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welcome



Few ideas in industrial automation have generated as much excitement, and as much uncertainty, as generative AI. As the technology moves from the lab to the plant floor, the question is no longer whether it will reshape operations, but how. This issue explores the latest developments in generative industrial AI and what they mean for engineers, operators and business leaders navigating this shift.

Of course, even the smartest software depends on hardware that keeps running. Rotating assets such as motors and pumps remain the workhorses of so many plants, and their failures can be very expensive. We examine four of the most common causes of rotating asset failure and, more importantly, the practical steps you can take to prevent them before an unplanned outage hits your bottom line.

Speaking of the bottom line, operating expenditure continues to command. A feature on reducing OPEX tackles a perennial design question: pneumatic or electric actuation? Each technology has its strengths, and the right choice depends on the application. We explore when each is appropriate, so you can weigh upfront cost against long-term energy use, maintenance and performance.

Finally, in our Tech Tips this month, we turn to a challenge familiar to anyone who has commissioned or maintained a fieldbus system. Testing Profinet I/O devices traditionally calls for a dedicated PLC, which is not always available or convenient. This article shows how to verify device behaviour with a Windows PC, saving time during development, commissioning and troubleshooting.

Together, these pieces reflect the dual pressures facing industry: embracing innovation while sustaining the reliability and efficiency that production depends on. Whether you are evaluating emerging AI tools or fine-tuning the fundamentals, we hope you find ideas here that you can put to work right away.

I hope you enjoy the issue.

Glenn Johnson
Editor
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High speed rail offers new manufacturing opportunities in NSW

The Australian Government has announced it has started the process to develop a hi-tech advanced manufacturing facility (AMF) in Newcastle to support high-speed rail.

The federal government's High Speed Rail Authority says the AMF will bring together advanced manufacturing, technology and precision engineering to produce the majority of the construction elements needed for the Newcastle to Sydney High Speed Rail project, which is in the development phase.

The High Speed Rail Authority has called for expressions of interest to develop the AMF, and a search for land near the proposed rail corridor. The authority says the AMF represents an opportunity to change how Australia delivers major infrastructure, manufacturing repeatable components in a controlled environment to achieve quality and consistency, reduce waste, support safer workplaces and provide greater certainty over cost and delivery.

The facility's goals extend beyond supplying components for the railway: the AMF can support stronger domestic supply chains and help develop skills and expertise that can strengthen other parts of Australia's infrastructure and manufacturing sectors.

The AMF will also help create new career opportunities for people in areas like the Hunter Valley who have been affected by job changes caused by the energy transition.



DroneShield awarded lucrative US defence contract

Australian counter-drone technology company DroneShield has announced it has been awarded an Indefinite Delivery, Indefinite Quantity (IDIQ) contract for the US Department of Defense. The contract will support the Joint Interagency Task Force 401 (JIATF-401)'s Domestic Shield initiative, with a maximum contract value of up to US\$500 million over three years.

The award establishes a streamlined procurement pathway for DroneShield's counter-UAS capabilities to support Domestic Shield requirements and the rapid fielding of technology to protect defence-critical infrastructure and other high-priority locations across the United States.

Domestic Shield is a JIATF-401 initiative focused on accelerating the deployment of counter-UAS capabilities in response to the rapidly evolving threat posed by unmanned aircraft systems (sUAS).

"Defending against small UAS threats is an immediate homeland defence requirement, and rapidly fielding proven technology is critical to the mission," said Nate Webb, Director of Strategic Partnerships at DroneShield. "DroneShield continues to offer field-proven capabilities while investing in next-generation technology designed to evolve with the threat. This award provides a streamlined pathway to deliver those capabilities to end users who need them."

Agreement reached on the future of Bell Bay Aluminium

Rio Tinto, the Tasmanian Government and the Australian Government have reached agreement to secure the ongoing operation of Bell Bay Aluminium in northern Tasmania through to the end of 2031. Under the arrangements, Hydro Tasmania will continue supplying electricity to Bell Bay Aluminium until 31 December 2031, and the Australian and Tasmanian Governments will provide additional support to continue operations as Tasmania's energy system evolves.

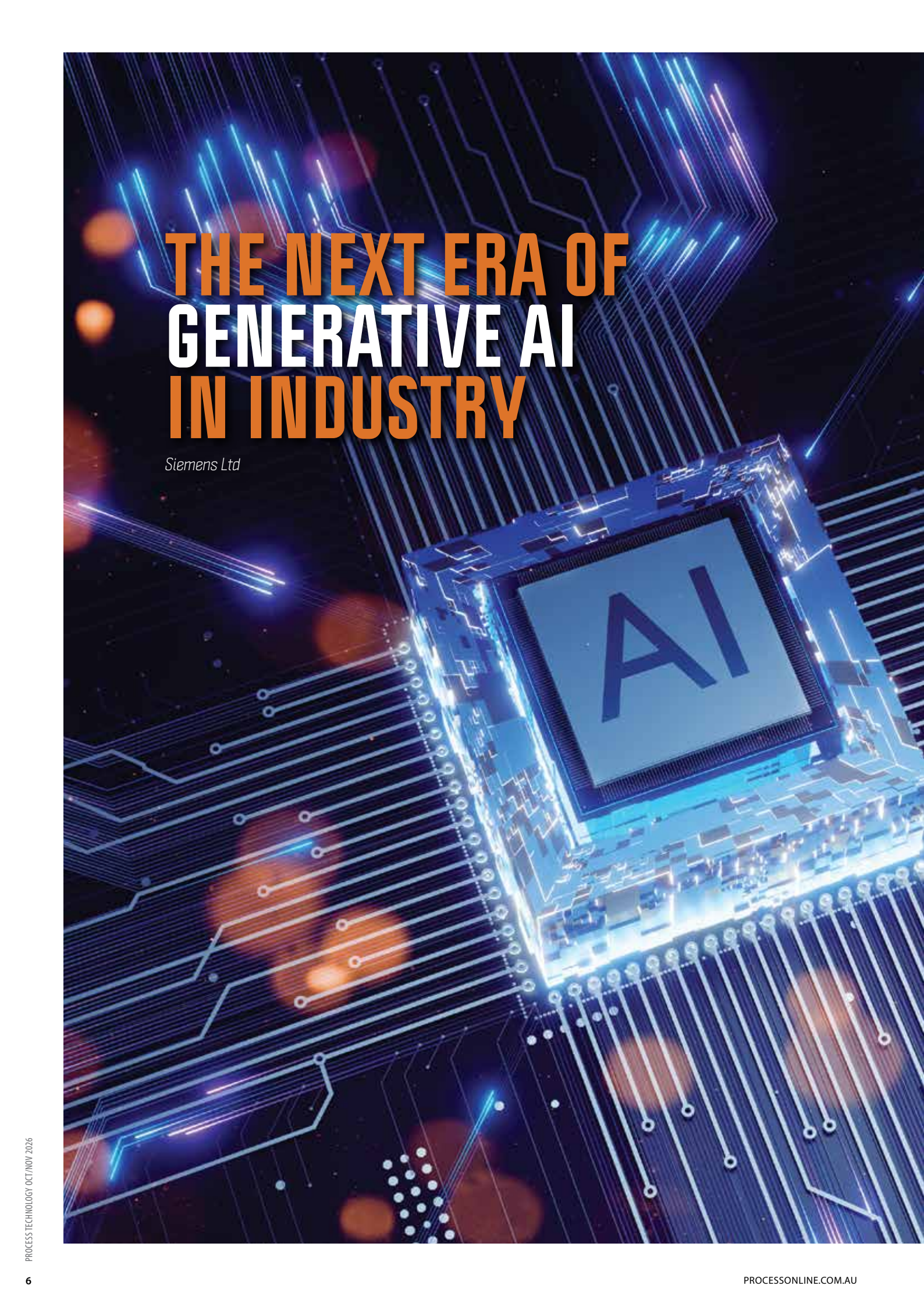
Rio Tinto says the additional support will help maintain Bell Bay Aluminium's international competitiveness and its ongoing contribution to the Tasmanian economy.

"These agreements will provide Bell Bay Aluminium with an operating pathway through to 2031, and increased certainty for our people, suppliers and the northern Tasmanian community," said Rio Tinto Aluminium & Lithium Chief Executive Jérôme Péresse. "Bell Bay Aluminium has been part of Tasmania's heritage for 71 years, and we are proud of the jobs, exports and economic value it creates for the state.

"With these agreements in place, we can continue to safely deliver high-quality aluminium products for our customers in Australia and around the world. I would like to thank the Tasmanian and Australian Governments, Hydro Tasmania, our workers and everyone else who contributed to securing this outcome."

Bell Bay Aluminium is 100% owned by Rio Tinto and began operating in 1955. It was the first aluminium smelter in the Southern Hemisphere and produces about 190,000 tonnes of aluminium a year.



The background is a dark, futuristic digital space filled with glowing blue and orange circuit lines and data streams. In the lower right, a large, detailed AI chip is shown, with the letters 'AI' prominently displayed on its surface. The overall aesthetic is high-tech and industrial.

THE NEXT ERA OF GENERATIVE AI IN INDUSTRY

Siemens Ltd

Exploring developments in generative industrial AI and their implications for industry.

AI has delivered tremendous value for industry over the past few years. Innovations in machine learning and neural networks enabled solutions like predictive maintenance or generative design. However, with the recent breakthrough in generative AI new opportunities emerged, which — beyond all the hype and excitement — are delivering real value to industries.

With industrial copilots, domain know-how in industries plagued by a lack of skilled labour is being democratised and AI-powered human-machine interfaces are making technology more accessible. Additionally, large language models (LLMs) are playing a transformative role in industrial applications by acting as 'translators' between APIs. This capability simplifies communication and integration across diverse tools and systems, breaking down silos and enabling more efficient workflows.

At the same time, there are many obstacles that need to be overcome. For example, the data hunger of LLMs cannot be satisfied as long as data sovereignty and trust between partners remain unresolved. Developments are therefore fragile and difficult to predict.

THE EVOLUTION OF INDUSTRIAL GENERATIVE AI: KEY TRENDS

Industrial foundation models

Industrial foundation models are pre-trained on industry-specific data, enabling faster and more accurate deployment of AI solutions. They provide a standardised starting point, saving time, resources and energy due to scaling effects. The models capture industry complexities, leading to informed decision-making. They also facilitate knowledge transfer and collaboration across sectors.

What this means is that an industrial foundation model is trained on the 'language of engineering' and goes beyond typical LLMs. It supports not only text and images but also 3D models, 2D drawings and other complex structures like time-series data specific to industry.

Tailoring AI solutions to industry needs improves efficiency and performance. However, challenges include data availability and privacy concerns. Industrial partners need to team up and share use cases and their specific training data — so trust is essential here.

Agentic AI

Agentic AI, especially in combination with generative AI, will be a game changer. Agentic AI refers to the use of AI systems that possess a certain level of autonomy and decision-making capabilities in the industrial context. These AI systems are designed to act as agents, performing tasks and making decisions on behalf of human operators or organisations.

Agentic AI in the industrial context involves deploying AI systems that can independently monitor, analyse and control various aspects of industrial operations, such as predictive maintenance, quality control, inventory management or optimisation of production processes. By leveraging agentic AI, industries can benefit from increased efficiency, reduced costs, improved safety and enhanced decision-making capabilities.

>>

Generative AI combined with agents will change the way we engineer and design. AI will take over more tasks that were previously done by humans, such as designing a specific element or product. With agents, we will first simulate and optimise the process, then derive the parameters for the factory or plant, and then design the system, which will then be built.

A common marketplace (an Agentic Economy) will form where agents can be ordered or bought. Agents will also need to be able to search for other agents in such stores, so a standard for agents and their meta-description may become important. Agents will also have the ability to pay for third-party services. At some point, you will have a network of agents, orchestrated and controlled by a 'master agent'.

End-to-end quality management across multiple agents is one of the biggest challenges, however. This is especially true when an agent economy is established that combines a wide variety of agents from different companies.

