

WINI PT

August 2015 vol.29 no.3
PP100007403

**WHAT'S NEW IN
PROCESS TECHNOLOGY**

**AUTOMATION + CONTROL +
INSTRUMENTATION**



**Optimise Availability of Temperature Monitoring
and Control with Dual Inputs, Advanced Diagnostics.**

 **MOORE
INDUSTRIES**
WORLDWIDE

8 NEW FLUKE INFRARED CAMERAS

Up to 2.5 times¹ more pixels

Starting at \$1,645.00

FLEXIBILITY OF CHOICE

Manual or fixed focus

SECURELY STORE AND MANAGE YOUR IMAGES.³

- WiFi upload to Fluke Cloud™ storage
- Free storage² with Fluke Cloud™ storage
- Share images in real-time with Fluke Connect®
- Removable 4GB micro SD card
- Voice annotation

BETTER IMAGE QUALITY

2.5 times more pixels¹
70% better Distance-to-Spot¹

CREATE AND EMAIL

REPORTS from the jobsite with Fluke Connect®

See the **DIFFERENCE.**



www.fluke.com.au

¹ Compared to the Fluke Ti1XX Infrared Cameras

² 5GB of free storage

³ Within your provider's wireless service area

Recommended Trade Price listed excluding GST

Contact Fluke Australia for a free product demonstration



www.fluke.com.au



+61 2 8850 3333



auinfo@fluke.com

FLUKE

WHAT'S NEW IN
PROCESS TECHNOLOGY
AUGUST 2015

ON THE COVER



CONTENTS

- 4 **Selecting the right safety logic system**
- 8 **New products**
- 10 **Hot products online**
- 18 **Five reasons to switch to distributed modular I/O**
- 30 **Big data in manufacturing**
- 40 **Accuracy and repeatability in linear motion systems**
- 50 **As I see it**
Remote access today



The THZ³ and TDZ³ Dual Input Smart HART temperature transmitters have features that increase availability and functionality, along with the industry-leading durability and reliability found in all Moore Industries products. When critical processes rely on continuous and reliable temperature measurements, the THZ³ and TDZ³ dual sensor input capability keeps processes running with a backup and failover protection feature. One sensor or input is programmed as the primary measurement, with the secondary input acting as a backup sensor in case of primary sensor failure. The dual sensor input capability also allows average and differential measurements, which makes it possible to average the two input measurements or select the differential (A-B or B-A) or absolute differential between the inputs.

Built-in device intelligence provides the ability to simulate sensor input before committing to installation, provide alerts on faulty sensor conditions and prevent unwanted alarms to help increase process uptime and availability. The THZ³ and TDZ³ checks and provides alerts when the sensor is drifting out of its preset range or when sensor resistance levels drastically change from corrosion, which can be an early indication of sensor failure. Visit the website to learn more and download the data sheet at www.miinet.com/thz3tdz3.

Moore Industries Pacific Inc
www.miinet.com

NOW in DIGITAL!

Your copy of *What's New in Process Technology* is now available as an online eMag.
www.processonline.com.au/magazine

MOORE INDUSTRIES
WORLDWIDE

SELECTING THE RIGHT SAFETY LOGIC SYSTEM

*Brian Taylor and Tim Roback, Rockwell Automation**

Understanding the complete spectrum of safety logic systems can help ensure you choose the right system for your application.





Machinery safety systems have evolved over the decades from strictly hardwired systems, where safety and standard logic were always separate, to the multifaceted spectrum of programmable systems that exists today, with varying levels of cost, complexity and wiring methods.

When designing safety into your machinery, you need to ensure compliance with today's more stringent standards, but you also must factor in how safety will interplay with productivity to keep downtime to a minimum. You also likely need to consider how flexible and scalable your safety system will be to keep up with your operations as they expand or evolve.

This article will cover the wide array of safety logic systems that are available today, discuss the pros and cons of each, and provide guidance to help you determine which system is right for your application.

Pivotal changes

A combination of contemporary safety standards and advances in safety technologies has brought machinery safety to the connected, information-enabled state that it exists in today.

The implementation of ISO 13849 and IEC 62061, and the withdrawal of EN 954-1 in 2011, ushered in a new era of safety standards. EN 954-1 specified safety-function characteristics and performance categories, but it didn't require risk to be measured using quantitative calculation. Today's more rigorous standards require you to assess and document the reliability of a safety system by adding quantitative calculations to your design. This includes proving component reliability (mean time to dangerous failure) and common-cause failure fractions (design, wiring and assembly issues that could cause system failure).

As a result, these new standards allow for a more methodical risk-assessment process. When combined with the latest programmable safety technologies, machinery can achieve more predictable performance, greater reliability and bet-

ter return on investment (ROI). This is all helping manufacturers improve the bottom line without losing sight of safety.

Your challenge is to select the best, most cost-effective safety system that ensures compliance while also maintaining optimal production capability and flexibility.

Out with the old

Compare a legacy safety system to the more advanced safety systems brought to the market today — the differences are night and day.

Legacy safety systems consist of standard programmable logic controllers (PLC), with each input, logic and output safety device hardwired. The significant amount of wiring involved in these systems makes installation more complex, resulting in longer start-up times and more difficult system upgrades. Additionally, legacy systems lack diagnostics. As a result, troubleshooting takes more time during downtime events because technicians need to manually locate the problem, identify the root cause and then fix the issue. Meanwhile, production remains at a standstill while this takes place.

