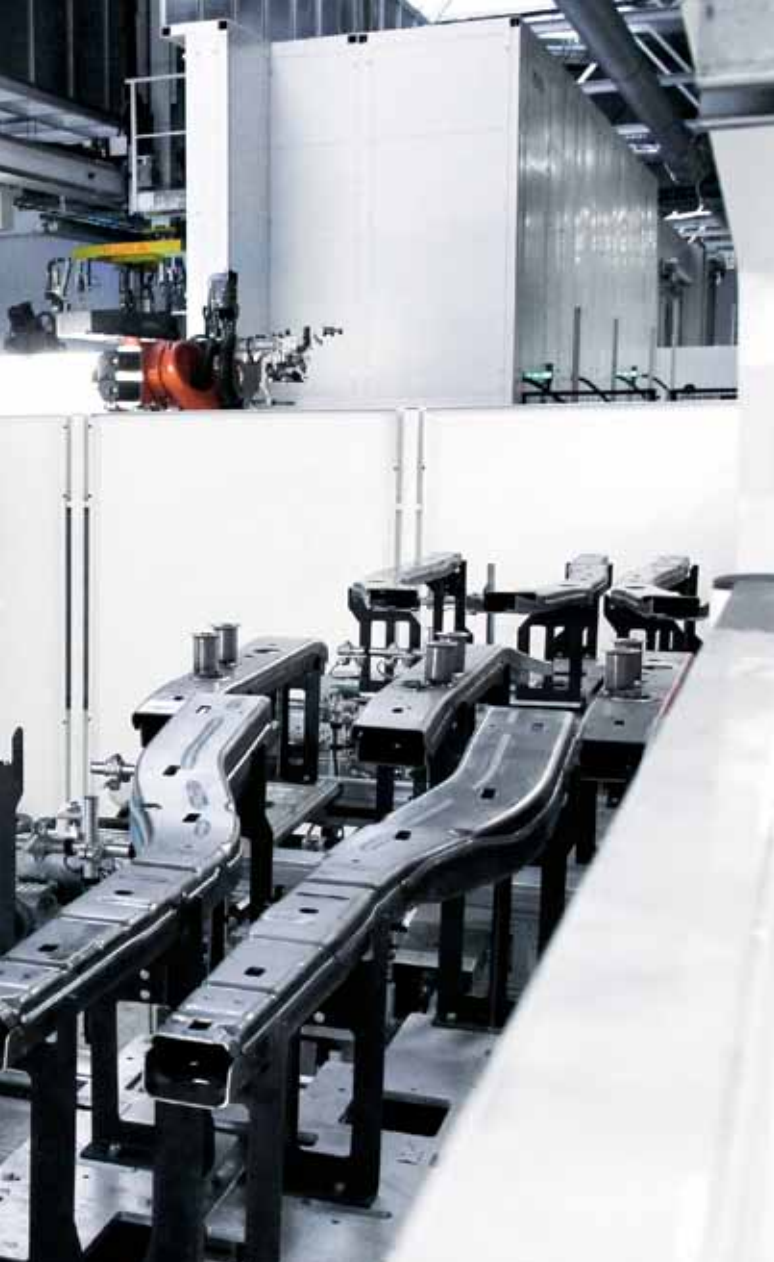
THE FINAL FRONTIER FOR MANUFACTURING OPTIMISATION

Technology, such as automated storage and retrieval systems and AGVs, can be applied as effectively to production intralogistics as to warehousing and distribution.

Manufacturing processes and technology look nothing today like they did 40 or 50 years ago. Automation has largely replaced manual processes, creating dramatic leaps in productivity, accuracy and throughput.

Yet the intralogistics processes that support manufacturing, in many cases, look exactly like they did 40 years ago. The processes for receiving, storing and transporting materials and parts to and from the various stages of manufacturing continue to use the same legacy systems and processes that have been in place for decades.

This is partly because manufacturing automation has been an all-consuming proposition for many organisations. With all available resources focused on manufacturing, production intralogistics processes were left behind.



FROM A SOLUTION PERSPECTIVE, THE TECHNOLOGY REQUIRED TO ADDRESS PRODUCTION INTRALOGISTICS INEFFICIENCIES MUST BE TAILORED TO THE MATERIALS, PROCESSES AND FACILITY OF A PARTICULAR MANUFACTURER.

processes are addressed, they have a range of proven material handling solutions available to them to enable:

- better process control upstream and downstream from production
- optimised inventory levels
- improved inventory visibility, control and traceability
- improved accuracy
- increased productivity
- maximised production capacity.

Gaining control of inventory and movement

From a solution perspective, the technology required to address production intralogistics inefficiencies must be tailored to the materials, processes and facility of a particular manufacturer. The solution may or may not be automation-centric; however, production intralogistics optimisation does require software that integrates with the manufacturing execution system to provide two key capabilities — positive inventory control and intelligent material flow.

Positive inventory control

Optimising production intralogistics, regardless of any other technology deployed, requires control of all inventory from receipt through storage and transport. Using software that has been proven in demanding material handling applications, manufacturers can achieve full, positive and transparent control of inventory through automated or manual processes.

Intelligent material flow

Many of the challenges associated with production intralogistics involve material movement. While part of the solution to this challenge may be automation, many issues can be addressed simply through software that provides intelligent control of material flow. By orchestrating the flow of materials to eliminate congestion while prioritising flows based on demand, production intralogistics software eliminates unnecessary or inefficient movements and increases the productivity of personnel and equipment supporting material movement.

Production intralogistics is essentially a warehousing and distribution operation that occurs within the manufacturing process, so it should come as no surprise that the same software that controls inventory and material flow in the modern warehouse can be applied to manufacturing.

Intelligent warehouse management systems provide an established and proven platform for production intralogistics. Additionally, a fully integrated and modular warehouse management platform allows users to only deploy the modules required to support current processes and technology, minimising the initial investment

In addition, until recently, the intralogistics solutions available for enhancing material control and movement were often expensive and inflexible. They were difficult to adapt to new model launches and product changeovers and therefore posed a business risk. Instead of making investments that might prove inflexible in the near future, production intralogistics systems in manufacturing were designed with an 'if it isn't broke, don't fix it' approach, trading off efficiency for flexibility.

But the production intralogistics process, if not technically 'broken', is highly inefficient. Manufacturers lack the visibility to effectively manage and control the inventory that manufacturing processes depend on. As a result, they are forced to compensate by overinvesting in production equipment and personnel and carrying excess inventory.