Multimodal LLMs

Multimodal LLMs represent an exciting trend in AI, enhancing language processing, improving computer vision and enabling machines to better interact with the real world. They combine language understanding with visual perception. These models process data from text, images and videos to gain a deeper understanding. They can generate accurate descriptions, analyse visual data with textual information and enhance natural language understanding.

Multimodal LLMs have applications in computer vision, autonomous vehicles and robotics. They improve object recognition and scene understanding, and enable machines to follow complex instructions. Multimodal LLMs have the potential to revolutionise the processing and generation of industry-specific data such as time series, 2D and 3D models or machine vision in the same way that conventional LLMs have revolutionised text and speech processing.

Challenges include acquiring and labelling multimodal datasets and addressing biases. A good approach would be to pre-train multimodal LLMs to the extent that the local effort required by the end user remains low. This increases acceptance and safety and enables faster scaling.

Edge models

Industrial edge architectures represent a growing trend in the field of AI, and



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involve the deployment of AI algorithms and processing power at the edge of industrial networks — in closer proximity to the data source. This approach facilitates real-time data analysis, decision-making and automation, thereby reducing reliance on cloud-based processing. It addresses latency and bandwidth limitations, enabling industrial systems to respond promptly to critical events and make timely decisions.

This approach also enhances trustworthiness and cybersecurity by keeping sensitive data and AI algorithms within the local network. Additionally, it offers cost savings by reducing the need for continuous cloud connectivity and associated data transfer costs.

However, the decision to adopt industrial edge AI depends on factors such as algorithm complexity, data volume and the need for centralised monitoring and control. Achieving a balance between edge and cloud computing is crucial for ensuring optimal performance and scalability.

Specialised hardware

Specialised hardware — like GPU-enabled or language processing unit (LPU)-enabled edge devices — is an emerging trend in industrial AI. These devices provide high-performance computing power at the edge, enabling real-time processing of AI algorithms. GPU and LPU integration allow for parallel processing and accelerated performance, resulting in faster execution



INDUSTRIAL FOUNDATION MODELS ARE PRE-TRAINED ON INDUSTRY-SPECIFIC DATA, ENABLING FASTER AND MORE ACCURATE DEPLOYMENT OF AI SOLUTIONS.

of complex AI tasks. This local processing reduces latency and reliance on cloud resources, making it crucial for time-sensitive applications.

Specialised hardware also supports more advanced AI models, leading to enhanced insights and improved performance. However, careful consideration is needed for factors like power consumption, scalability, and compatibility with existing systems to ensure seamless integration and optimal performance.

THE IMPACT: FUTURE SCENARIOS

Scenario 1: From assistance systems to autonomous systems

In the future, industrial AI will experience a significant transformation, shifting from assistance and recommendation systems to an increasing number of more autonomous systems in the realm of industrial automation. This trend is expected to extend to the automation domain in the next five years, as experts foresee the need for more autonomy in factories due to a lack of skilled labour. Advanced task-planning systems are likely to play a crucial role in this transformation.



In manufacturing, autonomous robots will have taken over repetitive and labour-intensive tasks on the assembly line. These robots work collaboratively with humans, seamlessly integrating into production processes. Equipped with advanced AI algorithms, they can analyse data in real time, make decisions and adapt to changing production demands. This level of automation could drastically improve efficiency, productivity and product quality.

The logistics sector has already witnessed a revolution through the implementation of autonomous systems. Smart robots navigate autonomously through warehouses, retrieving and delivering goods with precision. They optimise inventory placement, track stock levels and streamline order fulfilment processes. As a result, order processing has become faster, errors have been reduced and customer satisfaction has improved.

In industries such as energy and utilities, autonomous systems play a crucial role in monitoring and controlling complex infrastructure. AI-powered systems continuously analyse data from sensors, predict maintenance needs and can automatically schedule repairs or adjustments. This proactive approach to maintenance ensures the smooth operation of critical systems and minimises downtime.

Besides providing support at individual steps in existing workflows, next-generation industrial generative AI solutions are expected

to enable shortcuts in the workflow process, spanning multiple individual tasks, from intent to outcome. This advancement will further enhance productivity and efficiency in industrial processes.

The rise of autonomous systems in industrial automation has led to increased productivity, cost savings and improved safety. These advancements bring us closer to the progress levels projected by economists for a world filled with autonomous systems, compensating for the limitations of human labour.

However, it is crucial to also address the challenges of potential job displacement and ethical considerations that arise from this transition. It must be clear that AI is not intended to replace humans, but to support them. Less challenging, less complex tasks can be handled by AI, leaving humans to focus on tasks that require deeper understanding and creativity. Careful planning and management are necessary to ensure a smooth integration of autonomous systems while addressing these concerns.

Scenario 2: Autonomous industrial AI for flexible, customised and high-speed processes

Autonomous industrial AI has the potential to transform production processes, outperforming human intervention in terms of speed and flexibility. These intelligent systems can analyse vast amounts of data in real time, enabling split-second decisions to optimise operations.

However, achieving this level of automation requires trust in AI's performance. Manufacturers must have confidence in the accuracy and reliability of AI algorithms to delegate control. By placing trust in AI, businesses can unlock the full potential of speed, flexibility and efficiency.

As AI capabilities evolve beyond our current understanding and experience, the importance of human involvement will diminish, with the extent of autonomy granted to AI systems determining the possibilities. The key question is whether we will limit what is achievable, or whether we will embrace the realm beyond our current understanding.

MASTERING THE NEW ERA OF GENERATIVE AI: A HOLISTIC STRATEGY

To ensure readiness for the advancements and challenges of industrial AI in 2030, it is essential that stakeholders adopt



INDUSTRIAL EDGE ARCHITECTURES REPRESENT A GROWING TREND IN THE FIELD OF AI, AND INVOLVE THE DEPLOYMENT OF AI ALGORITHMS AND PROCESSING POWER AT THE EDGE OF INDUSTRIAL NETWORKS.

a comprehensive strategic approach, incorporating a number of key elements.

General considerations include:

- **Fostering a culture of innovation within the organisation that embraces AI technology:** This can be achieved by promoting collaboration, providing training and resources for employees to upskill in AI-related areas, and fostering an environment that encourages experimentation and learning from failures.
- **Exploring which processes can benefit most from the power of AI:** Increasing efficiency, reducing material and energy consumption and shortening lead times are also key to achieving sustainability goals.
- **Remembering that industrial AI differs significantly from end-user AI:** It must meet the rigorous requirements and standards of industrial environments, with cybersecurity, harm reduction, legal compliance and the mitigation of bias in training data ensured through binding standards and rules.

To fully take advantage of the future of industrial AI, organisations must enable an industrial ecosystem-centric approach. What is true for digitalisation is all the more true for AI: no one can do it alone. True creativity and value creation can only happen in a space where partners, customers, vendors, developers and experts come together to explore and develop best-in-class solutions.

We must remember that industrial AI can only be as good as its training data, and that it benefits from collaboration and co-creation. The old ways of protecting data to realise your interests (such as intellectual property) will change in the long run — in the emerging age of AI, those who share their data with partners, customers and experts in the best way will be the ones that succeed.



Industrial robot installations hit five million in 2025: report

According to a recent review by the International Federation of Robotics, the global operational stock of industrial robots surged 9% to a record 5 million units in 2025. This was driven by an 11% jump in annual installations, with factories worldwide installed more than 600,000 new units over the year.

"Industrial automation is progressing at high speed," said Jane Heffner, President of the International Federation of Robotics. "The new mark of five million robots operational in factories worldwide is more than double the number seven years ago. The strongest growth is taking place in Asia, followed by Americas, while Europe is moving ahead more slowly."

China has further strengthened its position as the world leader in robot adoption. Annual installations grew by 20% year-on-year and now account for 59% of global deployments. The latest figures show that 354,000 industrial robots have been installed in 2025 — even exceeding last year's annual total record by almost 60,000 units. Meanwhile, Chinese manufacturers have sold more than foreign suppliers in their home country. Their installations rose by 15%, reaching 195,000 units — a domestic market share of 55% in 2025 compared to 57% in 2024.



Bega Group reduces emissions with rooftop solar

Australian food and beverage manufacturer Bega Group has partnered with AGL to install a 1.23 MW rooftop solar system at one of its largest manufacturing facilities in Western Sydney, in order to help reduce its reliance on grid electricity and support its target to reduce Scope 1 and 2 emissions by 40% before 2030. Delivered under a 15-year power purchase agreement (PPA), the solution provides access to renewable energy without the upfront capital investment in the solar system.

Food and beverage manufacturing is energy intensive, making reliable and efficient energy an important part of day-to-day operations. At Bega Group's Wetherill Park facility, the business was looking for a practical way to reduce reliance on grid electricity and lower operational emissions while supporting manufacturing operations and progressing towards its sustainability goals.

Under the power purchase agreement, AGL owns and operates the system, while Bega Group purchases the electricity it generates at the agreed PPA rate. This enables Bega Group to access renewable energy without making an upfront capital investment in the solar system.

New wastewater facility opens in Western Sydney

The NSW Government has opened a new wastewater facility in Western Sydney, which it says will enable more than 140,000 new homes and businesses to be connected to critical wastewater services.

The \$1.2 billion Badu Yarragul Water Resource Recovery Facility at Kemps Creek aims to help support the next chapter of growth across Western Sydney, providing essential wastewater services to support new homes, jobs and economic growth across the Aerotropolis, Bradfield City and the surrounding region.

On opening, the new facility can treat up to 35 megalitres of wastewater each day, producing biosolids that can be reused in agriculture and forestry and enabling recycled-water opportunities. The government says it is one of the most advanced wastewater recycling facilities in the Southern Hemisphere, using a membrane bioreactor and reverse osmosis to produce exceptionally high-quality treated water.

Future upgrades are already planned that will double the facility's capacity to 70 megalitres per day, supporting a footprint of more than 280,000 new connections.

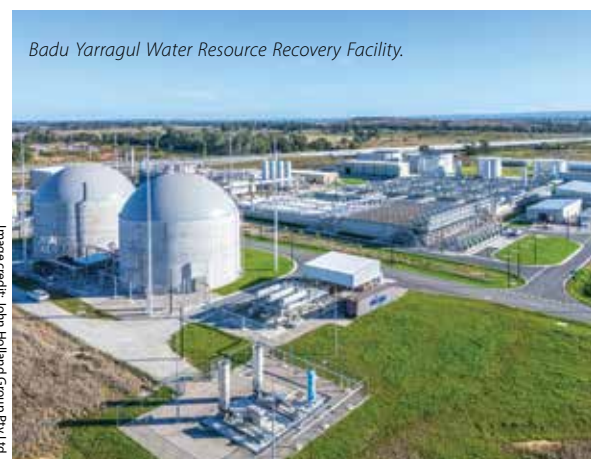
Badu Yarragul, meaning "freshwater cleaning", reflects both the purpose of the facility and its location on Wet Country.

Sustainability has been embedded throughout design and construction, including:

- a 4 MW solar farm capable of generating half of the facility's energy needs
- internal roads incorporating a combination of recycled coffee cups and low-carbon binder
- pipe bedding made from recycled glass.

"This is one of the most advanced water facilities in Australia and a significant milestone for NSW, supporting a cooler, greener city that is future-proofed for tomorrow," said Minister for Water Rose Jackson.

Badu Yarragul Water Resource Recovery Facility.



WET SCRUBBER

The Handte Venturi wet scrubber is designed for applications with high dust loads, and is designed to separate airborne contaminants through the Venturi principle.

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The ÖLFLEX motor and servo cable range is designed to deliver reliable power, control and feedback in demanding industrial drive applications.

LAPP Australia Pty Ltd



NATURAL GAS MANIFOLDS

The NOSHOK 5030/5130 series 5-valve natural gas manifolds are engineered for natural gas applications using differential pressure transmitters.

AMS Instrumentation & Calibration Pty Ltd



RUGGED WINDOWS TABLET

The RTC-I116 is a rugged 11.6" Windows tablet designed to streamline factory automation, process control and field instrumentation workflows.