The contemporary electronic safety systems that are replacing these dated systems deliver a streamlined architecture, meaning that safety applications can be programmed using the same software as your control and motion systems. Such integrated safety systems can help you optimise safety, enhance productivity and reduce costs in multiple ways:

- **Simplified wiring:** I/O devices can be directly wired to the safety I/O modules, which communicate to programmable safety systems via a single network cable, to reduce your wiring costs and improve installation times.
- **Improved productivity:** Flexible programming allows engineers to create maintenance modes of operation, such as safe speed or partial shutdown, to minimise machinery downtime.
- **More advanced diagnostics:** Detailed information can easily be made available to operators and maintenance technicians so they can immediately identify the location and root cause of a safety event.



THE FULL RANGE OF SAFETY LOGIC SYSTEMS WILL CONTINUE TO PROVIDE EFFECTIVE AND AFFORDABLE SAFETY FUNCTIONALITY FOR THE FORESEEABLE FUTURE, BUT MANUFACTURERS AND INDUSTRIAL OPERATORS ARE MOVING TOWARDS AN INTEGRATED SAFETY APPROACH BECAUSE OF THE OVERALL MACHINERY PERFORMANCE BENEFITS THAT IT CAN PROVIDE COMPARED TO MORE CONVENTIONAL ARCHITECTURES.

- **Greater flexibility:** Uptime-enhancing strategies, such as zone control — in which an area that is being serviced either stops or comes to a safe speed while unaffected production areas continue to operate as normal — are easier to both implement and expand.

The spectrum of safety logic systems

Safety logic systems are scaled from simple single-input relays to more comprehensive integrated safety systems. Choosing the right system can be difficult, as there are a number of considerations that you need to factor in:

1. Category or Performance Level (PL) requirements
2. Functional requirements
3. Control requirements
4. System size and footprint
5. System complexity and logic requirements
6. Process complexity
7. Zoning requirements
8. Safety monitoring, diagnostics and information
9. Documentation, validation and reporting
10. Cost

The following overview of safety logic systems is intended to help guide you through the decision-making process.

Safety relays

Safety relays are ideal for minimal zone control with local hardwired I/O. They use simple safety logic, with little to no motion control capabilities. A range of safety relay options is available, from basic single-function and single-input relays to more advanced configurable safety relays, for a range of safety functions.

- **Pros:** Cost-effective solutions for your simplest safety functions.
- **Cons:** Less flexible, less cost-effective and more physically burdensome for larger systems with several zones and safety inputs.

Safety relays are available in three basic types: single- and dual-input standalone

relays; modular safety relay systems; and configurable safety relays.

Single-input relays are designed for relatively small safety applications and simple machines needing single zone control. These devices are limited to providing local diagnostics using LED indicators. Nowadays, gateway devices are also available to transfer diagnostic information to higher level devices and HMIs.

Dual-input relays combine the functionality of two safety relays into one device. They are best suited for small standalone machines. Any logic used with these relays is usually configured by switches on the relay and is very limited to simple Boolean or time-based functions. Dual-channel relays also generally only provide LED-based local diagnostics.

Sample applications for single- and dual-input relays would be package wrapping, form filling, cutting and slicing.

Modular safety relay systems are expandable single-relay systems that can provide safety control for larger, more complex manufacturing equipment. They allow you to combine multiple input and output modules per base unit to support multiple safety devices, including mats, light curtains and switches, and to enable zone control. Modular safety relay systems will usually have some type of backplane or bus and a master module to aggregate or control the information between individual relays, and they also offer diagnostic and communication functionality, and can provide error statuses to an HMI on a fieldbus network.

Sample applications for modular safety relays would include package palletising and carton filling.

Configurable safety relays are more flexible and easy to use, and are suitable for applications that require multiple safety circuits and control of several zones. These relays allow engineers to create, control and monitor the safety system in the same software environment as the standard controller, which reduces your programming time and can help increase productivity.

They also offer more advanced connectivity than other relays, with embedded communication capabilities that enable users to easily perform partial or conditioned shutdowns. Significantly, more information is available to the user, including I/O values, logic status and diagnostics. Diagnostic data can be communicated to controllers or graphic terminals, and local diagnostics are often available using LEDs or simple displays.

Sample applications for configurable safety relays would also include package palletising and carton filling.

Programmable safety controllers

A general-purpose programmable safety controller can provide more advanced safety functionality for safety applications that require some complex logic, where a safety relay won't quite meet your needs. This could include systems that require multiple safety zones (three or more), distributed safety I/O or interlocking with other safety controllers.

It also can be a better fit for systems where a safety PLC would be excessive. This could include instances where a safety network is all that is needed, or when simple and uncomplicated software is desired.

- **Pros:** Cost-effective 'middle' solution for safety applications that land between a safety relay and an integrated safety system; ideal when there is an existing, standard machine controller and you want to add safety.
- **Cons:** Lack of advanced HMI diagnostics is cumbersome for large systems.

Sample applications for programmable safety controllers include loading/unloading bays and sealing and converting machines.

Integrated safety systems

Integrated safety systems are the best solutions for safety applications that require advanced logic. They are ideal when a large physical space needs to be safeguarded or when you need a modular

and scalable system. These controllers are designed for systems that have more than three zones of control, multiple axes of motion control and high I/O counts, including up to 250 dual-channel inputs and 100 outputs.

An integrated safety system uses dual processors to run all of your standard control functions and your safety control functions simultaneously, from a single safety PLC platform. Safety memory should be able to be locked and protected so it can't be modified, while all standard functions (motion, drive, sequential and process) work as they would on a regular controller.

Standard logic and external devices can read safety memory within an integrated safety system, allowing you to display safety status on HMIs, displays or marquees. Multiple safety PLCs in an integrated safety system can share safety data for zone-to-zone interlocking, and a single safety PLC can use remote distributed safety I/O between different cells or areas.