This waste of resources is becoming increasingly unacceptable in today's hypercompetitive, dynamic markets. Moreover, fundamental changes have occurred in materials handling technology: inflexible automation systems have been displaced by modular, flexible technology that is ideally suited to the challenges of production intralogistics. Today's warehouses and distribution centres routinely have full visibility into product as it moves through the warehouse.

As manufacturers face the reality that further investments in manufacturing automation will not pay dividends unless intralogistics

in production intralogistics. As needs change or new technology is deployed, additional modules can be added.

For example, the software can be installed today to manage manual storage and retrieval processes and then easily expanded to control automated storage and retrieval if the need for that technology is identified at a later date. State-of-the-art systems encompass inventory management, material flow and automation control in a single platform, while also providing an array of business intelligence tools that allow smart forecasting through real-time data analysis.

Flexible automation

While there are benefits to be realised from the positive inventory control and intelligent material flow management provided by the addition of a production intralogistics software platform, many environments will also benefit from the range of modular and flexible automation solutions currently available.

Automated storage and retrieval

Manufacturing environments that need to store materials on pallets can maximise throughput and storage density, while reducing energy consumption and keeping costs low, with pallet cranes and shuttle systems. Pallet shuttle systems provide efficient, automated storage and retrieval of up to 60% more pallets in the same space compared to manual systems.

For smaller-sized products, modular shuttle systems offer double- to quadruple-deep storage of totes, trays and cartons. Storage and retrieval vehicles are available with load-handling devices in either fixed or adjustable widths to handle different product sizes.

Managed by the software platform, these automated pallet, case, tray or tote storage and retrieval systems retrieve product quickly and efficiently based on manufacturing demand, dramatically increase storage density and support optimised transport.



Figure 1: Example of a pallet shuttle.



Figure 2: Example of a pallet conveyor system.

AGVs

Intelligent automated guided vehicles (AGVs) bring increased flexibility and efficiency to material transport. AGV systems automate workflows by executing transport tasks based on optimised and flexible strategies managed by the production intralogistics software.

They also provide the ultimate in flexibility and scalability. If additional manufacturing cells are required, more AGVs can be added to operate alongside those existing. They can be moved to another facility easily and one AGV can replace another during maintenance. Ideal for most types of material handling, AGVs safely and reliably fit into the manufacturing environment. With modern navigation options and customised load handling, they are efficient in highly complex logistics systems and simple A-B scenarios.

Goods-to-person storage, picking and kitting

Goods-to-person systems can be deployed to deliver materials or subassemblies to a manufacturing or kitting cell for further processing. These solutions are based on proven principles to boost efficiency, maximise storage space and make it virtually impossible to pick the wrong product.

Some systems provide better use of available space through a design that enables direct stacking of bins on top of each other and storage of multiple SKUs in a single bin, while employing mobile vehicles to deliver racks of products to manufacturing workstations. If the system is smart enough it will also learn over time which products have a higher rotation, storing them on the top layer to ensure faster picking times.

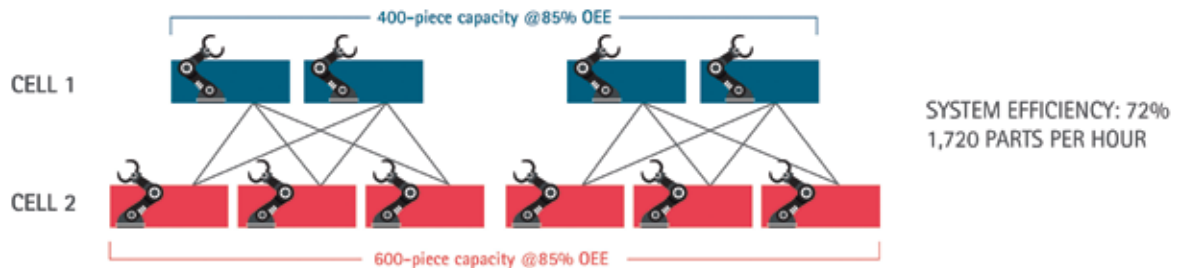
Case and pallet conveyors

A variety of conveyor systems are also available for use in production intralogistics. Multifunction pallet conveyors provide energy-efficient transportation of pallets with both light and heavy loads. They can be configured to meet a wide range of requirements and can carry loads up to 1500 kg.

Smaller conveyor systems can transport a wide range of small loads like totes, trays and cartons of up to 50 kg. These systems



TYPICAL MANUFACTURING PROCESS



PROCESS WITH INTELLIGENTLY MANAGED BUFFER CAPACITY

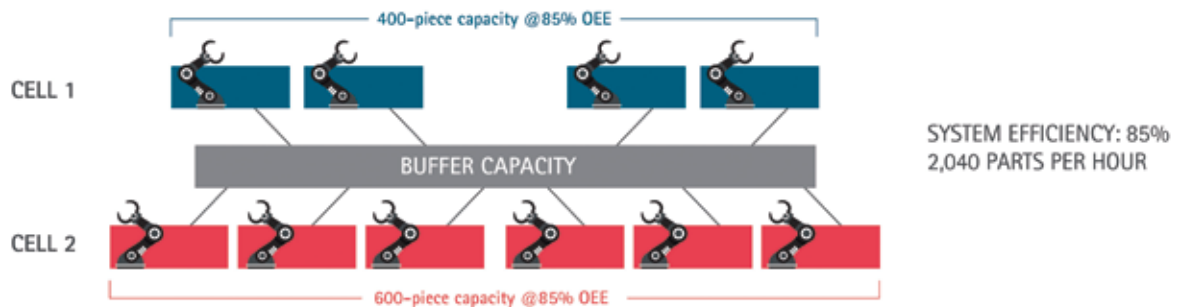


Figure 3: Decoupling improves efficiency between cells.

can be used to connect cells within the production environment and ensure smooth material flow between cells.

These proven materials handling solutions are all being deployed in production environments to manage materials and their movements. The software therefore needs to have the power to integrate these various components together to improve visibility and movement across multistage manufacturing operations.

Industry 4.0 capabilities

Production intralogistics will be an essential requirement for manufacturing organisations seeking to employ Industry 4.0 capabilities, such as decoupling and postponement.