Interworld Electronics and Computer Industries



Remote telemetry for Tasmanian irrigation



Cromarty is an Australian automation and electrical engineering business that has been working in industrial automation, measurement and control for more than 35 years. Recently, the company worked with Ovarro to develop a monitoring solution for the Don Irrigation Scheme in Tasmania.

The Don Irrigation Scheme is a major regional infrastructure project for north-west Tasmania, supplying irrigation water to the Don, Forth, Barrington and Sheffield districts. It delivers 4750 megalitres of summer water and 4750 megalitres of winter water, supporting irrigators across a 180-day summer season and a 180-day winter delivery period.

Drawing water from the Forth River catchment, the scheme uses three pump stations, balance tanks and 53 km of distribution pipeline to deliver water to irrigators at a peak flow rate of 39.6 ML per day. Operators need to manage flow and pressure across remote outlet installations while maintaining dependable water delivery throughout the irrigation season.

For local agricultural businesses, dependable irrigation can influence planning decisions, crop choices and investment confidence, so the supporting monitoring infrastructure is particularly important.

For Cromarty, the project required a solution that could perform consistently across remote property outlet installations. Many of the sites are located away from mains power and fixed communications infrastructure, meaning the telemetry system needed to combine low power consumption, reliable cellular communications and robust field performance. The project therefore required more than a standard monitoring device; it needed a remote telemetry platform capable of supporting dependable data acquisition across a distributed irrigation network.

Previous alternative telemetry technology had been trialled but found to be insufficiently robust for the remote locations across the scheme. To address this, Cromarty worked with Ovarro to deploy a telemetry solution based around Ovarro's TBox remote telemetry units (RTUs).

Ovarro's TBox RTUs were selected for the project due to their compact form factor, all-in-one design, temperature rating and communication protocols. They also support physical I/O, DNP3 protocol capability and integration with the existing SCADA environment.

"The devices have to be robust. They have to be able to work in the environment and also needed to be practical for repeat deployment," said Paul Stute, Product Sales Manager for RTUs at Ovarro. "They need to have

the communications capability and the protocols required for this type of infrastructure."

During integration, early technical challenges were resolved with support from Ovarro's technical team, while suitability testing was carried out before final decisions were made with the client. This support included assistance around the communications setup, including virtual private network configuration and the allocation of IP addresses to the RTUs through the telecommunications provider.

Cromarty also developed and tested code offsite, creating a template that could be rolled out across multiple installations. This helped ensure that the selected approach could be tested, refined and confidently rolled out before being deployed across remote property outlet installations.

The TBox RTUs provide monitoring for property outlet installations across the Don Irrigation Scheme. These assets enable Tasmanian Irrigation to monitor farmers' water allocation usage through flow and pressure data, requiring field devices that can support reliable communications and data acquisition in remote environments.

By enabling remote visibility of flow and pressure data, the telemetry system supports more effective management of irrigation assets and helps operators identify issues without relying solely on site visits: the system gives operators better visibility of remote assets and reduces the need to depend on manual checks alone.

"The TBox is well suited to remote site applications like this one," said Michael Holmes, Manager Engineering and Asset Intelligence at Tasmanian Irrigation. "It is proven on our network, integrates cleanly with our SCADA and performs reliably in the conditions we deploy it into."

"Ovarro's support helped resolve the early integration challenges and gave us confidence in the suitability of the solution before deployment," said Eric Goh, Automation Engineer at Cromarty. "The system has been reliable since deployment, with minimal issues."

Operators can now maintain oversight of the network, while farmers benefit from infrastructure designed to support dependable water delivery. The success of the project has also helped establish a repeatable approach for future schemes.

Ovarro
ovarro.com

MINIATURE FORK SENSORS

Compact miniature fork sensors and fork label sensors have been launched by wenglor sensoric for various detection tasks in packaging, conveyor and automation technology. While the fork sensors enable reliable object detection in confined spaces, the label sensors are designed to provide stable labelling processes for transparent, glossy or low-contrast materials.

The fork sensors combine a particularly compact format with high switching accuracy so they can be integrated in confined installation situations, such as in shuttles or automated guided vehicles. They capture small parts from a size of 0.7 mm and are available in three fork widths of 10, 20 and 30 mm. With their low weight, space-saving format and IP67/IP68 degree of protection, the miniature fork light barriers are particularly suitable for applications in conveyor systems, assembly processes and robots.

The fork label sensors utilise optical or ultrasound-based technology for the detection of a wide range of label materials. The optical sensors use infrared light to identify labels based on the light signal received. Ultrasonic label sensors detect labels regardless of colour, transparency and surface finish based on different sound attenuation. This makes them particularly suitable for transparent, glossy and low-contrast labels. With a response time of only 0.25 ms, they also provide reliable detection at high belt speeds.

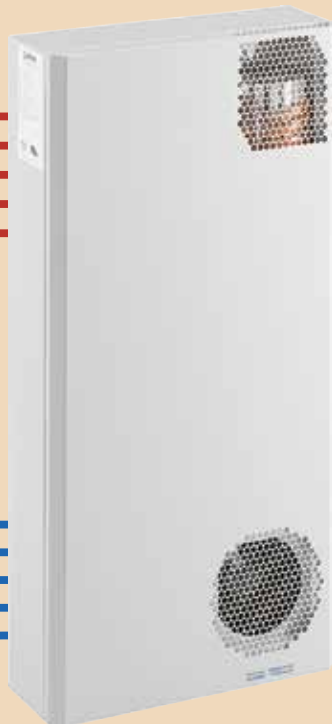
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ROTARY TORQUE TRANSDUCER

The Interface T29 slip ring hex drive rotary torque transducer is a compact, high-accuracy torque sensor designed specifically for screw driving systems and dynamic torque measurement applications. Featuring a slip ring design with hexagonal drive and output sockets with quick-action chuck, the T29 enables simple integration, fast tool changes, and reliable continuous rotation measurement in demanding industrial environments.

It's very short axial length and high torsional stiffness are designed to provide precise torque transfer while minimising installation space requirements. Suitable for process measuring and control technology, automotive manufacturing, tool engineering and specialised machinery, they can be used in monitoring, testing and control applications. Optional TEDS functionality according to IEEE 1451.4 is available for simplified sensor identification and setup.

AMS Instrumentation & Calibration Pty Ltd
www.ams-ic.com.au

ENCODER CABLE PULL MECHANISM

The WPS cable pull mechanism for the C__582 series rotary encoders from TR Electronic is designed to permit precise position measurement over long distances. The mechanism has been specifically reduced in size and offers optional IP67 protection for use in harsh environmental conditions.

The compact integration of a genuine multiturn encoder directly into the cable pull mechanism has significantly reduced the installation space required. Installation on machines is flexible: the direction of the data and supply cables can be customised to suit requirements. Grooves for slotted nuts on three sides of the housing and additional holes in the drum housing provide simple and stable mounting.

The WPS cable pull mechanism is fully integrated into the C_582 range, providing industrial Ethernet capability via Profinet, EtherCAT, EtherNet/IP or Powerlink; fieldbus capability via CANopen, Profibus and Interbus; and point-to-point connectivity with SSI, analog, parallel, RS485, IO-Link and DRIVECLIQ.

Application-specific connector arrangements (radial or axial) are also available. Synchronised position detection and extended encoder data for machine monitoring and Industry 4.0 round out the package.

Leuze electronic Pty Ltd
www.leuze.com.au



NON-INVASIVE TEMPERATURE INSTRUMENTS

ABB has expanded its NINVA non-invasive temperature instrument range with the introduction of NINVA Integrated, NINVA Remote and NINVA Compact. The latest solutions are designed to address needs in oil and gas, chemicals, power and marine applications.

NINVA instruments clamp directly onto the outside of the pipe, giving plant operators process temperature readings without the need to cut, weld or maintain traditional invasive thermowells. Using the surface temperature of piping to infer temperature, NINVA provides the same level of accuracy and performance of invasive measurement devices without the inconvenience of installing and maintaining them, according to ABB.

With reduced design and engineering costs, and decreased material, inspection and installation costs compared to thermowells, NINVA presents a more cost-effective measurement solution. ABB says that with NINVA, users can expect up to 75% reduction in workload and capital expenditure costs.

NINVA Integrated is designed for use in the chemicals and oil and gas industries. It works with metal piping DN15–DN2500 and is suitable for brownfield upgrades where shutdowns and hot work are costly.

NINVA Remote is engineered for high-temperature and hard-to-access areas in power and utilities, especially steam and high-temperature gas environments (more than 400°C) and withstands high vibrations of up to 2g. It pairs with ABB's TTF300-N field-mount transmitter for flexible mounting and remote display.

Marine certified, NINVA Compact is designed for machine environments where space is limited. It has high vibration capability of up to 4g and works with small piping DN15+, skid systems and mobile assets.

ABB Australia Pty Ltd
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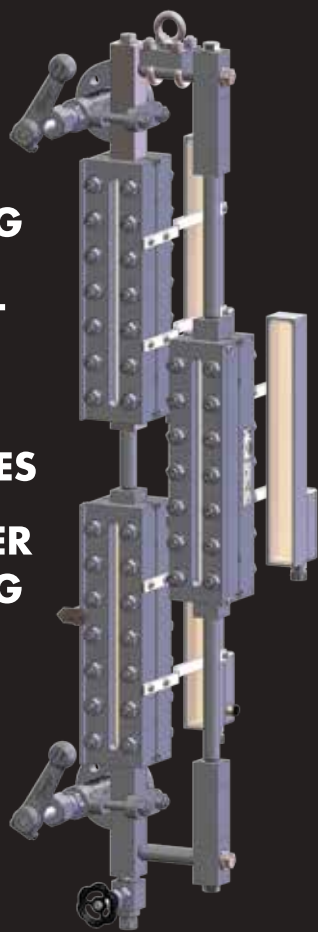
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INSTRUMENTATION & SENSORS



DIGITAL PH/ORP SENSOR

The Rosemount 350A pH/ORP sensor is designed to deliver reliable measurements in harsh processes while simplifying installation and maintenance through a digital, plug-and-play sensor connection.

Many demanding pH applications, especially high-temperature, high-pressure and retractable installations, can challenge conventional analog sensors with signal noise, wiring complexity and limited diagnostics. Emerson says the Rosemount 350A digital sensor addresses these issues by converting and transmitting pH/ORP data digitally, reducing susceptibility to electrical noise and helping to get to a stable measurement faster.

With a digital Modbus interface and M12 quick-connect cabling, the sensor supports plug-and-play commissioning and can help eliminate common installation errors associated with manual wiring. The digital design also enables interoperability across Rosemount digital liquid analysis sensors, supporting simplified spares and standardisation across sites.

The Rosemount 350A stores calibration data and diagnostic information in the sensor, supporting bench calibration workflows and helping maintenance teams troubleshoot with more context. It also supports retractable mounting styles and is offered with titanium body options.

Emerson

www.emerson.com

INDUCTIVE RING SENSORS WITH IO-LINK

Turck has expanded its sensor portfolio with a new range of inductive IO-Link ring sensors designed for the reliable detection of small metal parts. The BlxR-W20 series is engineered to address common sensing challenges in feeding systems, conveyor applications and machining centres, offering a standardised, IO-Link-enabled alternative to conventional sensors with fixed functionality.

Available in eight ring diameters from 6–50 mm, the BlxR-W20 sensors can be configured for sensitivity, switching logic, output type and either static or dynamic operating modes. Configuration can be carried out via IO-Link or a teach adapter, providing flexibility during commissioning and operation.

Beyond process data, the sensors deliver extensive diagnostic information, including operating hours, switching cycles and temperature monitoring. This data supports condition monitoring initiatives and enables predictive maintenance strategies, helping manufacturers improve equipment reliability and reduce unplanned downtime.