- **Pros:** Best suited for large, complex and integrated systems; incorporates safety and standard control and I/O into one controller, providing more advanced and flexible safety functionality and greater connectivity; also offers the most advanced HMI diagnostics.
- **Cons:** Most expensive option, but this increased cost is often offset by reduced wiring efforts/costs and reduced panel space, as well as improved diagnostics, flexibility and productivity.

Sample applications for integrated systems include integrated packaging and bottling lines, flexible automotive assembly lines, metal forming and coating lines, printing presses.

The integrated future

The full range of safety logic systems will continue to provide effective and affordable safety functionality for the foreseeable future, but manufacturers and industrial operators are moving towards

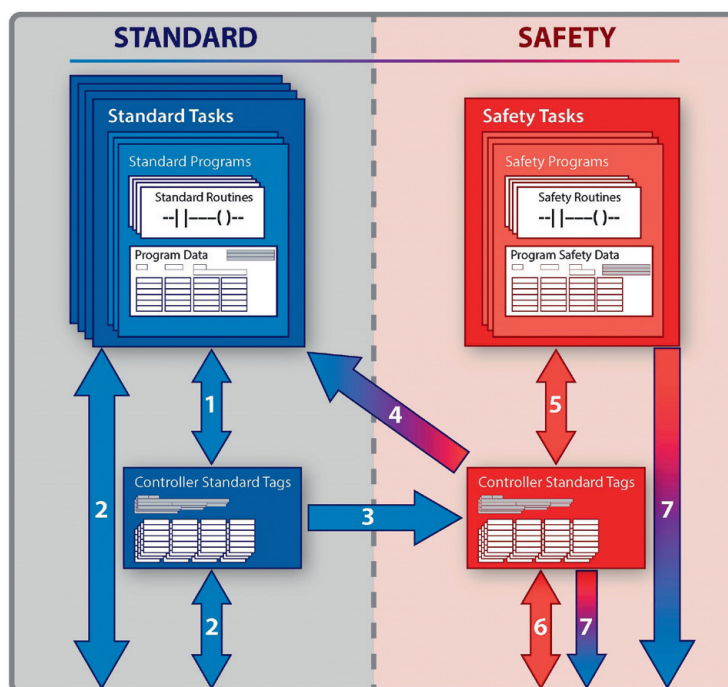


Figure 1: Integrated safety.

an integrated safety approach because of the overall machinery performance benefits that it can provide compared to more conventional architectures.

Integrated safety systems can do more than optimise safety in your plant. They can also help improve machinery uptime and serve as productivity enhancers. Integrated safety technologies can help reduce the amount of time it takes to design, program and start up a system. They can simplify your wiring demands and network integration, and they can better accommodate future safety changes compared to hardwired systems.

According to a recent Aberdeen report, best-in-class manufacturers are 48% more likely than their competitors to integrate their safety systems with their plant-floor automation systems. With the help of these investments, best-in-class manufacturers (the top 20%) achieved a 90% overall equipment effectiveness (OEE) rate, a 0.2% repeat accident rate and a 2% unscheduled asset downtime rate. On the other hand, laggard performers (the bottom 30%) achieved a 76% OEE rate, a 10% repeat accident rate and a 14% unscheduled asset downtime rate.

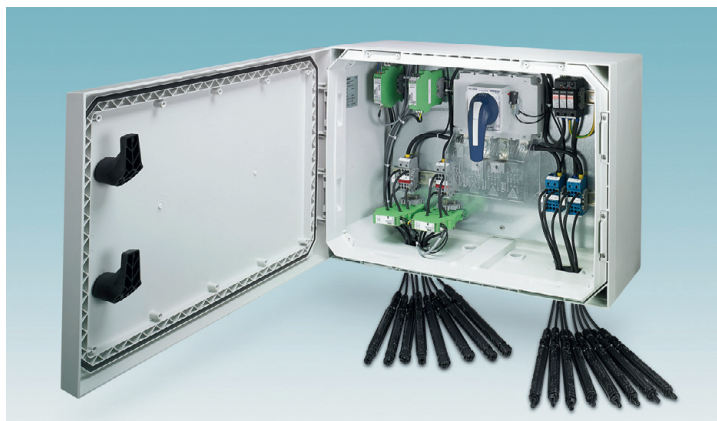
Conclusion

Safety standards and technologies will continue to evolve, and the future points to more options and more flexibility to apply safety technology to meet specific needs. As safety and standard components continue to become more seamlessly integrated into control system designs, implementing safety should no longer be a separate discipline, but rather a concurrent and more fundamental part of the design process.

Regardless of the application, carefully evaluating the risks and determining appropriate mitigation strategies in the early stages of machine design will help engineers and maintenance professionals select the right safety solution. In turn, making safety a more natural part of the design process will help you keep employees and machinery safer while helping to improve the bottom line.

**Brian Taylor is Safety Components Business Director, while Tim Roback has the title of Safety Marketing Manager at Rockwell Automation.*

Rockwell Automation Australia
www.rockwellautomation.com.au



COMBINER BOXES

The latest generation of SCB Compact string combiner boxes with inline fuses from Phoenix Contact is even smaller, more flexible and more powerful.

Contrary to conventional solutions, string protection is achieved outside the control cabinet. This change reduces the thermal stress inside the connection box, since it allows the fuses mounted on the outside to release their waste heat into the environment. The inline fuse and all other components in the string combiner box, such as the circuit breaker, surge protection and monitoring system, are exposed to lower operating temperatures. Over the long term, this means better performance and longer service life for the entire system. It also allows operation at higher ambient temperatures.