Decoupling

Manufacturing processes today typically consist of multiple steps where subassemblies or components are assembled or produced in cells prior to final production. This allows machines to be staged to eliminate bottlenecks created by the slowest machines. However, truly optimising a cell-based process requires visibility into work in progress between cells to more effectively manage production at each stage.

For example, consider a two-stage process with a desired throughput of 2400 parts per hour. Machines in the first cell can produce 600 parts per hour and machines in the second cell 400. If all machines were operating at full productivity, the process would require four machines in the first stage and six in the second. However, equipment efficiency is typically closer to 85%. When you combine the efficiency of the two stages you get a combined efficiency of approximately 72%.

This drop in operational efficiency neutralises some of the cost savings that are realised through a cell-based manufacturing matrix. However, by using production intralogistics software to intelligently manage the buffer capacity between the two stages, the drop in efficiency can be eliminated. Operational efficiency is effectively increased from 72% to 85%, providing an ideal alternative to adding new machines when production capacity increases.



MANUFACTURERS MOVING TO PRODUCTION INTRALOGISTICS ARE CREATING COMPETITIVE ADVANTAGE BY REDUCING COSTS, INCREASING THROUGHPUT AND RESPONDING FASTER TO CHANGES IN MARKET DEMAND.

Postponement

Virtually every manufacturer desires to produce product based on actual market demand rather than projected demand. Postponement makes this possible. By using production intralogistics to stage some product in advance of final production or packaging, the manufacturer retains the flexibility to delay final production until orders have been received. This can greatly reduce waste, rework and markdowns while allowing a manufacturer to remain responsive to its customers.

Conclusion

The core competency of production intralogistics is to better manage movement and control of inventory between various production and manufacturing processes. The investments that have been made in manufacturing automation have paid dividends, but, in most cases, additional investments will have diminishing returns without addressing production intralogistics.

The technologies, in the form of intelligent material management software and flexible automation technologies, are available today to provide the positive inventory control and intelligent material management required to optimise inventory levels, productivity and production capacity. Manufacturers moving to production intralogistics are creating competitive advantage by reducing costs, increasing throughput and responding faster to changes in market demand.

Swisslog Australia
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MODULAR ETHERNET SWITCHES

The Hirschmann Dragon MACH4000 modular switch series features a high-density port count in a modular design and Hirschmann's HiOS operating system.

In addition to advanced hardware and software features, including up to four ports that can be set up for 2.5 Gbit Ethernet or 10 Gbit Ethernet, redundant power supplies and various updated interfaces, the DRAGON MACH4000 is said to be capable of handling current and future bandwidth needs without compromising on availability or performance.

These backbone switches are best suited to applications that require a stable, high bandwidth and reliable data transfer, including transportation and manufacturing, harsh industrial environments in oil and gas, as well as power transmission and distribution applications.

Control Logic Pty Ltd

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PHOTOELECTRIC SENSORS

All R10x and R20x sensors in all sensing modes have the same user interface. The intelligent combination of a multiturn potentiometer and push-button control enables intuitive adjustment of all functions and simplifies set-up.

The R10x and R20x series are designed to minimise complexity. Retroreflective, diffuse and measuring sensors alike have the same simple user interface and are configured the same way. In addition to the user interface, IO-Link can also be used for configuration. I-O Link and Smart Sensor Profiles increase efficiency and reduce the complexity of sensor integration.

Each R10x and R20x sensor offers several mounting patterns in one industry-standard housing style. Compatibility with a variety of common solutions on the market gives users the freedom to adapt to virtually any installation requirement. R20x sensors for longer-range sensing also feature rotatable connectors, which allows flexible installation, even in space-restricted applications.

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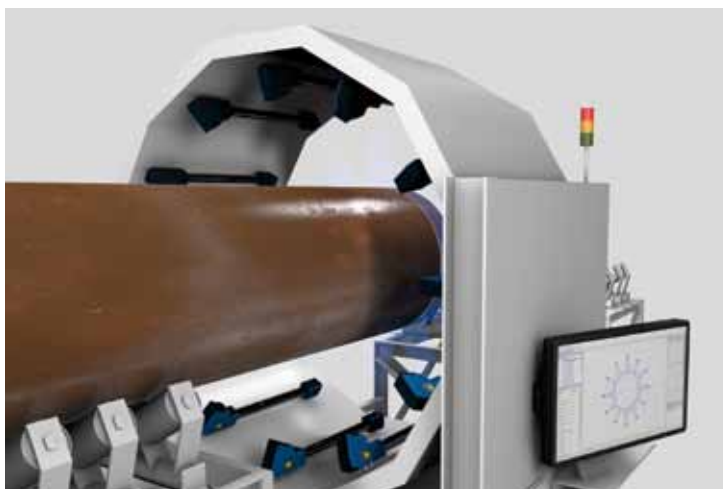
The Wenglor VisionApp 360 software makes it possible to combine individual output values (point clouds) from up to 16 sensors into a coordinate system. Comprehensive 360° images and recordings of 3D profiles can thus be implemented without any programming knowledge. Thanks to the convenient user interface, the sensors can be synchronised and calibrated by means of simple parameter configuration. This eliminates time-consuming and costly programming work for the user.

Objects to be measured can be circular, oval or angular — their surface characteristics play practically no role at all in this regard. They can be used for a diverse range of applications, for example, the software is used to measure the exact profiles of railway rails using four profile sensors at the same time, but the combination of 2D/3D sensors and VisionApp 360 software is also being used successfully for the precise measurement of tree trunks at sawmills, and in the automotive industry for measuring gaps between auto body parts.

The sensors can be set up in any desired arrangement. For example, they can be arranged next to each other in a circle or a line. A calibration layout with corners can be arranged freely for the application. Measured values are read out via a TCP interface as a combined point cloud which can then be processed with additional software tools in order to obtain the desired results.

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SAFE MONITORING OF PRESSURE PEAKS IN GAS- AND FLUID-FILLED PIPELINES

High pressure peaks in pipelines can reach catastrophic levels if not detected in time.

Pipelines filled with gases or liquids are an integral part of any industry. They are used for transporting and dispensing liquid, supplying compressed air, for hydraulics applications or for supplying water. Regardless of the application, they are not generally well-protected from dynamic pressure fluctuation caused by abrupt changes in flow rates, which can occur in normal operation.