Typical applications include feeding systems for automated screwdriving machines, part counting and sorting on conveyor systems, as well as wire breakage and jam detection. In dynamic operating mode, the sensors can detect very small, fast-moving metal components, with adjustable pulse lengths and high repeatability.

Turck Australia Pty Ltd
www.turck.com.au/en



FREE-BEAM RADAR SENSOR

The Wika ILT radar sensor is a free-beam sensor that enables non-contact level measurement, including through the walls of plastic containers. Its compact design makes the ILT suitable for applications where space is limited. Manufacturers can, for example, install the sensor in mobile working machines or heating systems. Non-contact technology enables high-precision measurement of the level of particle-containing, highly viscous or solid materials. Possible applications range from wastewater plants to all types of raw material containers and fuels.

The ILT-C01 version is designed for a temperature range of -40 to 100°C, while the ILT-C05 version also covers high temperatures up to 150°C. Metal shielding protects the sensor from interference caused by electrical fields in the environment. The instrument is designed to operate reliably even under adverse conditions such as dust, moisture and heat, and can tolerate vibrations and shocks of up to 100g. With up to two additional switch points, further switching outputs can be integrated, for example for overflow or dry run protection.

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FOUR COMMON CAUSES OF ROTATING ASSET FAILURE AND HOW TO PREVENT THEM

Turck Australia & New Zealand

Preventing failure of rotating assets with predictive maintenance using condition-monitoring solutions.

It's every facility manager's nightmare: a catastrophic failure where one of the plant's critical production assets fails without warning and causes secondary damage to an attached asset. Production is stopped and revenues are in jeopardy.

Industrial facilities may have hundreds of rotating assets such as motors, pumps, fans, compressors and gearboxes, and it can be a complex task to ensure they're all healthy and running properly.

The practice of *reactive maintenance*, or running assets until failure, has long ago been replaced in most facilities by *preventive maintenance*, which prescribes routine checks and upkeep at preset intervals. In the case of vibration monitoring, the process is done by a technician walking the plant floor visually checking and lubricating rotating equipment and/or collecting vibration data with a mobile sensor.

While this is much better than the former method, there are drawbacks with preventive maintenance. Even if you're checking your assets every month or two, that still leaves 30–60 days between checks for something to go wrong; and routine checks don't always reveal gradual degradation of a

component. In addition, the process is labour-intensive and costly.

Predictive maintenance (or condition-based maintenance) is the practice of placing sensors on the rotating assets and sending performance data to a controller for analysis and trend reporting. This method positively evaluates the health of the asset by continuous monitoring, and it is the best approach of the three.

Predictive maintenance improves upon preventive maintenance in two important ways: the fact that monitoring is continuous ensures there's no gap of time in which problems can arise, and second, the process is automated, which eliminates the difficulty of tracking a large number of assets.

For rotating machinery, predictive maintenance uses vibration and temperature sensors to baseline normal running conditions and trend performance data over time. This process can detect gradually degenerating bearings early by trending and reporting changing vibration conditions.

The main benefit of predictive maintenance is the elimination of unexpected asset failures and unplanned downtime. And it allows for the assets to be serviced during planned downtime.



Industrial automation equipment makers offer a range of wireless monitoring devices that can identify early problems in rotating assets, like motors, fans and pumps, by collecting and analysing vibration and temperature data. These devices make it cost-effective to monitor asset health parameters, set benchmarks, chart trends, set warning thresholds and trigger alarms.

This has advantages that include:

- Reducing the possibility of motor or attached equipment damage and the associated, unplanned downtime.
- Allowing advanced notice for corrective maintenance scheduling.
- Easily collecting data from remote locations via wireless communication and



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sending data to the cloud, and allowing remote access.

- Offering the ability to review data trended over longer periods of time.
- Having a more strategic approach to maintenance that reduces stress and uncertainty.

VIBRATION PARAMETERS: VELOCITY AND ACCELERATION

Condition-monitoring equipment can identify component defects by evaluating the vibration parameters of velocity and acceleration. Velocity is the measurement of how fast an asset is moving back and forth (or vibrating) in multiple axes. Acceleration is the rate at which the velocity increases from one speed to another. Vibration

sensors can detect a rotating asset's vibratory movement: side-to-side, up-and-down, or back and forth. Once the acceleration waveform sample is collected by the controller, its vibration analysis software processes that data to produce a velocity measurement as well.

Faults found using the velocity parameter will typically be vibrations you are able to feel but not hear. Faults found using the high-frequency acceleration parameter will be vibrations you cannot feel, and you may or may not be able to hear.

A single sensor can properly collect accurate data in two axes, which is sufficient to analyse asset health. A second sensor can be added in certain circumstances to collect additional data.

TEMPERATURE

Condition-monitoring equipment also evaluates rotating asset health by trending bearing temperature. Awareness of temperature rise is an important part of the predictive maintenance regiment. While vibration anomalies first appear in the early stages of bearing-health decline — long before damage begins — rising bearing temperatures appear in the later stages. Unlike vibration parameters, there is no baselining of temperatures calculated by typical condition-monitoring systems.

Default thresholds are normally set at about 70°C for a first 'alert' and 80°C for a 'warning'. Motor manufacturers specify temperature ranges for the asset, so

>>

users can change the default bearing temperature thresholds as needed.

FOUR COMMON CAUSES OF BEARING DEGRADATION IN ROTATING ASSETS

Bearing degradation is often the result of four common problems with rotating assets. These conditions are all related to either improper installation or improper maintenance, and each of them can be detected via an asset vibration signature with the right sensor, if installed and monitored properly.

1. Misalignment of the motor to the pump

To transmit power from a motor to a pump, the motor shaft is connected to the pump shaft. If these shafts are not properly aligned, it can cause early wear on the shafts, coupling or pump seal, as well as cause early bearing defects. Each of these can lead to reduced pump life.

There are two ways a motor and pump can be misaligned: parallel and angular. In a parallel misalignment, the centrelines of the motor and pump shafts are parallel but not lined up. In an angular misalignment, the motor and pump shafts are at an angle to one another.

A visual clue that may be present is the pump may be 'soft-footed' or 'cock-footed', in which one of its feet is slightly raised rather than sitting flatly on the floor, which is an indicator of the misalignment condition. Misalignment typically results in noise, vibration and eventually fluid leaks. It also reduces system efficiency.

Problems with motor-to-pump misalignment can be detected by analysing velocity and bearing temperatures.

2. Lack of proper bearing lubrication

Bearings can be under- or over-lubricated or fouled with dirt, dust or liquids, causing friction and heat, which will lead to bearing failure if undetected. When bearings lack proper lubrication, they will exhibit four stages of deterioration. Each stage has a distinct warning sign, but these warnings will go unnoticed without the proper monitoring sensor to collect and report the data.

Bearings will exhibit a high-frequency vibration, not audible to the human ear but detectable with vibration sensors.

The bearing vibration will generate a frequency spectrum composed of bearing cage vibration and 'false spin' vibration. It is at this and subsequent stages that typical

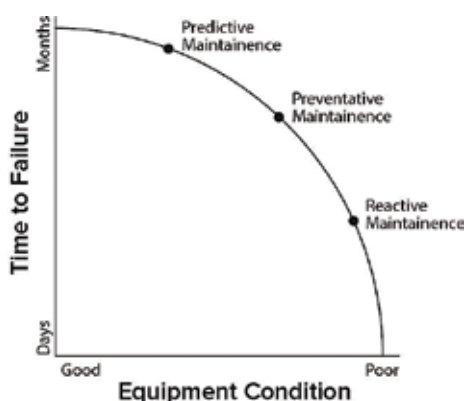


Figure 1: Predictive maintenance affords the most advanced notice to correct problems before they become critical.

vibration sensors are able to detect the onset of bearing problems.

Deformities will appear on the outer and inner bearing races, which will cause another level of vibration that generates a telltale band of frequencies.

Vibration may become audible, in a high pitch, and bearing temperature begins to increase.

Problems with lubrication can be detected with condition-monitoring systems by analysing high frequency acceleration, peak acceleration and bearing temperatures.

3. Misalignment of pump inlet or outlet pipe

Pump input and output pipes have flanges to bolt onto mating pipes. If these flanges don't mate up exactly, it can put a strain on the pipes, causing stress that results in vibration. When mating pipes are not lined up perfectly, pipe stress will twist the pump. Similar to the misalignment of shaft axes, the asset may be cock-footed. Vibration generated from pipe misalignment has a unique frequency signature that is used to identify the problem. The results of pipe stress are early coupling and bearing wear.

Parameters used to detect pump input/output pipe misalignment are high-frequency acceleration, peak acceleration and velocity, as well as bearing temperatures.

4. Pump cavitation

Cavitation refers to air cavities or bubbles that rapidly form and burst in a fluid near the pump impeller. These air cavities are often formed when a pump is oversized for the job, causing a higher than normal

pressure. Engineers like to specify oversized components to ensure they are more than capable to handle their work, but when there isn't enough fluid for that oversized pump to pull from, it can pull in air along with the fluid, causing the problem.

When these bubbles experience higher pressure, they collapse, producing tiny shockwaves that cause gradual but significant pitting and wear of the impeller, pump housing, bearings and seals. The bubble implosions make crackling sounds, as if gravel is rattling around the pump housing or pipework, and another symptom of this problem is vibration.

A second source of cavitation is impeller and wear-ring wear. As these components degrade, it creates a small air gap, which can cause cavitation, resulting in similar vibration anomalies.

The parameters used to detect cavitation are peak acceleration and velocity.

IMPLEMENTING A PREDICTIVE MAINTENANCE SOLUTION WITH CONDITION MONITORING

Manufacturers offer a range of solutions that incorporate sensors, controllers, software and associated equipment to monitor rotating assets for anomalous vibration patterns. Self-contained condition-monitoring kits are also available, which are fully pre-programmed



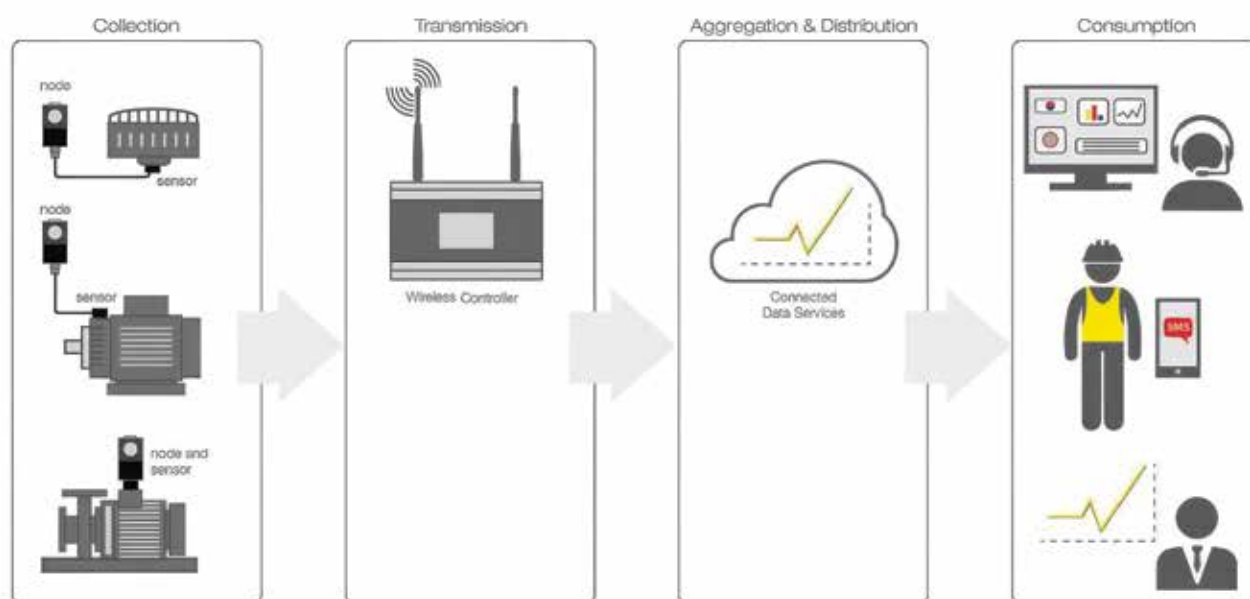


Figure 2: Example of an end-to-end condition monitoring system used for predictive maintenance.

and include everything needed for a complete solution, including a vibration and temperature sensor paired with a controller and vibration-analysis software.