Moving the fuses to the outside makes the design of the new connection boxes significantly smaller. The lower volume reduces transportation and storage costs. The string combiner box's light weight means that a single person can install it.

Phoenix Contact Pty Ltd
www.phoenixcontact.com.au

ACTIVE POWER FILTER

Modern industry depends on automated processes and modern technologies which present nonlinear loads to the power system and contribute to a host of systemic power distortion issues, such as damaging voltage fluctuations, reactive power events and harmonic distortion. These issues can result in increased costs, protracted equipment downtime and dramatic energy losses that negate many of the efficiency gains of automation. Power quality assurance has become vital to safeguarding equipment and systems essential to today's industrial and commercial processes.

Delta's APF2000 Series active power filter monitors load current and filters harmonics to maintain a clean line current. Using a 32-bit digital microprocessor, the APF2000 can instantly compensate for all types of harmonics in real time with a response of less than 20 ms. The APF2000 comes in various models with current ratings of 50, 100, 200 and 300 A, and can reduce THD to less than 5% and improve power factor to over 0.96. Operating temperature range is -25 to +70°C at up to 90% RH.

Delta Energy Systems
www.delta-es.com.au



VALVE ACTUATORS

Rotork has updated the IQ3 range of multiturn actuators with updated functionality including a large range of advanced data logging and communication capabilities.

Diagnostic graphics present a window into the process, showing the valve torque, usage profiles and service logs, facilitating real-time analysis directly at the actuator. The backlit display provides multi-functional indication, including user-friendly multilingual menus for configuration and commissioning. Local position indication, valve and actuator status, asset management and diagnostic operating information is available to download and can be viewed directly at the actuator on the LCD display.

Using the Rotork Bluetooth Setting Tool Pro, commissioning and configuring the actuator is faster and simpler, and the tool can also be used to securely transfer data from the actuators to a PC for analysis using Rotork Insight2 diagnostic software.

IQT actuators are suitable for three-phase, single-phase or DC power supplies, with a torque output range of 50 to 2000 Nm available for isolating, regulating and modulating duties. The motor always runs in the correct direction, irrespective of supply type and connection. In addition, the output speed can

be non-intrusively adjusted over a 4:1 range without affecting the output torque. All valve interface bases conform to ISO5211 and are fitted with removable couplings.

Hazardous area actuators are fully approved to the latest IEC Ex standards. Network connectivity options include Foundation Fieldbus, Profibus, HART and DeviceNet open systems, as well as Rotork's own dedicated Pakscan wired or wireless systems.

Rotork Australia
www.rotork.com



fuel up! with red lion



**SPEND OVER
\$2000 & RECEIVE
FUEL VOUCHER \$100**

OFFER 1

**SPEND OVER
\$3000 & RECEIVE
FUEL VOUCHER \$200**

OFFER 2

**SPEND OVER
\$4000 & RECEIVE
FUEL VOUCHER \$300**

OFFER 3

red lion



Spend \$2000 or more on any
Red Lion Ethernet product from
Control Logic and receive
BONUS fuel vouchers*

>> Call 1800 557 705

**STRICTLY LIMITED TIME.
CONDITIONS APPLY.**

*Must be in same transaction. Quote 'Process Mag' to claim. Fuel vouchers are available on all Red Lion Ethernet switch products invoiced between 01/08/15 and 31/10/15. Available while stock lasts. All prices exclude GST. Pictures for illustration purposes only. Not to be used with any other offer. Control Logic reserves the right to withdraw promotion without notice. E.&O.E. Fuel vouchers will be posted at the completion of the promotion.

for more information call 1800 557 705 or email sales@control-logic.com.au
www.control-logic.com.au

control logic

industrial.
electrical.
automation.

HOT PRODUCTS

ON WWW.PROCESSONLINE.COM.AU THIS MONTH



DIGITAL PRESSURE GAUGES

Suitable for field applications as well as calibration laboratories and workshops, Crystal's XP2i digital pressure gauges provide NATA certified accuracy.

TechRentals

<http://bit.ly/1fCcXMg>



ETHERNET-EXTENDED MONITORS

Siemens is extending the possibilities for its industrial flat panel products through the integration of an Ethernet interface.

Siemens Ltd

<http://bit.ly/10qswmu>



MAGNETIC FLOWMETERS

Emerson has announced the addition of Modbus RS485 and a low-power option to its Rosemount 8700M magnetic flowmeter range.

Emerson Process Management

<http://bit.ly/1CMAkO2>

RH TRANSMITTERS

The HygroSmart 280 and 290 series relative humidity transmitters include an interchangeable sensor that shortens routine maintenance.

AMS Instrumentation & Calibration Pty Ltd

<http://bit.ly/1GuELYH>



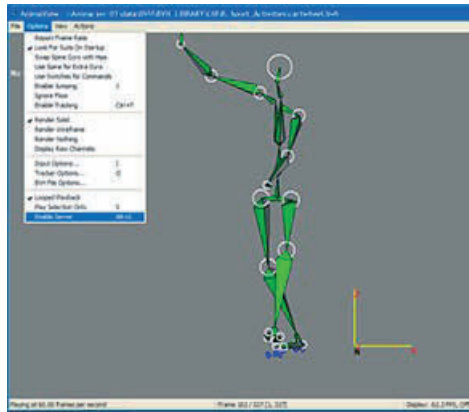
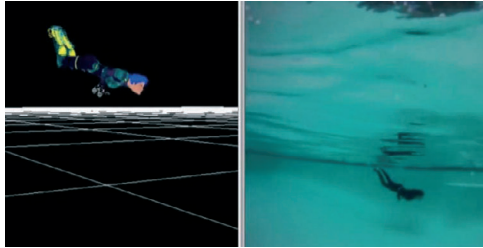
WIRELESS VIBRATION AND TEMPERATURE SENSOR

The Banner Engineering wireless vibration and temperature sensor measures RMS velocity in inches per second or millimetres per second.