Pressure surge is considered a 'time-bomb' as long as fluid-filled pipes are around. This was described in detail as early as the 1st century BCE by Marcus Vitruvius Pollio, a Roman architect, civil engineer and author. Problems of high pressure build-up in aqueduct construction were reported to occur in many of the finest examples of Roman architecture, such as those at Segovia and the Pont au Gard. In fact, they occur in all fluid pipelines systems and could potentially lead to pipeline fatigue and catastrophic failure.

The main cause of pressure surge originates from the sudden change of fluid velocity in the pipeline system. The root cause of this phenomenon generally arises from the normal operation of pumps and valves. It may also be due to expulsion of air from the piping system. Although these problems can be minimised through proper sizing and design of pumps and valves, they cannot be completely avoided, as it is impossible to close a valve at an infinitely slow rate to avoid any inertial effect. This is why installing a reliable monitoring system is important for early detection of pressure build-up to avoid potential catastrophe.

Sensors and pressure dampers are typically used to solve this issue. They may provide the operator with real-time operational data and immediate action can be taken when a problem arises, enabling them to minimise the impact of pressure surge. However, these methods are not capable of detecting and recording extreme pressure peaks. Overpressure peaks can arise in a matter of milliseconds, and can go undetected with such a monitoring system.

KELLER AG have developed a special digital manometer, LEO1, that is capable of recording pressure at a rate of 5000

readings per second. It is specifically designed to detect extreme pressure peaks with fine temporal resolution. The LEO 1 is a microprocessor-controlled, accurate and versatile pressure measuring instrument with the capability of measuring from -1 to 1000 bar with 200 mbar resolution. An optional intrinsically safe and ATEX-certified version of LEO1, LEO1 Ei, incorporates an additional protection switch for use in hazardous areas.

For additional recording capabilities, the high-resolution digital manometer, LEO5, is available. It can be easily adapted to application-specific measuring requirements due to its modular design. An optional Bluetooth interface is also available for pressure measurements in inaccessible or hard-to-access areas. With LoRa technology, this sensor is capable of connecting to the cloud and communicating real-time data for analytics. It also has a low power consumption and is optimised for IoT applications.

Having these devices in a monitoring system improves the safety of the overall site and minimises the possibility of catastrophic pipeline failures. They can also be used as early accident prevention devices, which are invaluable tools for maintenance. The pressure peak could indicate damaged machinery and notify the operators of early maintenance requirements. Their ability to integrate with LoRa technology for IoT applications further increases efficiency and productivity with minimum additional cost.

As the era of the IoT is approaching, the demand for sensors will continue to increase. Bestech Australia supply pressure sensors from KELLER AG in Australia and New Zealand, as well as industrial sensors for measuring a wide range of physical parameters such as displacement, temperature, force, load, torque, level, colour, angle, acceleration, motion and vibration. Bestech's factory-trained applications engineers can assist with providing sensor solutions for specific measurement requirements.

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The NORDAC BASE – SK 180E, is an ATEX-compliant, decentralised frequency inverter that allows for economical operation and also comes in protection class IP69K, for complete sealing of the housing, making it suitable for processing applications which require frequent high-pressure cleaning.

This inverter is specifically designed for simple applications and can be mounted (decentralised) outside a switch cabinet. The compact frequency inverter concentrates on the essential functions for pumps and conveyor technology.

The NORDAC BASE includes power ranges up to 2.2 kW and offers easy commissioning and operation. In addition, it is flexible with regards to accessories and function, and a number of communication interfaces make it compatible with all common bus systems.

The SK 180E is designed to control synchronous and asynchronous motors, and energy-efficient operation is possible due to its energy saving function for partial load operation.

It also comes with an integrated PLC, reducing the load on higher-level system control units and allowing for a modular plant design.

The SK 180E can also be modified for operation in explosive environments, depending on the area of application (conductive or non-conductive dust), and the modifications also include the replacement of the transparent diagnostic caps with a version made of aluminium and glass to allow for operation in a hazardous area.

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STAINLESS STEEL SAFETY SWITCH

Pilz has expanded its PSENmag range of non-contact, magnetic safety switches to include a stainless steel variant. The updated model reliably monitors safety gates and positions in harsh industrial environments up to 120°C. The robust stainless steel housing withstands extreme temperatures, impacts or vibrations.

The stainless steel housing of the stainless steel PSENmag offers minimal scope for deposits to form and is resistant to aggressive cleaning methods such as sterilising with hot steam. It offers protection level IP67/IP69K and can thus be used in areas with high contamination and high cleaning requirements.

It is available in two different versions: with cable or plug-in connection. For applications under extreme temperatures, the cable version is resistant to heat and cold for temperature ranges of -25 to 80°C. The plug-in version can be used up to 120°C.

The magnetic safety switch is vibration and shock resistant and has a high B10D value; and due to its compact dimensions, saves space and is easy to install.

Additional signal contacts and an integrated LED provide user-friendly diagnostics and rapid fault rectification.

Pilz Australia Industrial Automation LP

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SPECTROPHOTOMETER PROBE

The i::scan is a miniature multiparameter spectrophotometer probe for online water quality monitoring. With the ability to measure parameters such as colour, turbidity, DOC, UV254, TOC and COD, the product can be mounted in-line under pressure, flow through or immersion.

Depending on the water quality, the measurement windows of the unit need to be cleaned from time to time. This can be done automatically either by connecting pressurised air (in wastewater) or via a rotating brush (in clean waters).

The product is robust, using a high-tech polymer (PEEK) enclosure, sapphire windows and leak-resistant seals. It can be exposed to challenging waters including sea water, and due to its low power consumption it can be powered by solar panels or batteries.

Organic carbons are important to evaluate for water quality. Parameters like COD or DOC are an important part of the picture with respect to organic substrate, nutrition, pollution and treatability. In many cases, the interesting portion of the organics will be present in the dissolved form, thus invisible for a turbidity sensor. A spectrometric DOC sensor like the i::scan, however, responds to most of these organics, from wastewater to finished drinking water.

DCM Process Control Ltd

www.dcmprocesscontrol.com



MICROSCOPIC LENS FOR THERMAL IMAGING

With the release of the Microscopic lens from Micro Epsilon, monitoring the temperature of ultra-small objects is now possible. This feature is available to the already existing high-resolution thermal imaging cameras from Micro-Epsilon, the TIM640 and TIM 450 series. With this upgrade, these cameras are now capable of thermographic shooting of individual objects based on a spatial resolution of 28 μm .