The controller can generally connect to a wireless sensor network and can locally deliver data to an HMI for visualisation of asset health, and also directly to the cloud where dashboards can be generated to reveal the health of rotating assets and send

alerts for work orders via SMS or email.

Typical vibration sensors can monitor RMS velocity (10–1000 Hz), RMS high frequency acceleration (1–4 kHz) and temperature on rotating equipment.

The greatest value of these vibration solutions is that they can send (via desktop or cell phone) alerts and warnings, triggering work orders for maintenance on assets that need attention.

SUMMARY

Keeping the factory running smoothly so it can generate revenue is a facility manager's most important job, while unplanned production shutdown is their biggest worry. Although preventive maintenance is better than waiting for equipment to fail, predictive maintenance is significantly better because it's best able to help managers avoid damage to rotating assets that halts production.

Predictive maintenance employs continuous condition-monitoring systems, primarily comprising sensors, a controller and specialised vibration-analysis software. By continuously monitoring equipment, predictive maintenance techniques let plant managers see bearing health trends and keep equipment well maintained, extending its life.

Because rotating assets require bearings to be in good health, facility managers who haven't yet adopted predictive maintenance should consider the benefits it can bring to their plant. Considering that rotating assets like motors, pumps, fans and gearboxes are the life of the automated factory, moving to predictive maintenance is a relatively low-cost investment that enables plant operators to stay well ahead of maintenance issues and eliminate crises. Predictive maintenance will pay for itself many times over by keeping equipment productive longer and preventing unplanned factory downtime.



MANUFACTURERS OFFER A RANGE OF SOLUTIONS THAT INCORPORATE SENSORS, CONTROLLERS, SOFTWARE AND ASSOCIATED EQUIPMENT TO MONITOR ROTATING ASSETS FOR ANOMALOUS VIBRATION PATTERNS.

Bonfiglioli solutions power iQRenew's Wyong facility upgrades



Australian recycling specialist, iQRenew, recently completed an extensive upgrade of its Wyong facility, enabling the company to cut a new trail in the industrial recycling landscape by transforming previously unusable glass waste into a valuable, engineered product on-site.

According to iQRenew Mechanical Engineer and Fitter, Jack Gallagher, the recycling centre is challenging long-held perceptions of recovered glass and its potential value for the market, making the upgrades especially significant.

To support the project, iQRenew partnered with Bonfiglioli, which had supplied the majority of the facility's existing gearboxes and ancillary equipment.

Gallagher explained how the Wyong site — known internally as the 'Virtual Quarry' — has been designed to increase processing capability while creating a more efficient and advanced recycling operation capable of meeting growing industry demand.

"Traditionally, mixed kerbside glass contamination created challenges because much of the material could not easily be converted back into bottles," he said. "Instead of simply crushing glass and sending it elsewhere, we are focused on creating a reusable manufactured resource that supports circular economy initiatives and sustainable industry practices."

This is a multi-stage process involving separation, washing, impact processing, drying and precision grading which all require specialised equipment.

"The upgrade project required a wide range of gearboxes across different applications, from low torque high speed systems through to heavy duty, high torque machinery," Gallagher said.

According to Alex Kolc, Bonfiglioli NSW Sales Engineer, the Wyong recycling centre already had standard-built Bonfiglioli units installed. The upgrades provided a new opportunity for the Bonfiglioli team to support iQRenew in resolving equipment challenges.



Images credit: iQRenew

"Bonfiglioli is always supporting customers through spare parts, upgrades, aftermarket services and building relationships through contact — and this project with iQRenew was no exception," he said.

Elaborating on the technical support provided by the Bonfiglioli team, Gallagher said: "They have consistently worked closely with our team to ensure the correct components and specifications were selected for each application while providing ongoing support whenever required. Having reliable suppliers who understand both operational requirements and long-term project goals is extremely important in an operation like Wyong."

Looking ahead, Gallagher is excited about the continued optimisation and development of the Wyong facility.

"With growing industry focus on sustainability and resource recovery across Australia, the Wyong centre is well-positioned to become an increasingly important part of the country's recycling and manufacturing future. We are proud to have strong partners like Bonfiglioli supporting that journey."

Bonfiglioli Transmission Pty Ltd
www.bonfiglioli.com.au

NEWPRODUCTS

IO-LINK MASTER

The AL1602 IO-Link master from ifm offers eight IO-Link ports (Class A/B) with a total of 16 flexibly configurable inputs and outputs. With a current rating of up to 2 A per output, it is suitable for powerful actuators such as those used in the logistics sector. The housing and the fully overmoulded circuit board provide a high level of durability, making the AL1602 resistant to both condensation and vibration.

With its IP67 protection rating and an operating temperature range of -40 to 70°C, the device is suitable for use in harsh industrial environments. The new plastic ports offer higher tightening forces than the previous metal ports of the AL14 series. The common ground concept enables simple and flexible port configuration, supporting compact and cost-efficient device operation. The integrated daisy-chain function allows multiple IO-Link

masters to be supplied with power easily, significantly reducing wiring effort.

The integrated multiprotocol interface allows the IO-Link master to be easily integrated into various fieldbus architectures. Initially, Profinet and EtherNet/IP are available. The interface supports the level of standardisation frequently required in mechanical and plant engineering, reduces variant diversity and sustainably minimises engineering effort.

ifm efector pty ltd
www.ifm.com/au



INDUSTRIAL 5G SMARTPHONE

The Smart-Ex 203 from Pepperl+Fuchs is an industrial-grade 5G smartphone designed for reliable communication and digital workflows in Zone 2/22 and Div 2 hazardous areas.

Supporting 52 frequency bands across global 5G and 4G networks, as well as Wi-Fi 6, the Smart-Ex 203 is designed to enable fast, reliable communication and low-latency data transfer. Its dual SIM functionality, featuring eSIM and Nano SIM, also simplifies switching between private and public networks.

A large 6.3-inch display, Google ARCore support and high-resolution cameras make the Smart-Ex 203 suitable for digital workflows, augmented reality applications, remote maintenance and training. The 48 MP rear camera with autofocus and LED flash provides high-quality images and Full HD video, while the 16 MP front camera supports clear communication in the field. For added convenience, Smart Call Handling enables intuitive call control using simple hand gestures, while an optimised fingerprint sensor provides secure biometric authentication.

A newly developed accessory interface further extends the smartphone's capabilities. When paired with the SM-Ex S203 scanner module, the Smart-Ex 203 becomes a 1-D/2-D barcode scanner, enabling reliable mobile scanning. With long-term Android support and security patches until March 2032, the Smart-Ex 203 is designed to provide connectivity, flexibility and performance in industrial mobility.

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CRITICAL INDUSTRIES NEED TO KNOW HOW TO ISOLATE, RATHER THAN IGNORE

When the Australian Signals Directorate revised its CI Fortify guidance in July, it wasn't primarily responding to another ransomware headline. It was responding to a harder, more strategic problem: state-sponsored actors, particularly those linked to China, quietly pre-positioning themselves inside critical infrastructure networks so they can disrupt or disable essential services if a regional conflict ever reaches Australia's shores.

This is not the work of cybercriminals chasing a payday. It is a deliberate, patient campaign, one designed to hold Australia's essential services hostage to a future geopolitical crisis. What is even more concerning is that these threat actors can often infiltrate a network and lay idle for prolonged periods of time, waiting until the right moment to cause maximum damage.

In a recent speech Australian Security Intelligence Organisation Director-General Mike Burgess warned of persistent threats by nation-state actors compromising Australian critical infrastructure networks. In one particular case, ASIO uncovered hackers that had compromised a critical infrastructure provider in Australia: a state-sponsored group that successfully acquired credentials for active users of the networks, including the IT professionals guarding it.

The threat actor didn't strike straight away. Instead, they waited patiently, collecting information in preparation for sabotage. Sitting in the shadows, mapping out the network and maintaining access to servers so they could cripple it whenever they chose.

With the pervasiveness of these threats, it's no surprise that in late July the Australian Signals Directorate (ASD) updated its CI Fortify guide to help critical infrastructure organisations improve their cyber resilience. The new guide explains the importance of isolating critical operational technology and supporting systems from other networks.

The timing is not a coincidence: the clearest example of the threat CI Fortify is built to counter is Volt Typhoon, a Chinese state-sponsored group that US and Australian agencies have assessed is pre-positioning inside power, water and communications networks across the US and the wider Asia-Pacific — to be ready to disrupt those services if a conflict over Taiwan draws in the US and its allies. This is the scenario CI Fortify is built around: a state actor holding a country's ability to function hostage until it chooses to use it.

The new guidelines outline how important visibility and isolation are to effectively understand operational technology (OT) networks and,

in the worst-case scenario, shut them down if a cyber threat occurs.

What stands out about CI Fortify is how much of it rests on a single precondition: you cannot isolate what you cannot see. The guidance asks operators to identify the minimum set of systems needed to keep a critical service running, map every dependency between them, and then define clean separation points.

The revised guidance also states that operators should be able to run essential services fully disconnected from corporate networks and the internet for up to three months. That is not a switch you flip mid-incident: it requires knowing in advance which assets are vital, which can be shed, and how the isolated environment will keep functioning once the connections are cut.

Isolation is not the finish line, and the guidance is candid about the trade-offs it introduces. A disconnected environment is harder to patch, loses some external threat visibility, and becomes more exposed to risks. Continuous monitoring therefore has to continue behind the isolation boundary.

This is where preparation separates resilient operators from the rest. Threat actors who quietly map a network and wait, as ASIO described, are counting on defenders who lack that same visibility. An operator that has already inventoried its assets, rehearsed isolation and kept offline copies of its response plans can cut off an intruder in a few deliberate steps. One still discovering what is connected while an incident unfolds has already lost time it cannot spare.

At the end of the day, our threat intelligence agencies can only do so much if organisations aren't prepared to take advice, guidance, and warnings seriously. Australia doesn't need to be a direct party to a conflict over Taiwan to feel its consequences at home. If the scenario ever plays out, the operators who treated CI Fortify as a compliance exercise, rather than a genuinely tested isolation capability, will be the ones finding out the hard way.



Chris Grove is Director of Cyber Security Strategy at Nozomi Networks.

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NEWPRODUCTS

FANLESS EMBEDDED COMPUTER

Interworld Electronics has released the AAEON BOXER-6649-RAP, a fanless embedded computer engineered for industrial automation, machine vision, smart surveillance, transport and edge AI environments.

Powered by 13th Generation Intel Core i7/i5/i3 processors with integrated Intel Iris Xe graphics, it is designed to efficiently handle data processing, machine control and visual workloads. It supports up to 96 GB of dual-channel DDR5 SODIMM memory to provide the bandwidth necessary for real-time operations, and storage configurations include an internal 2.5" SATA drive bay alongside an M.2 2280 M-Key (PCIe Gen 4 x4) slot for high-speed NVMe SSDs.

The system features a wide array of industrial I/O, including two HDMI 2.0 ports for dual independent displays, two USB 3.2 Gen 2 (Type-A) ports, four USB 2.0 ports, eight DIO, and two DB-9 ports for RS-232/422/485 serial communication. For networking, it provides five 2.5 GbE LAN ports, four of which support PoE PSE to power IP cameras and sensors directly.

Wireless and remote connectivity can be expanded via an M.2 2230 E-Key slot for Wi-Fi or Bluetooth, an M.2 3052 B-Key slot for 4G/5G modules and an integrated SIM card slot.

Designed for challenging conditions, it supports a wide 9–36 VDC power input with built-in protection circuitry. The fanless chassis operates across a -25 to 60°C temperature range and delivers 3G_{rms} vibration resistance alongside 50G shock protection. It includes a wall mount as standard, with an optional DIN rail kit available for control cabinet integration.