Turck Australia Pty Ltd

<http://bit.ly/1Lxq5OZ>

Man-worn optical positioning system



3D Suit Motion Capture System



Thermal Imaging camera for High temperature



Production Line Leak Detector



High precision pressure transducers



Wireless process sensors





LAYER 3 SWITCH

The Oring RGPS-R9244GP+-P is a layer 3, high bandwidth rackmount switch for use in network backbones and high data flow applications.

The switch incorporates current network standards and security measures along with Oring's high industrial standards, build quality, O-Ring redundancy protocol and industrial wide temperature operation.

The RGPS-R9244GP+-P offers four full 1/10 Gigabit SFP Ports and 24 Gigabit RJ45 ports, each offering full 30 W PoE.

With its 128 Gbps bandwidth and layer 3 features the switch suits many applications including plant automation, industrial ITS core architecture switch, IP camera network distribution, network backbone and layer 3 network aggregation.

Ethernet Australia

www.ethernetaustralia.com.au

HMI FOR OUTDOOR USE

The Simatic HMI TP700 and Simatic HMI TP1500 Comfort Outdoor Panels are equipped with a UV-protected device front with an IP65 degree of protection and are suitable for industries such as dairy farming, mining, refrigerated buildings or ships. The devices can be used in a wide range of temperatures from -30 to 60°C and in air humidity levels of up to 90%.

Available in displays measuring 7" or 15", they feature a widescreen 16:9 aspect ratio that displays in up to 16 million colours and can also handle complex process or plant images. A high degree of glare reduction, wide reading angles and automatic dimming allow for reliable and strain-free operator control and monitoring. This allows the user to get a reliable visual of process data in varying lighting conditions.

For optimal use of space in the plant or for special machine designs, the panels can also be installed upright and operated in portrait mode. In the event of a power failure, they ensure maximum data security by storing sufficient energy to exit all active archives without errors and back up the data.

Comprehensive certifications for use in hazardous areas according to Ex2/22, FM Class I Div 2 or for shipbuilding applications are pending. The touch panels are integrated into the automation solution via Profinet and are configured using the Simatic WinCC engineering tool in the TIA Portal (totally integrated automation). Other industrial networking protocols and interfaces consistent with the standard Comfort Panel range are available.

Siemens Ltd

www.siemens.com.au



MODELLING AND OPTIMISATION SUITE

AspenTech recently announced the availability of aspenONE Engineering and aspenONE Manufacturing and Supply Chain Version 8.8 software. Developed for firms in the oil, gas, chemicals, engineering, mining and construction, and other process industries, aspenONE V8.8 features a large number of enhancements.

Enhancements to Activated Analysis in Aspen HYSYS and Aspen Plus improve performance and usability, allowing faster and more optimal design selection earlier in the conceptual engineering phase. aspenONE now also includes relief load calculation enhancements for heat exchanger tube rupture, fire emergency and control valve failure, expand relief sizing and safety modelling capabilities, and the time to conduct pressure relief analysis is generally reduced by 50%.

With the addition of the Cubic-Plus-Association (CPA) fluid property package, V8.8 software now more effectively models methanol behaviour to accurately predict hydrate formation, while naphtha hydrotreating and alkylation models create a complete refinery reactor and assay management suite from within Aspen HYSYS Petroleum Refining.

Polymers can now be treated as solids below their melting points in Aspen Plus, allowing for accurate upstream and downstream modelling of solids production, including dewatering and drying.

Smart Tune technology in Aspen DMC3 enables users to quickly adapt to changing economic scenarios.

The Campaign Manager in Aspen Plant Scheduler enables speedy creation and scheduling of an ideal production sequence or product wheel. Sequencing algorithms further optimise grade transitions to reduce off-spec production and enhance asset utilisation.

Aspen Technology Australia Pty Ltd

www.aspentech.com

READY FOR WHATEVER COMES DOWN THE PIPE



The ST100 Series
Thermal Mass Gas Flow Meter

The most versatile thermal mass gas flow meter... now and in the future.

- Calibrations for more than 200 different gases
- 4 - 20 mA, HART, FOUNDATION™ fieldbus, PROFIBUS, Modbus
- Temperature service to 454 °C [850 °F]
- Pipe sizes from 25 mm to 2500 mm [1" to 99"]
- 100:1 up to 1000:1 turndown
- 4-function: flow rate, total flow, temperature and pressure
- Best-in-class digital/graphical display
- Global agency approvals for Ex locations

FCI FLUID COMPONENTS
INTERNATIONAL LLC

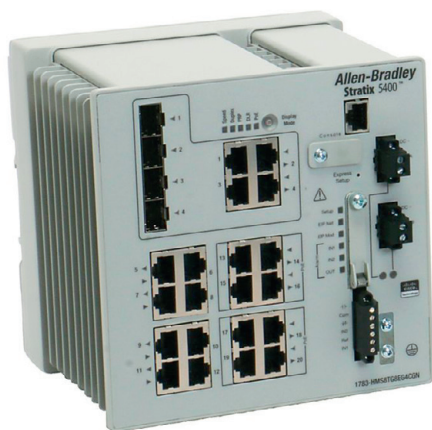
www.FluidComponents.com

AMS

www.ams-ic.com.au

AMS Instrumentation & Calibration Pty Ltd

Unit 20, 51 Kalman Drive, Boronia VIC 3155, Australia
Tel: 03 9017 8225, Fax: 03 9729 9604



ALL-GIGABIT SWITCH

The Allen-Bradley Stratix 5400 switch is an all-gigabit switch that helps manufacturers achieve higher network speeds for their increasingly high bandwidth applications. The switch also supports both Layer 2 switching and Layer 3 routing for a range of network configurations.