This upgrade offers an advantage to the TIM640 and TIM450 series, which have display resolutions of 640 x 480 pixels and 382 x 288 pixels respectively. This addition further allows the camera to detect even the slightest temperature difference with high precision and reliability, such as that encountered in the electronics manufacturing industry. They are specifically designed for PCB temperature measurement, assembly monitoring or for the inspection of micro-sized solder and weld joints.

The camera also offers fast, real-time recording capabilities of 125 Hz. The camera can also be freely positioned within 100 mm of the targeted object. Due to the large working distance, taking measurements of electrical components during the electrical function tests is now possible. The microscopic lens is also capable of recording fast, transient temperature changes and recording radiometric videos and images.

The TIM camera is available with a scalable temperature range from -20 to 100°C, from 0 to 250°C and from 150 to 900°C, suited for a wide range of industrial applications. The process interface cable, high-quality tripod and TIMConnect software are also included in the package.

Bestech Australia Pty Ltd

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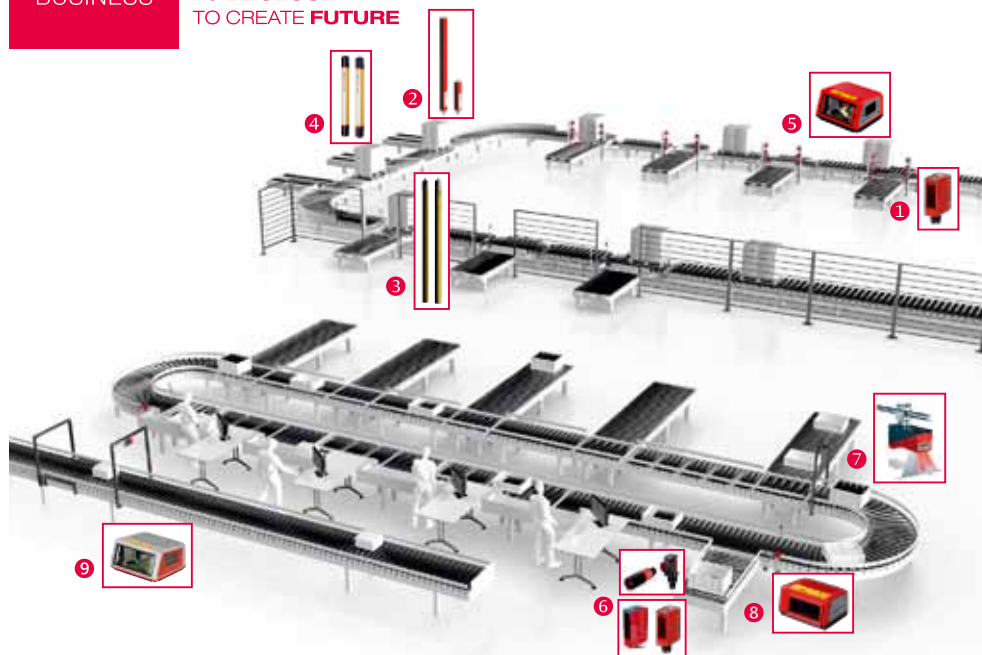


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ATEX-CERTIFIED CABLE GLANDS

The Pflitsch LevelEx cable gland is ATEX certified in the Ex-d and Ex-e classes. Its compact and slimline design facilitates a space-saving installation, and with only four components it can be simply and securely assembled. The sealing elements are of captive design and cannot be lost during assembly.

The LevelEx achieves IP66 or IP68 protection corresponding to that needed for flameproof enclosures (Ex-d) and increased safety (Ex-e).

LevelEx cable glands are available in sizes ranging from M16 to M63 and with NPT threads from 3/8 to 2 1/2". The cable gland bodies are made of galvanised brass and stainless steel, and cable diameters from 7 to 56 mm are securely sealed. With their broad operating temperature range of -60 to +130°C and ATEX and IECEx certifications, they can also be used under extreme environmental conditions.

During pressure resistance testing the LevelEx fulfilled the minimum requirement of 30 bar for 10 s. With a reference pressure of 20 bar and a temperature of -60°C, the Pflitsch ATEX certified cable gland can be used for a broad range of applications.

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STAINLESS STEEL COMPUTER DISPLAY

The AEX-119P stainless steel computer display is fully sealed to IP66, tested to meet ATEX Zone 2 standards and IECEx conformity for Class 1 Division 2 hazardous applications. The AEX-119P includes a 19" TFT LCD display featuring 1280 x 1024 resolution, 350 nits brightness and a projected capacitive touch screen with two-finger multitouch support. An optional sunlight-readable 1000 nits brightness display is also available.



All rear connections are routed through M12 waterproof connectors. The standard input connections provided include a VGA port, a USB Touch port and a 9-36 VDC power input. An external sealed on-screen display control box with a 3 m cable is also connected to the display via an M12 connector.

Housed in a 316 stainless steel enclosure with a true flat front bezel design that eliminates the build-up of dust and foreign material, the AEX-119P will not corrode and is easy to clean.

Designed to operate in temperatures ranging from -20°C to 60°C, the AEX-119P is suitable for mission-critical applications in harsh environments.

Interworld Electronics and Computer Industries

www.ieci.com.au



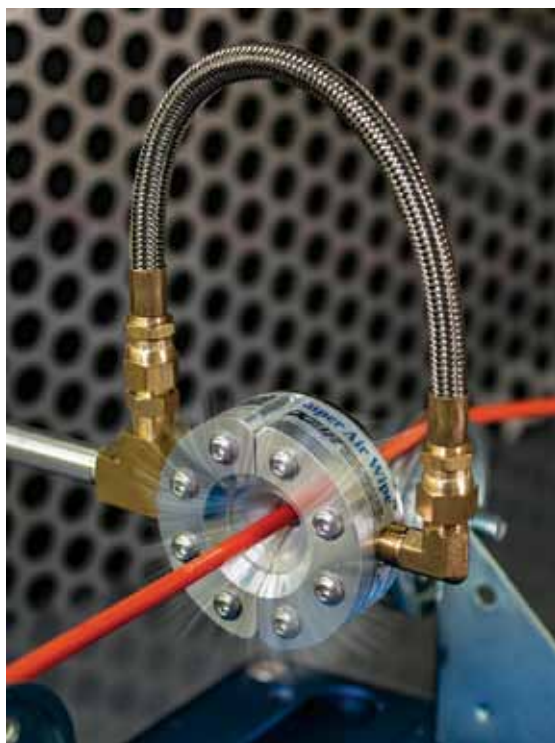
5-WIRE BRUSHLESS DC MOTOR

EC-I 30IE from maxon motor is a brushless DC motor that takes a turn away from the Swiss motor company's traditional designs. The EC-I 30IE motor features a 5-wire connection to simplify implementation and still give a wide functionality. An independent set speed value connection allows for a greater motor operating speed range over the common 2-wire approach to integrated brushless motor control. Additional features are a disable, direction and speed monitor output. It has an enclosed design that does not require any airflow through the body for cooling, which makes it suitable for harsh environments typical of the manufacturing industry.