Interworld Electronics and Computer Industries
www.ieci.com.au



PREDICTIVE ANALYTICS ENGINE FOR GAS TURBINES

PowerEye is Camfil's predictive analytics engine, designed to help power producers better understand how environmental conditions, changing weather patterns and filtration performance affect the health and efficiency of gas turbines. PowerEye is designed to transform operational data into actionable intelligence, giving operators the visibility needed to make informed decisions that improve power output, optimise maintenance strategies and increase profitability across their fleet.

Available through an annual subscription with multiple service levels, PowerEye combines data from three key sources: a proprietary Camfil Air Monitoring Station, facility site historian data and online weather services. The Air Monitoring Station continuously measures temperature, humidity, pressure and dust concentration, while engine performance information is collected from site historian systems. The data is securely transmitted to the central PowerEye server, where it is analysed using Camfil's filtration database and predictive analytics engine.

By evaluating the impact of ambient conditions and inlet filtration on combustion turbine performance, PowerEye provides insights that help operators maximise asset reliability and efficiency. Users receive proactive support from a dedicated team of filtration specialists that provides performance analysis, power output predictions, pressure drop trends, filter life forecasts and filter change recommendations. The system can also identify optimal offline water wash schedules, helping facilities maintain peak turbine performance while reducing unnecessary maintenance costs.

For organisations managing multiple sites, PowerEye provides a fleet-wide view of asset performance across different environmental conditions, accessible through email reports and a web-based dashboard.

Camfil Australia Pty Ltd
www.camfil.com.au

OPERATIONAL COST REDUCTION IN AUTOMATION

CHOOSING THE RIGHT AUTOMATION TECHNOLOGY TO REDUCE OPEX

Marcus Stemler, Head of Corporate Sustainability, Festo

Cutting operational costs in automation means analysing each application's real cost drivers and assessing total lifecycle cost.

OPEX reduction in automation is not about choosing between pneumatic and electric technology. It is about deciding on the right technology for the right application. It starts with knowing where costs actually arise, but however useful energy targets, compressed air reduction and electrification plans are, they do not automatically point to one technology.

The right decision depends on the application, duty cycle, infrastructure, energy use, investment cost and total cost of ownership. This is where a structured automation assessment helps avoid making expensive assumptions.

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WHAT DOES REDUCING OPEX MEAN?

Reducing OPEX means lowering the recurring costs of operating machines, systems and production processes. In industrial automation, these costs can include energy use, compressed air supply, maintenance and servicing, downtime, spare parts, labour and the cost of inefficient processes. For automation engineers, OPEX reduction starts at the application level. It means asking where energy and operating costs are incurred, at the machine or machine module level. It also means checking whether a change in technology will generate measurable savings over the lifecycle, or whether a smaller optimisation will deliver better results.

This is important because pneumatic applications frequently have hidden opportunities for reducing operating expenses. In many cases, the first step is not to replace the technology, but to understand where air consumption, pressure levels, cycle rates or use of process air offer an interesting cost potential. Small pneumatic applications and short-stroke movements may still be economically viable and energy-efficient, while larger drives or high-consumption applications often justify a closer analysis.

OPEX VS CAPEX: WHY THE DIFFERENCE MATTERS

CAPEX is the investment cost required to buy or build a machine, system or component. OPEX is the cost of running it over time. A technology decision that looks attractive from a CAPEX perspective may lead to higher operating costs later, but the opposite can also be true: a higher initial investment may be justified if it reduces energy consumption, downtime or maintenance effort over the entire lifecycle.

This is why the total cost of ownership in automation is important. The best choice is not simply the solution with the lowest purchase price or the lowest energy consumption. It is the solution that fits the application, infrastructure and cost target over time.

For example, electrification can make economic sense when high energy use, precise control, frequent movement or reduced compressed air demand result in a possible payback. Efficient pneumatics can still be the better option where movements are simple, compact, fast and cost-effective throughout the lifecycle.



THE BIGGEST DRIVERS OF OPERATIONAL COSTS IN MANUFACTURING

The biggest operating cost drivers in automation are rarely the same in every application. They depend on how the machine works, how often it operates, what load it moves and how the existing infrastructure performs.

Relevant OPEX hotspots can include large pneumatic drives, high-consumption applications, process air, vacuum applications and areas where compressed air is supplied at a higher pressure than the application really needs. This can increase both air consumption and operating costs. Process air deserves special attention because it often consumes more compressed air than pneumatic actuation in production environments.

The decision should be based on the application data. Important factors include actuator size, stroke length, cycle rate, load, pressure level, air consumption, leakage, process air demand, energy price, maintenance effort and downtime risk.

The key point is simple: reducing operating costs starts with identifying the

real cost hotspots. It should not start with a blanket decision for or against a specific technology.

HOW AUTOMATION TECHNOLOGY HELPS REDUCE OPEX

Automation technology can reduce OPEX when it targets the right cost driver. The most effective route may be electrification, more efficient pneumatics, better pressure control, reduced air consumption, improved maintenance planning or a clearer comparison of lifecycle costs.

An objective technology assessment helps separate assumptions from real savings potential. Instead of asking whether pneumatic or electric technology is generally better, the more pertinent question is: which technology reduces operating costs in this specific application without creating unnecessary complexity?

Reducing downtime with predictive maintenance

Downtime affects OPEX as machines stop unexpectedly or require avoidable service work, resulting in production losses. Predictive maintenance can help teams



iStock.com / kymry



*CHOOSING THE RIGHT AUTOMATION
TECHNOLOGY STARTS WITH THE APPLICATION.*

Reducing these costs may require reviewing pressure levels, identifying leakages, improving diagnostics, using standardised components, creating clearer pressure zones or shifting to another technology when that benefits the application. The right answer depends on the full operating context, not on a single cost factor.

HOW TO CHOOSE THE RIGHT AUTOMATION TECHNOLOGY

Choosing the right automation technology starts with the application. Before replacing an existing solution, engineers should understand the movement, load, duty cycle, energy demand, infrastructure and lifecycle costs.

A useful decision-making process includes five questions:

- 1. Where are the operating costs actually incurred?** Check energy use, compressed air consumption, process air, maintenance effort and downtime risk.
- 2. Is the application a real OPEX hotspot?** Large drives, high cycle rates, process air and inefficient compressed air use may offer more potential than small, simple pneumatic movements.
- 3. Would optimisation be enough?** Pressure reduction, pressure zones, air-saving circuits or better-controlled pneumatic solutions often create a good balance between effort and savings without completely changing the technology.
- 4. Would electrification pay for itself?** Electric automation can be the right route when energy savings, precision, controllability or reduced compressed air demand justify the investment.
- 5. What does the total cost of ownership show?** The final decision should consider the investment cost, the running costs, maintenance, energy, infrastructure and the expected lifecycle performance.

move from reactive repairs to planned intervention when the application and data support it.

For automation engineers, this means checking where condition monitoring, diagnostics or application data can back up maintenance decisions. The value depends on how critical the process is, what the impact of a failure is and which data is available. It should not be seen as a universal fix for every component.

Lowering energy consumption

Energy efficiency in automation can be achieved using different measures. In pneumatic systems, potential options include reducing pressure, having demand-based pressure control, creating different pressure zones and introducing air-saving circuits. In other cases, electric automation may reduce energy consumption or improve controllability enough to justify the investment.

The most important factor is to be led by the application, not the technology label. A small pneumatic movement may not be the first place to search for savings. Instead, a large drive, high cycle rate or process air application may warrant a much closer look.

Increasing productivity through automation

Productivity can be increased when automation reduces manual effort, improves repeatability or supports more stable machine performance. This, in turn, has a positive impact on OPEX. However, any productivity gains would need to be clearly linked to the application. A technology change should match the required movement, process quality, cycle time and operating environment.

For many teams, the practical question is whether a new automation concept helps the machine run more efficiently throughout its lifecycle. That can include electric automation, an efficient pneumatics design or a combination of both.

Optimising maintenance and labour costs

Maintenance and labour costs can rise when systems are complex, difficult to diagnose or not reviewed regularly. Operating costs can also increase when the compressed air infrastructure, pressure settings or process air consumption do not suit the actual application requirements.

NEWPRODUCTS



COMPACT INDUSTRIAL COMPUTER

The Neousys POC-900 Series is a compact industrial computing platform designed for edge AI, automation and machine vision applications where installation space is limited. Powered by the AMD Ryzen PRO 8640U processor with integrated Ryzen AI capability, the POC-900 Series is designed to increase performance while maintaining a compact DIN-rail-ready form factor.

The system is suitable for smart factory, robotics, intelligent automation and industrial inspection environments where local processing helps reduce latency and supports faster decision-making. Its small footprint makes it particularly useful inside control cabinets or distributed edge deployments where larger industrial PCs are less practical.

The POC-900 Series also retains the dimensions of earlier compact POC platforms, helping make system upgrades easier for users looking to modernise existing installations. Combined with industrial I/O, local AI capability and fanless operation, it is designed to provide a practical platform for organisations bringing more intelligence closer to the machine.

Backplane Systems Technology Pty Ltd
www.backplane.com.au

STANDALONE MINIATURE PLCs

AutomationDirect has released the Productivity1000 Mini PLCs, the first standalone models in the Productivity range

with built-in I/O, combining the CPU and I/O into a single unit. Seventeen models are available to choose from with different communication options, I/O types and capacities, and available memory storage for up to 50 MB of user memory.

The Mini PLCs use the same ProductivitySuite programming software as the existing Productivity family of controllers. Models support up to five built-in communication ports simultaneously, including USB programming and serial communications. Select models include one or two 10/100 Mbps RJ45 Ethernet ports. Depending on the CPU model, a 10/100 Mbps RJ45 Ethernet port is provided for PLC programming or Modbus TCP, EtherNet/IP, MQTTs and custom UDP/TCP connections. P1-M622 models provide integrated support for GS drives, with PS-AMC functionality.

The compact form factor requires no base or backplane, and units can be used as a standalone controller or expanded with up to four snap-on I/O modules depending on the model, supporting up to 80 local discrete I/O points or 40 local analog I/O channels.

The Productivity1000 Mini series is suited to applications where reduced panel space, simplified wiring and lower hardware costs are priorities, without sacrificing the flexibility to scale I/O as system requirements grow.

Direct Automation Pty Ltd
www.directautomation.com.au



FRAMELESS MOTORS

Wittenstein cyber motor has added two new sizes — 130 and 155 — to its range of frameless motors in the cyber kit line. They are designed as an addition to the existing size 100 and 112 variants of the range. The motors are available with both a small and a large hollow shaft and are suitable for various lengths. They are designed for 560 VDC and can operate safely up to a DC bus voltage of 750 VDC. In addition, both sizes are compatible with all common servo drives on the market.

With their compact outer diameters, choice of lengths and reduced weight, these frameless motors are suitable for direct, space-saving integration in a diverse range of machines and integration environments, such as robotics, machine tools, filling machines and testing and measuring equipment. Hollow shafts in different sizes enable the space-saving routing of electric and fibre-optic cables, as well as compressed air and vacuum lines.

Treotham Automation Pty Ltd
www.treotham.com.au



Cybersecurity and digitalisation for Zimbabwe platinum mine



Image credit: Mimosa Mining

Mimosa Mine, a platinum-group metals (PGM) and base metals operation located in the Midlands Province of Zimbabwe, is undertaking a multi-year digital migration initiative aimed at modernising its operations and improving the resilience of its industrial infrastructure. As part of this journey, the mine recently upgraded its operational technology (OT) network and sought support for secure connectivity, cybersecurity risk management and long-term digital sustainability.

Rockwell Automation is collaborating with Mimosa Mine and Mine Elect to support the mine's ongoing modernisation program.

Through the project, Mimosa Mine is expected to benefit from improved visibility across its operational networks, stronger safeguards for critical systems and a more resilient digital foundation to support reliable and efficient mining operations over time. The scope of work focused on strengthening network architecture, improving security segmentation and establishing more secure mechanisms for system access, data transfer, monitoring and recovery.