When used as a Layer 2 switch, the product is suitable for industrial environments experiencing an influx of high-performance, gigabit-speed end devices, such as IP video cameras and telephony. It is also fit for heavy industry applications that require resilient network topologies. When used as a Layer 3 switch, routing is enabled between segmented networks to help achieve better performance.

The switch uses an all-gigabit design for high-performance network and end-device support. The GE Power over Ethernet (PoE) and additional GE fibre port options enhance scalability and help meet a wide range of application needs.

The product is available in 18 different models and offers up to 20 gigabit ports in a single switch to meet a wide range of application needs. Default configurations help simplify set-up, optimise performance and enable faster diagnostics retrieval. The switch also comes with network address translation to help reduce commissioning time.

Rockwell Automation Australia
www.rockwellautomation.com.au



POE+ SWITCH

Red Lion's N-Tron series NT24k-8TX-POE compact managed Gigabit Ethernet switch features eight 10/100/1000BaseT(X) ports with PoE+ providing a robust solution for transmitting power and data to equipment in harsh environments.

Housed in a compact, hardened metal DIN rail enclosure with redundant 22-49 VDC power inputs, the NT24K-8TX-POE provides up to 30 W of power per port, high shock and vibration ratings and a wide -40 to 80°C operating temperature range.

A fully managed system with plug-and-play operation, it is suitable use for various applications including factory automation, intelligent traffic control systems (ITS), security automation, and transport and building management systems (BMS).

Control Logic Pty Ltd
www.control-logic.com.au

ETHERNET I/O MODULES



The PROMUX TCP modular I/O system consists of standalone digital and analog I/O modules which are connected together on an Ethernet 10/100Base-T network using the Modbus TCP protocol. A 32-bit ARM CPU is used in the modules to provide high-speed data processing and fast communications turnaround times.

The PROMUX TCP modules also have built-in web servers. This enables configuration and diagnostic data to be accessed via a standard web browser.

All PROMUX TCP modules have a minimum isolation of 1500 VAC between the field and logic. The modules have been equipped with status LEDs which are used to indicate the status of the inputs or outputs and to assist with diagnostics.

The I/O capabilities of a PLC can be expanded where the PLC has a Modbus TCP communications facility available. When configured as a Modbus Master, and attached to the Ethernet network, the PLC can use the PROMUX TCP modules as remote I/O, reducing cabling costs and increasing the I/O capability of the PLC.

The PROMUX TCP modules can also be used for distributed data acquisition by connecting a PC with SCADA on an Ethernet network.

Procon Electronics Pty Ltd
www.proconel.com

**Go for
Industrial
Internet !**



**Industrial
M2M Router &
Data gateway**



Flexy

**Discover the first modular
industrial M2M router**

Access, Collect and Monitor your Remote Data

- Multiple extension cards: WiFi, 3G, 4G, LAN, ...
- PLC compliant: EtherNet/IP, DF1, Unitelway, MPI, Profibus, Modbus, Fins, Hostlink, ...
- Integrated services: VPN, Data Logging, Web HMI, Scripting, Alarming, ...

ASSET MONITORING AND ALERTING

Honeywell Process Solutions (HPS) has launched Uniformance Asset Sentinel, designed to continuously monitor equipment and process health — assisting industrial facilities to predict and prevent asset failures and poor operational performance.

Uniformance Asset Sentinel supports the emergence of the Industrial Internet of Things (IIoT) in the process industry, enabling companies to collect, organise and analyse data for a specific asset. These analytics can transform work processes from reactive to proactive, helping industrial plant operators avoid unplanned downtime and improve plant performance and safety.



The technology works by continuously accessing data from a variety of sources, including process parameters, vibration data and alarms. Using a real-time complex event processing engine, Uniformance Asset Sentinel continuously performs performance, health, ef-

iciency and safety-related calculations and compares those results of the current actual performance to an expected performance model. Predicted or detected deviations from these models are used to generate notifications to facilitate investigation and intervention to minimise the cost and frequency of an event.

Uniformance Asset Sentinel's predefined best practice templates for more than 100 equipment types, such as pumps, compressors, exchangers, valves and turbines, combined with its seamless interface to its process design simulation software (UniSim Design) helps customers rapidly deploy equipment or process monitoring on any plant asset, eliminating the need for complex model development.

Honeywell Process Solutions
www.honeywell.com

GRAPHIC TERMINALS

The Allen-Bradley PanelView 800 family of graphic terminals, available in 4", 7" and 10" display sizes, features an 800 MHz CPU processor, up to 256 MB of flash and dynamic memory to reduce boot-up time, making it two times faster than the previous PanelView terminal. The terminals also offer improved touch screen responsiveness and can be configured in portrait and landscape modes for greater installation flexibility.

The graphic terminals are specifically designed for use with the Allen Bradley Micro800 and MicroLogix control systems. The terminals have high-resolution screens with LED backlights and can display up to 65,536 colours. Built-in ethernet and serial communications ports (RS232, RS422 and RS485) support easier controller connectivity, while USB and microSD ports make file transfers easier. The terminals are also certified for Class 1, Division 2 hazardous locations.