Despite the internal motor control board, the motor has still been designed with a shaft on both ends of the body for orientation convenience and is still part of the modular construction program allowing the addition of ceramic planetary gearheads (reduction gearboxes). The motor is 30 mm diameter and 41 mm long including the control unit. It has 4-quadrant control, meaning it can control dynamic acceleration and deceleration in both directions. The controlled top speed is 6000 rpm from a 24 V supply and the 20 W power rating indicates a high power density ratio.

maxon motor Australia Pty Ltd

www.maxonmotor.com.au



PNEUMATIC CLEANING NOZZLE

EXAIR's 3/8" Super Air Wipe produces a 360° airstream that can blow off, dry, clean or cool the material passing through it. The split design can be clamped around continuously moving material such as wire, cable, pipe, hose and extruded shapes.

The Super Air Wipe ejects a small amount of compressed air through a thin slotted nozzle that pulls in high volumes of surrounding room air. The airflow uniformly ejects from the 360° of its inner diameter. Coupling brackets that hold each half of the Super Air Wipe together can be latched or removed quickly. Additional shims can be installed if more blowoff force is required. Air velocity can be varied with a pressure regulator and instant on/off control provides precision blowoff. Air consumption is 314 SLPM (11.1 SCFM) at 5.5 bar (80 psig) and the sound level is low at 82 dBA.

Super Air Wipes are CE compliant. They are available in aluminium and stainless steel in diameters from 3/8" (13 mm) up to 4" (102 mm). Large diameters up to 11" (279 mm) are available in aluminium. Applications include wiping wire, drying inks, cooling hot extruded shapes, and blowoff of water, plating, coatings and dust.

Compressed Air Australia Pty Ltd
www.caasafety.com.au



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OPTICAL MICROMETER

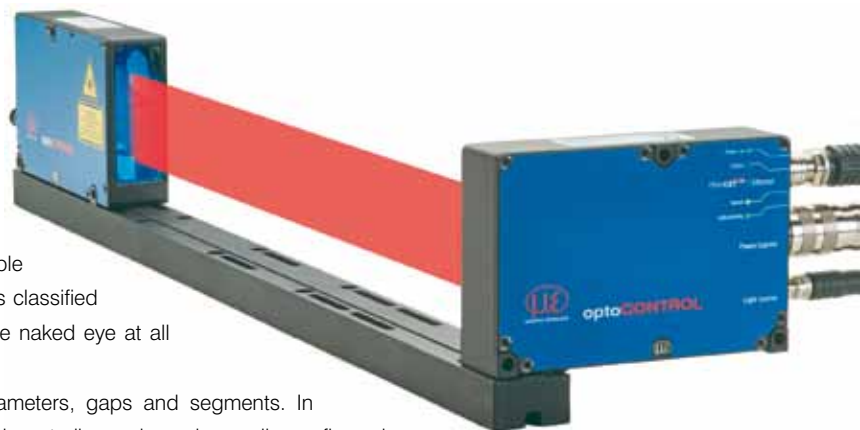
The optoCONTROL 2520-46(090) optical micrometer from Micro-Epsilon has a receiver that is able to rotate by 90°, making it suitable for installations in limited and restricted space. The laser strength is classified as class 1M, which is safe for observation through the pupil of the naked eye at all conditions except when passed through magnifying optics.

The micrometer is suitable for precision measurements of diameters, gaps and segments. In addition to the rotatable receiver, it also comes with an integrated controller and can be easily configured via a web interface. The laser can be easily switched off via the web interface and maintain measured values for a defined period of time. The system also offers features such as distance-independent measurements, multiresults output, measurement of up to eight segments, and the application of numerous averaging and filter types with measurement distances up to 2 m.

The sensor is said to offer high measurement accuracy at a maximum measuring range of 46 mm. The measured object can be placed at any position within the light curtain and the distance between the object and receiver is freely selectable.

Bestech Australia Pty Ltd

www.bestech.com.au



RUGGED TABLET PC

The Winmate M101S is a rugged tablet PC featuring a 7th Generation Intel Core i5 processor. Brightness of the 10.1" 1920 x 1200 touch screen has been increased to 800 nits, and wireless functionality has also been improved with 802.11 a/b/g/n/ac WLAN, as well as Bluetooth 4.2.

This rugged tablet PC includes a USB 3.0 type-C connector, which can function as a LAN or RS232 port as well as providing VGA video via an adapter, allowing versatile connectivity in a streamlined port. An 8 MP rear camera and dual microphones with noise cancellation are also included.

The M101S is IP65 certified (water- and dust-proof) and features MIL-STD-810G compliance for shock, vibration and drops from 1.3 m to ensure reliability on the job and in the field. It also offers an optional barcode or HF RFID reader, and has a hot-swappable battery design.

Backplane Systems Technology Pty Ltd

www.backplane.com.au

LOW-PROFILE FLEXIBLE SCREW CONVEYOR

Flexicon has released a low-profile flexible screw conveyor with an integral bin and castor-mounted frame that can roll below mezzanines and other low-headroom areas, receive material from overhead equipment, and discharge the material into process equipment and vessels throughout the plant.

Ready to plug in and run, the self-contained unit features a push-type drive system positioned at the lower intake end of the conveyor, as opposed to a standard pull-type drive positioned at the upper discharge end of the conveyor. This is said to reduce overall height by approximately 610 mm.

At 250 L, the integral bin accommodates the contents of approximately one-third of a bulk bag measuring 1 x 1 x 1 m, or several typical 25 kg bags, depending on bulk density. A specialised BEV-CON screw within the straight conveyor tube is engineered to move a range of difficult-to-convey bulk materials that tend to cake, pack, smear or plug, as well as fragile products prone to breakage, with no separation of blends.