"This project reflects a growing focus across the mining sector on operational resilience and cyber risk management as digital technologies become more deeply embedded in day-to-day operations," said Rodrick Naidoo, country director for English-speaking Africa at Rockwell Automation. "By working closely with Mimosa Mine and our local partner, we were able to align technology, governance and skills to support the mine's broader modernisation objectives while addressing the realities of an operational mining environment."

A key element of the collaboration is Rockwell Automation's longstanding partnership with Mine Elect, a Zimbabwe-based Rockwell Automation specialty distributor with deep experience supporting the

mining and industrial sectors locally. Mine Elect provided local engineering, implementation and onsite support, helping to connect global capabilities with in-country execution.

"We embarked on this digital transformation journey more than three years ago with the upgrade of key OT infrastructure, which included the migration of Mimosa's legacy OT networks to EtherNet/IP," said Dr Blessing Mahomva, managing director of Mine Elect. "Our role during this critical phase was to ensure the project was delivered in a way that was practical, sustainable and aligned with Mimosa's operational priorities. This collaboration brought together global industrial expertise and local knowledge to support a mining operation that is actively investing in its digital future."

Delivering industrial digital and cybersecurity initiatives in mining environments presents unique challenges. Mining operations combine legacy systems, harsh physical conditions, safety-critical processes and limited downtime windows, all which place constraints on how modern technologies can be deployed. In addition, the growing convergence of operational technology and information systems increases exposure to cyber risk, requiring careful design, sequencing and validation to avoid operational disruption.

"This project supports our broader digital migration journey by strengthening the resilience and security of our operational systems," said Lloyd Shamu, head of technical services at Mimosa Mining Company. "Having partners who understand mining operations, the local context and the importance of secure, reliable infrastructure has been critical as we continue to modernise the way we operate."

Rockwell Automation Australia
www.rockwellautomation.com/en-au.html

TESTING PROFINET I/O DEVICES WITHOUT A DEDICATED PLC

Patrick van Eybergen, Managing Director, Ti2 Group



istock.com/Zhenyu Zhang

Using CODESYS Control Win as a practical Profinet test environment.

If you work with Profinet devices, there are plenty of occasions when you want to test something quickly but don't necessarily have a PLC sitting on the bench.

Perhaps you're developing a device and want to check the GSDML. Perhaps you're an integrator who has just received a new piece of equipment and wants to make sure the Profinet interface behaves

as expected before taking it to site. Or perhaps you're troubleshooting a device and don't want to tie up a PLC from another project just to find out whether the problem is actually in the device.

This is where I find a software-based Profinet I/O controller particularly useful.

For example, a Windows PC running CODESYS Control Win can be used as a SoftPLC and, with the appropriate Profinet functionality, provide a practical test environment for a Profinet I/O device.

It isn't a replacement for a PLC in a production application, and it certainly isn't a replacement for formal Profinet conformance testing. But for the right job, it is a remarkably useful tool to have on the engineering bench.

WHAT ARE WE ACTUALLY TRYING TO TEST?

It's worth starting with the basics. When I receive a Profinet device for testing, I don't necessarily want to build an entire automation project around it. Initially, I want to answer some fairly straightforward questions such as:

- Can I import the GSDML?
- Does the device configure correctly?
- Can I establish the Profinet connection?
- Do the expected modules and submodules appear?
- Can I exchange cyclic I/O data?
- Do the diagnostics behave as expected?
- What happens when I restart the device?

These are simple questions, but answering them early can save a surprising amount of time later.

A basic Profinet test therefore needs a genuine I/O controller. The controller needs to understand the device description, establish the connection and exchange the configured process data, so normally, we'd reach for a PLC. But we don't always need to.

TURNING A PC INTO THE TEST CONTROLLER

This is where CODESYS becomes interesting. CODESYS is an IEC 61131-3 development environment, and CODESYS Control Win provides a SoftPLC runtime for Windows. The runtime supports Profinet controller functionality, allowing a Windows PC to be used as the control platform for a suitable Profinet test.

For me, the attraction isn't that this somehow replaces a PLC, because it doesn't. The attraction is that I can get a useful test environment running on equipment I already have on the engineering desk.



PROFINET IS STANDARDISED, BUT CONTROLLERS AND ENGINEERING ENVIRONMENTS CAN STILL DIFFER IN HOW PARTICULAR SITUATIONS ARE HANDLED.

Because the application is developed using IEC 61131-3 languages, the test program can be as simple as it needs to be. There is no reason to write a complicated control application just to toggle a few outputs and monitor some inputs.

GETTING STARTED

The actual setup is reasonably straightforward.

1. Create the CODESYS project

Create a new project and select CODESYS Control Win as the target. At this point, we're essentially creating a small SoftPLC application on the PC.

The beauty of CODESYS is that the test application doesn't need to be elaborate. A few lines of Structured Text can be enough to exercise the device.

2. Import the GSDML

Next, import the GSDML file for the device being tested. This is one of the first useful checks. If the GSDML doesn't import correctly, or the modules and submodules don't appear as expected, you've already found something worth investigating before you get any further.

The GSDML is effectively the device's description to the engineering system. If the configuration doesn't make sense at this point, there is little value in moving on to more complicated testing.

3. Configure the device

Add the device to the Profinet configuration and select the required modules and submodules.

The device name and network configuration then need to be assigned appropriately. This is also a good point to check the physical network.

A surprising number of 'Profinet problems' turn out to be something much simpler — the wrong network adapter, a firewall, a VPN connection or the PC using an interface that wasn't intended for the test.

When I'm testing on a laptop, I like to keep the test network as simple as possible. >>





4. Write a small test program

You don't need a machine application: you just need enough code to exercise the device.

For example, a simple Structured Text program can toggle an output at a known interval while monitoring the input data coming back from the device. You can then expand the test as required.

If the device has several I/O modules, test them individually. If it provides diagnostic information, deliberately create an appropriate condition and see what the controller reports. The important thing is to make the test repeatable.

5. Run the test

Once the application is downloaded and the CODESYS runtime is running, the PC can act as the Profinet I/O controller.

At this point you're looking for the basics:

- Does the device establish communication?
- Does cyclic data exchange start?
- Are the configured inputs and outputs behaving correctly?
- Are diagnostics reported?

- Does the device recover correctly after a restart?
- Does changing the configuration produce the expected result?

For a straightforward device, this gives you a useful amount of information without first building a complete PLC test system.

WHERE THIS APPROACH IS PARTICULARLY USEFUL

I see three obvious applications for this scenario.

Device development

If you're developing a Profinet device, you can use the setup during development to check basic communication and configuration before moving to more formal testing.

It can be particularly useful for finding problems in the GSDML or in the way the device handles its modules and cyclic data.

Integration work

For an integrator, the ability to test a device before it reaches site has obvious advantages.

If a device doesn't behave as expected on the bench, it's much easier to investigate it there than when you're standing in front of a machine waiting for production to start.

Troubleshooting

It can also be useful when troubleshooting.

If a device isn't communicating with a user's PLC, putting it onto a separate test setup can help answer an important question:

Is the problem with the device, or is it somewhere in the user's control system or configuration? It doesn't necessarily give you the answer immediately, but it gives you another controlled environment in which to investigate.

WHAT THIS TEST DOES NOT PROVE

This is the important bit: a PC running CODESYS is a useful test tool, but it is not a magic Profinet validation system.

It is not a deterministic real-time test platform

CODESYS Control Win runs under Windows and is described by CODESYS as having soft real-time properties.



iStock.com/Quique Oliver Gomez

That distinction matters, because Windows is doing Windows things in the background, and other applications, drivers and network activity can affect timing.

So if you're trying to prove tight cycle-time performance, jitter or deterministic behaviour, this is not the platform I'd use as the final reference. Use appropriate real-time hardware for that job.

It is not an IRT test

Profinet RT and Profinet IRT are not the same thing. A Windows-based Control Win test should not be used to validate IRT performance or applications where the deterministic characteristics of IRT are fundamental to the application.

Again, use the appropriate hardware and test environment for the requirement you're trying to prove.

It is not formal Profinet conformance testing

This distinction is important: if a device communicates successfully with CODESYS, that tells you something useful about its functional behaviour with that controller.

It does not mean the device has passed Profinet conformance testing.

Formal conformance testing has its own requirements and should be carried out through the appropriate testing and certification process. Think of this approach as engineering validation, not certification.

One controller is not every controller

This is another reason I wouldn't stop testing here.

Profinet is standardised, but controllers and engineering environments can still differ in how particular situations are handled. Startup behaviour, diagnostics, configuration and some edge cases can expose differences. So if a device is intended to work with a particular PLC platform, I'd still test it with that platform.

The CODESYS test gives you another piece of evidence. It doesn't give you universal interoperability.

DON'T FORGET THE TEST ENVIRONMENT

One of the more interesting things about using a PC for Profinet testing is that the PC itself becomes part of the problem:

- Multiple network adapters can cause confusion.
- VPN software can interfere with the network path.
- Firewalls can prevent the communication you are expecting.
- Device discovery can become frustrating when the wrong Ethernet interface is being used.

So if something isn't working, don't immediately blame the device, but start with the basics:

- Which network adapter is CODESYS using?
- What IP configuration does the PC have?
- Is another adapter active?
- Is a firewall blocking the required traffic?
- Is the physical connection correct?

I've spent enough time troubleshooting industrial networks to know that the simplest explanation is often worth checking first.

HOW FAR SHOULD YOU TAKE IT?

How far you take it depends entirely on what you're trying to prove.

For a basic functional check, a PC-based SoftPLC can be extremely useful, but for



FOR EARLY-STAGE PROFINET DEVICE TESTING, TROUBLESHOOTING AND BENCH VALIDATION, A SOFTWARE-BASED I/O CONTROLLER CAN BE A VERY PRACTICAL ADDITION TO THE ENGINEER'S TOOLBOX.

more demanding testing, you need to move up the scale. That might mean testing with the actual PLC platform used by the user, testing network redundancy, checking specific Profinet features, performing long-duration testing, or moving to a real-time platform where timing behaviour matters. And for a product that needs formal certification, there is no shortcut around the appropriate conformance process.

The mistake is not using a PC-based test: the mistake is assuming that one test proves everything.

A USEFUL TOOL FOR THE ENGINEERING TOOLBOX

I like CODESYS for this sort of work because it removes a lot of unnecessary barriers between the question and the test.

I don't have to turn a simple device check into a PLC project — I can create a small IEC 61131-3 application, configure the Profinet network, connect the device and start looking at what is actually happening.

That's useful engineering; it means I can find problems earlier, test devices away from the production environment and get a better understanding of how a device behaves before it becomes part of a larger system. And that's really where I see the value of this approach.

It's not about replacing the PLC. It's about having another tool available when the PLC isn't what you need. For early-stage Profinet device testing, troubleshooting and bench validation, a software-based I/O Controller can be a very practical addition to the engineer's toolbox.

NEWPRODUCTS

INDUSTRIAL 5G GATEWAY

The Advantech ICR-1745 is an industrial connectivity gateway designed to connect IP devices and serial buses directly to 5G NR networks. Built for low-latency communication and reliable wireless performance, the ICR-1745 supports industrial M2M and IoT applications requiring real-time data transmission, including environmental monitoring and surveillance.

Leveraging 5G NR technology, the ICR-1745 is designed for fast and responsive data exchange for industrial applications where low latency and high availability are critical.

The ICR-1745 combines essential industrial interfaces in a compact form factor, including five Gigabit Ethernet ports, RS232 and RS485 serial connectivity, and digital I/O (one DI, one DO). Secure communication is supported through VPN tunnels using multiple protocols. Built-in diagnostics provide continuous monitoring of wired and wireless connections, automatic recovery after connection loss and a hardware watchdog for reliable autonomous operation.