The Connected Components Workbench software Release 8.0, which includes support for the PanelView 800 graphic terminals, gives machine builders a common environment to program the Micro800 controllers, as well as to configure the Allen-Bradley PowerFlex drives and Allen-Bradley Guardmaster safety relays.

Release 8.0 includes support for: the Guardmaster 440C-CR30 safety relay ethernet plug-in, for communications to Micro800 and Allen-Bradley CompactLogix controllers; the Micro800 high-speed counter plug-in feedback axis, to ease motion programming; and Micro800 DeviceNet scanner plug-in diagnostics, to ease troubleshooting DeviceNet-connected devices.

Users can also purchase the developer edition, which includes an archive manager to track the project with a time stamp and description, making device management easier.

Rockwell Automation Australia
www.rockwellautomation.com.au



MINIATURE INDUCTIVE SENSORS

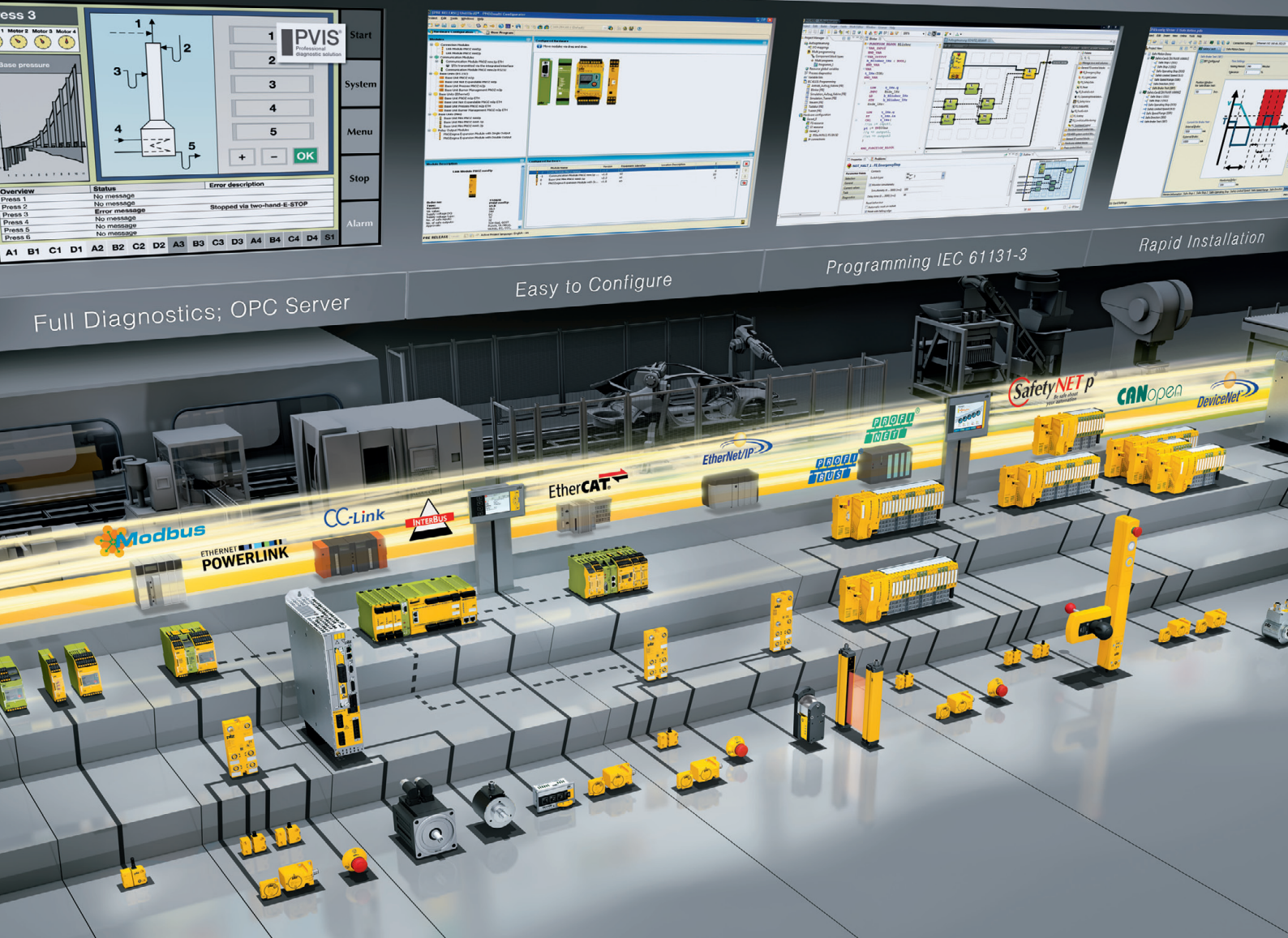
Turck has added the Q4.7 series of rectangular inductive sensors to its range of miniature sensors. The miniature sensors in the new design (16 x 8 x 4.7 mm) have been specially developed for applications in which they have to be fully embedded in metal, such as in the stamping and metal forming industry. These kinds of applications not only require robust sensors with large switching distances, but also a very small housing to reduce the amount of surrounding metal to be removed for the recesses.

The Q4.7 series meets all these requirements with a 2 mm sensing range, a robust metal housing, a highly flexible 2 m connection cable with an oil-resistant sheath and the capability of being fully flush mounted. Turck has managed to house the status LED in the active face so that this, in contrast to side-mounted LED sensors, stays visible even when fully flush mounted.