With the exception of the polymer tube, all material contact surfaces are stainless steel finished to food, pharmaceutical, dairy or industrial standards for rapid washdown and corrosion resistance.

Flexicon Corporation (Aust) Pty Ltd

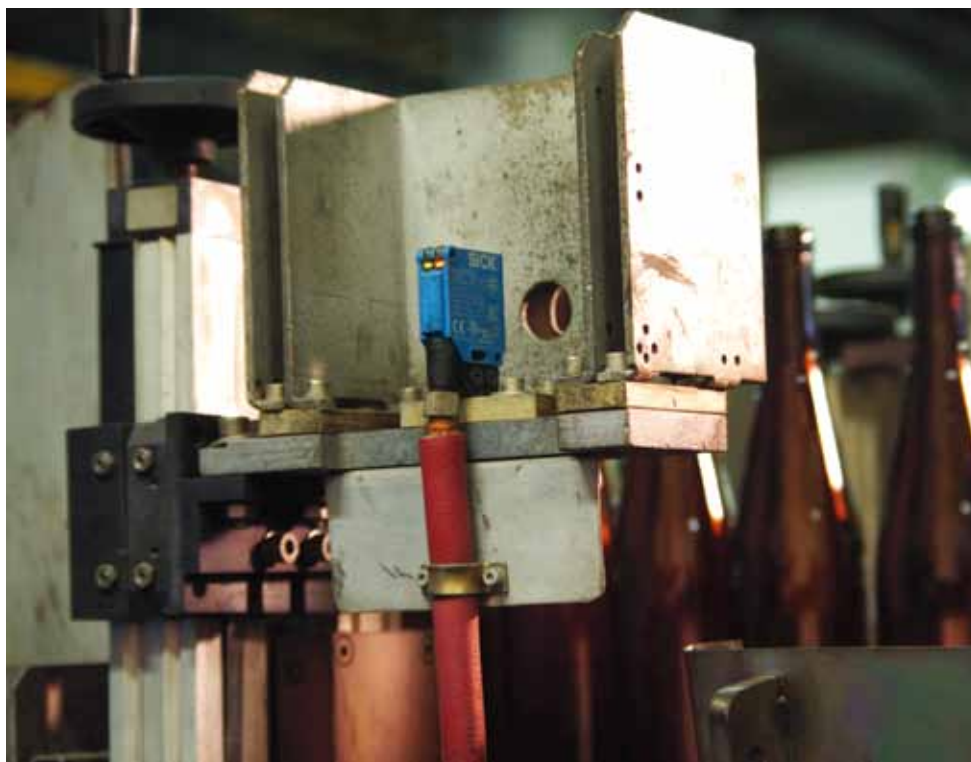
www.flexicon.com.au





Photoelectric sensors in a hot glass production line

With its slogan “We are Glass People”, Heye International GmbH from Obernkirchen in Germany has a leading global position in the field of services and systems for the container glass industry. The company, which has been part of the international Ardagh Group since 2003, manufactures machines and equipment for the efficient production of container glass under its HiPERFORM brand. Its HiSHIELD testing and inspection systems can be used with a wide variety of hollow glass containers, while its specialist HiTRUST services include project management, planning, designing and construction of new production facilities and improving the efficiency of existing processes. As a supplier of high-performance machinery and production optimisation and project management services, the company’s objective is to make glass the most successful packaging material in the world.



HiPERFORM machines are used at what is called the ‘hot end’ of container glass production. During peak periods, the machines can make more than one million bottles a day over three shifts at the fluid glass melt, which has a temperature of more than 1000°C. When the bottles are transported in a continuous flow to the next stage of production, they are still at temperatures of up to 650°C. This heats the air in the production area to over 120°C. The operating conditions of the sensors that count the bottles and monitor the flow are made even more difficult by contaminants and moisture in the air and the heavy vibration of the machines.

With these challenges in mind, the employees of the product development and production maintenance departments at Heye International evaluated several different sensor alternatives. Non-optical systems proved to be unsuitable because of their inadequate operating distance, inappropriate size, poor detection results and slow response times. There were also problems with optical sensors. Through-beam photoelectric sensors were rejected because they involve twice the amount of assembly and installation work for the senders and receivers. Photoelectric proximity sensors failed primarily as a result of their operating distance and the critical hot surface of the glass bottles.

The solution proved to be the SICK ClearSens WL12G-3 photoelectric sensor for transparent materials, combined with the SW50 high-temperature reflector. The sensor’s metal housing, which has an enclosure rating up to IP67, makes it highly mechanically rugged and resistant to a range of aggressive chemicals. It has a maximum

safe operating ambient temperature of 60°C. However, in long-term use at Heye International installed behind a heat shield, the sensors can withstand more than 80°C. With a sensing range in this application of 2 m, this auto-collimation sensor guarantees to provide a reliable detection function and, at the same time, has high operating reserves, for example, if a coating builds up on the sensor lens. The lens is made from scratch-proof PMMA (acrylic glass), which is resistant to chemicals and ageing.

The switching frequency of the photoelectric retro-reflective sensor is 1500 Hz, which ensures that the individual bottles in the transport flow are detected and counted reliably. This is where the reflector comes in. It is installed on the other side of the flow of bottles from the sensor, where the temperatures are also high. Standard plastic reflectors would melt and become deformed after only a short time because of the intense heat. This does not present a problem for the SW50 reflectors since they have a pane of borosilicate glass mounted in an anodised aluminium frame which allows them to withstand temperatures up to 300°C over long periods. As a result of their past experiences, the team at Heye International also put a great deal of importance on the ease of use of the sensor. The bottle and container glass machines are in operation around the clock. For this reason, it is essential that the sensors can be operated during the third shift when there is no maintenance engineer available.

SICK Pty Ltd
www.sick.com.au

DEWPOINT TRANSMITTER



Michell Instruments has introduced an updated version of its 2-wire Easidew dewpoint transmitter, with a simultaneous analog and digital Modbus RTU output and a rugged 5-pin M12 electrical connection. Designed for dewpoint measurements in harsh industrial applications, the Easidew moisture transmitter is also easy to maintain with

live diagnostics and, when purchased with the Michell Calibration Exchange Programme, offers lifetime warranty.