Part of the ICR-1700 series, the gateway uses a system-on-module architecture with ICR-OS integrated directly on the cellular module. This approach supports open Linux-based user applications developed in scripts or C/C++. Selected RouterApps can also be deployed to extend firmware functionality using Advantech's application library.

For large-scale deployments, the ICR-1745 is supported by WebAccess/DMP for device provisioning, monitoring, firmware management and centralised VPN administration.

Advantech Australia Pty Ltd
www.advantech.net.au



WIRELESS DATA LOGGER

The Isoil MV155 is a multi-parametric wireless data logger that can be powered by lithium or alkaline batteries or by an external source.

Due to its shape, reinforced PA6 nylon case and MIL connectors, it is suitable for installation outdoors or in aggressive environments, where it maintains IP68 protection. It can be configured with different combinations of digital and analog inputs, monitoring flow rate, pressure, temperature and fluid level, while providing power to external sensors. It has a high logging capacity, which can be downloaded to a PC.

Offering a 4G connection (with optional DNP3 protocol) it can send the stored data via e-mail, SMS or via FTP/S, easily interfacing with our Isoil's ISOD@M system or with third-party systems.

The encrypted data transmission guarantees maximum security and an intrusion alarm function gives instant alerts via SMS and other wireless protocols.

AMS Instrumentation & Calibration Pty Ltd
www.ams-ic.com.au



INDUSTRIAL EVENT CAMERA

The Pepperl+Fuchs VOC Industrial Event Camera is designed to provide event-driven video intelligence to support rapid diagnostics and minimise costly downtime.

Engineered for continuous operation, the camera provides 24/7 monitoring via an intelligent ring buffer that stores up to 900 seconds of footage. When a predefined trigger event occurs, it automatically saves the 900 seconds before and after the incident — delivering a complete 1800-second recording for analysis of the situation. The system captures high-quality Full HD video and detailed 12 Mp images, all with timestamps for easy reference. Additional context such as error codes or system messages can be integrated into recordings via UDP text overlays, enabling faster identification of root causes and improved process transparency.

Designed for flexibility, the VOC Industrial Event Camera supports a wide range of trigger options, including digital input, REST API, and motion or brightness detection in advanced versions. The Performance model also includes human detection for enhanced safety monitoring in sensitive areas. Built for demanding industrial environments, the camera features IP65-rated protection and operates reliably in temperatures from -30 to +50°C. With HTTPS encryption, privacy masking and optional face blurring, it is designed to provide robust cybersecurity and data protection.

Pepperl+Fuchs (Aust) Pty Ltd
www.pepperl-fuchs.com



How innovation can be used to produce better outcomes for industry

*Harry Mulder, Principal Automation Engineer,
Beckhoff Automation*

We live in a cost-conscious world! Ever-increasing global competition has meant that improving cost efficiency remains a high priority for industry. However, as many costs are fixed or unavoidable, it seems innovation holds the key to further improving what we produce.

The vast majority would agree with the need for streamlining, but the trouble is that most simple solutions have already been tried and implemented. The 'low hanging fruit' has already been picked off. We need to look towards newer, more innovative ideas to further enhance what we do.

One area that's received surprisingly little attention over the years has been the enclosures used to house control equipment. These bulky and costly cubicles have been seen as an indispensable part of control systems and switchboards.

Yet they have numerous inherent drawbacks. Cooling is problematic with fan ports breaching protection ratings and filters requiring regular manual cleaning. Fault-finding is also difficult as visual inspection of status LEDs and product bar codes for web links are hidden behind closed doors. But the biggest bugbear remains the inability to expand beyond the limits of the enclosure once it's at capacity.

It's also amazing that more questions haven't been directed at the wiring within control cabinets. Currently, wiring up a control board is a labour-intensive task that must be carried out by a qualified electrician. So much so that it's been estimated that up to 50% of resources needed to build a cabinet are consumed by wiring!

While these factors may seem insurmountable, we can still ask if there are any alternatives to traditional enclosures. Can innovation help us achieve our goals of greater efficiency at reduced cost? Affirmative answers are starting to emerge.

PLCs produced in a 'cabinet-free' format are starting to become available. These incorporate drives and can be directly mounted on a wall, without any enclosure. The systems achieve an IP67 protection rating by methods such as using chrome-plated componentry that has been varnished for further protection and better heat dissipation. This level of protection allays any concerns about oil spillages or wash downs at the conclusion of every shift.

Interconnections between devices is done through the bus to reduce or eliminate wiring. External devices, such as motors and sensors, are connected via environmentally appropriate plugs and sockets, which can be inserted and removed by staff not qualified for electrical work.

Utilising such innovation overcomes numerous drawbacks inherent with conventional control cabinets: the most obvious being the cost advantage of not having an enclosure. But the lack of an external container also means the system can be expanded at will, limited only by the wall space available. Heat dissipation is also improved and there's easy access to LEDs and barcodes for fault-finding.

OEMs are particularly appreciative of any simplification of wiring as each system they produce needs to be wired individually and economies of scale aren't possible.

While cabinet-free solutions aren't suitable for every application, they are nonetheless a good example of how new technologies can be applied to make a real difference. It's important these sorts of innovations at least be considered for future projects, as they seem our best hope of improving what we do, without compromising quality or functionality.

WHAT'S ON?

October

International Mining and Resources Conference + Expo (IMARC)

27–29 October 2026

ICC Sydney

<https://imarcglobal.com/>

IICA Technology Expo Gladstone

28 October 2026

Gladstone Entertainment Convention Centre

iica.org.au/Web/Web/Events/Event_Display.aspx?EventKey=IICAGLAD26

All Energy Australia

28–29 October 2026

Melbourne Convention and Exhibition Centre

www.all-energy.com.au/en-gb.html

November

IICA TÜV Functional Safety Engineer SIS Training — Brisbane

10–13 November 2026

The Sebel, Brisbane

iica.org.au/Web/Web/Events/Event_Display.aspx?EventKey=TUVBNE2026

IICA Technology Expo Devonport

12 November 2026

Paranple Convention Centre, Devonport

iica.org.au/Web/Web/Events/Event_Display.aspx?EventKey=IICADEVON

2026 Beamex User Group

17–18 November 2026

Ramada Marcoola Beach, Sunshine Coast

www.ams-ic.com.au/beamex-user-group-2026/

IICA Technology Expo Adelaide

25 November 2026

Adelaide Showground

iica.org.au/Web/Web/Events/Event_Display.aspx?EventKey=IICA26ADEL

March

Energy Exchange Australia

2–4 March 2027

Perth Convention & Exhibition Centre

exaexpo.com.au

Workplace Health & Safety Show

17–18 March 2027

Brisbane Convention & Exhibition Centre

whsshow.com.au/brisbane

THE ROLES OF THE VENDOR AND EPCs IN THE PROJECT BIDDING PROCESS

In my experience, engineering projects are bid most efficiently when the EPCs (engineering, procurement and construction companies) provide quality process data to the automation vendor's experts. EPC engineers have limited hours within their project budget to complete a design and when insufficient information is provided the vendor then responds with a long list of technical queries before the appropriate options can be selected.



It therefore becomes the role of the vendor to coach the EPCs on the correct information to provide. If the vendors coach their EPCs on the selection criteria for their equipment, it will involve defining what each criterion means, the applicable standards, and what meaningful responses to the selection criteria there are. Only then will the end user will receive fit-for-purpose selections.

Vendors understand that perfect information is not always available at the design phase. Unless the project's applications are groundbreaking, which is rarely the case, the vendor's experienced experts are likely to have seen the application before. In the case of Australia's mining industry, it's highly likely that the project will be related to alumina, gold, copper, silver (or as a mixed poly metal), lithium, iron ore, nickel or coal.

For typical valve bids that are executed we typically see a 98% success rate when good information is provided. It's a rare case that 100% of valves will work flawlessly from day one, whereas each plant, albeit the same process as another one, will always have its own subtle differences to another plant using the same process.

When poor data (or no data) is provided, the likelihood of successful selection of the correct equipment significantly reduces. In the valve business, the selection criterion that is most often not considered during the design phase is cycle rate. To not consider the cycle rate is to do so at your peril: low cycling (not cycled for weeks or months) and high cycling (i.e. every 45 mins) have become significant pain points for many process plants. It is important to always consider cycle rate on every valve project.

Process plants that are built to a price point, generally under fixed price EPC contracts, with a one-specification-fits-all valve selection usually result in significant pain for the end user in the years following start up – and in my experience, to replace all not fit-for-purpose selections with proper selections is a 10-year process. Easily executable improvements get squeezed into maintenance budgets whereas more significant ones enter the slower capital cycle, awaiting their turn for execution.

Having worked for all three parties in the process plant industry – end users, EPCs and vendors – I can say that it is important to engage your vendors, ask as many questions as you need to understand the options, and have your vendors coach you as necessary. Your vendors really do want you to succeed. Don't blindly put the most economical selection into every application as the pain will be felt for years to come.



Tim Howe is Knife Gate Valve Business Development Manager ANZ at Emerson, and is a Chemical Engineer who has spent the last 10 years in the mining valves space. Tim places a focus on creating meaningful symbiotic relationships with EPCs working on projects within the ANZ mining industry.

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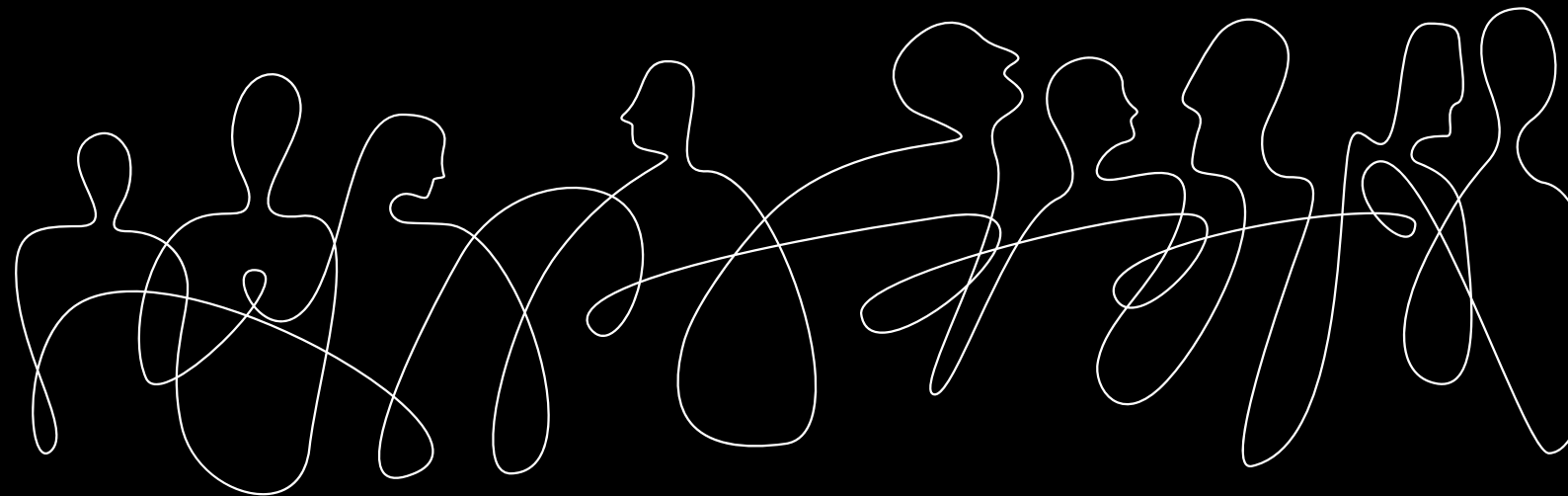
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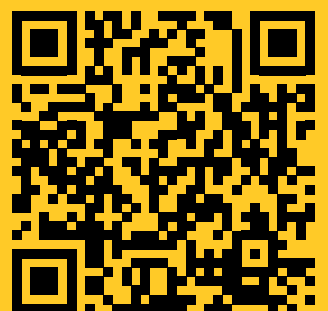
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