All Easidew variants have a dewpoint measurement range of up to -110 to +20°Cdp. A range of process and electrical connections and the 4–20 mA output mean that the transmitter can be installed quickly and economically, and safely replace dewpoint sensors of other makes. As well as the M12 5-pin electrical connector, a mini DIN 43650 form C connection is also available. The process connections available are 5/8" UNF, 3/4" UNF and G 1/3" BSP, which makes it easy to adapt to local industry standards around the world. The PC-based configuration and diagnostic tool makes it easy for maintenance engineers to monitor the performance of installed transmitters on-site.

The Easidew dewpoint transmitter is the core part of Michell's Sensor Exchange Programme which ensures minimum downtime for users. Customers place an order for a guaranteed, reconditioned sensor. When this arrives, they exchange it for the installed moisture sensor that is returned to Michell resulting in zero downtime for the user.

Where full calibration traceability is required, Michell offers a recalibration service.

AMS Instrumentation & Calibration Pty Ltd

www.ams-ic.com.au



POTENTIAL DISTRIBUTION SYSTEM

The Phoenix Contact PTFIX potential distribution system is now available with a 4 mm² push-in connection. The blocks can be combined and mounted individually. The types vary between 6, 12 and 18 connections, which are available in 11 different colours. In addition to the classic DIN rail mounting on NS 15 and NS 35, flange adapters are available for direct mounting and there are universal adhesive mounting variants.

Other features include the electrically connected 2.5 mm² blocks that enable a high level of customisation for mounting. These elements with two positions are the smallest possible unit. They can be combined with each other and with all other block types within the nominal cross-section.

Using the web-based PTFIX configurator, products are easily created with the desired properties relating to the number of positions, mounting option, colour and marking.

Phoenix Contact Pty Ltd

www.phoenixcontact.com.au



MINIATURE DEVICE SERVERS

The ICP DAS tDS-724i and tDS-734i tiny device servers with PoE offer an isolated RS485 and either one or two isolated RS232 ports.

The tDS-724i/734i serial-to-ethernet device servers are designed to add Ethernet and internet connectivity to any RS232/485 device, and to eliminate the cable length limitation of legacy serial communication.

The VxComm Driver/Utility supports the most popular operating system, including 32- and 64-bit Windows 10/8/7/2008/2003/XP. The utility provides an easy configuration interface that can be used to quickly create and map virtual COM ports to one or several tDS-700 series modules. In addition, the utility contains a built-in terminal program, so users can send and receive commands and data via the terminal program for basic testing.

By using the VxComm Driver/Utility, the built-in COM port of the tDS-724i/734i can be virtualised to a standard PC COM port in Windows. Users can transparently access or monitor serial devices over the internet or locally via Ethernet without software modification.

These devices also offer 3000 VDC isolation and a ±4 kV ESD protection component that diverts the potentially damaging charge away from sensitive circuits to protect the modules and equipment.

ICP Electronics Australia Pty Ltd

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AS I SEE IT



THE CHALLENGES OF HIRING AN APPRENTICE INSTRUMENT TECHNICIAN

Several times now, at AMS, we have tried to employ an apprentice. Each time there have been difficulties.

I doubt whether most applicants understand what an instrument technician does. Most trades are well known: young people can see direct evidence of what they may expect in their day-to-day life as a carpenter, bricklayer, plumber, mechanic or electrician. Currently, of the traditional trades, an electrician is generally considered to be most closely aligned with instrumentation, unlike years ago when instrumentation was a standalone trade. The electrical aspect is only half the picture though. To me, the combination of electrical, pneumatics and mechanical influences makes instrumentation one of the most interesting and diverse trades around, but I've had years of experience. A school leaver is unlikely to have had access to an industrial site or be able to visually identify a valve or transmitter, so they don't have an innate understanding of what the trade represents. How can we expect them to know whether they want to work with instrumentation when they don't know what it is? Instrumentation has an image problem — in that it's almost invisible outside of our own circle.

Then there's reviewing résumés. As new entries into the workforce, apprentices are always going to be something of a gamble. Their résumé is always going to be light on relevant experience. Obviously this isn't the applicant's fault: everyone needs to start somewhere. We need to look for signs that the applicant will be reliable: previous part-time work or finishing high school can be an indicator towards reliability, and evidence of extra-curricular activities can help too. But ultimately, it's a bit of blindfolded dart throw.

Then there's the interview process: I'm convinced that a fraction of the ap-

plicants are purely crossing off numbers for Centrelink. As a jobseeker, demonstrating you're actively looking for work is a requirement to avoid demerit points that can ultimately result in being cut off from receiving benefits. Some applicants make the appointment for an interview but don't bother to show up or even notify you they won't be attending. Any interviewer will tell you this leaves a bad taste in the mouth. The time taken to review résumés, contact applicants and set aside a time and place for the interview adds up. Sometimes other staff are involved in the interview process, further adding to the cost.

Years ago there were technical colleges which could funnel students towards a trade for future employment, and then governments of the day became obsessed with pushing everyone towards university. The secondary education system was restructured so that 'techs' became a thing of the past. In my view, governments need to wake up and understand that not everybody is geared to go to university. Many would prefer a hands-on profession. We often hear in the news there is a shortage of tradespeople and the ones that exist charge too much. Increasing the number of tradespeople will balance a lot of these issues out.



After studying electrical engineering and accountancy, Tom Kuiper joined AMS. Over 15 years later he is the National Sales Manager. As AMS sells

a broad selection of process equipment, he has been exposed to a wide range of applications and industries.



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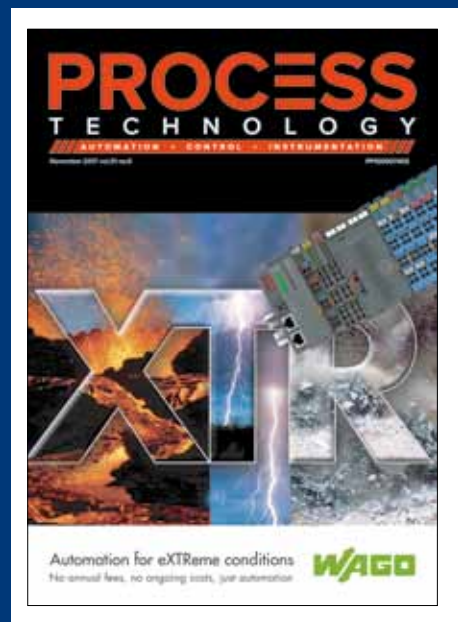
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