In order to meet a wide variety of application conditions, the Q4.7 has a temperature range from 0 to 85°C and is IP67 rated.

Turck Australia Pty Ltd
www.turck.com.au





Automation: complete and simple!

PILZ

THE SPIRIT OF SAFETY

- Full diagnostic options for reduced machine downtimes
- Open communication for high flexibility
- Innovative software solutions for easy configuration and programming
- High scalability for individual solutions
- One system for safety and automation

The 4-fold safety
of automation

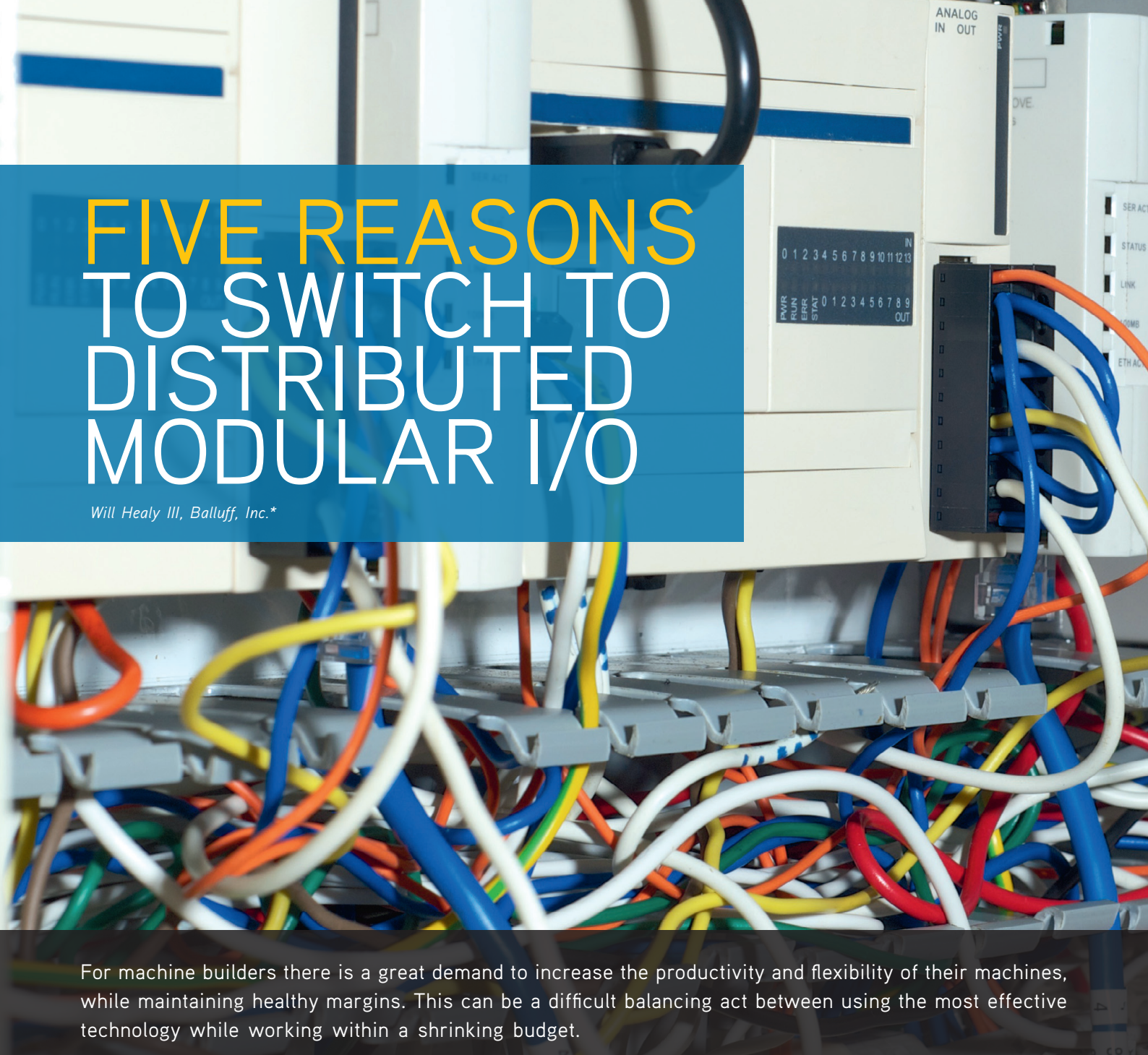
COMPONENTS
SYSTEMS
SERVICES

Technical Ecological
Personal Economical

Visit us at
ACI Connect

Melbourne • Sydney • Brisbane • Auckland

Ph: 1300 723 334 Ph: 03 9544 6300 Fax: 03 9544 6311 www.pilz.com.au safety@pilz.com.au



FIVE REASONS TO SWITCH TO DISTRIBUTED MODULAR I/O

*Will Healy III, Balluff, Inc.**

For machine builders there is a great demand to increase the productivity and flexibility of their machines, while maintaining healthy margins. This can be a difficult balancing act between using the most effective technology while working within a shrinking budget.

Distributed I/O systems connected to an industrial network allow for I/O data to be spread across the machine and outside of the cabinet, reducing the total component and hardware costs of the system. New developments in distributed I/O technology have lowered the cost per point of the controls design and have reduced the time to integrate.

A brief market summary

Discrete inputs and outputs have been the workhorse of industrial automation since engineers first started putting sensors and actuators on equipment. Today, the market demands more information from every level of the manufacturing process. Current sensor technology and controls devices allow for this level of detailed information to be collected; however, the challenge for every engineer is that these controls solutions must be cost-effective and simple to implement.

Interest in industrial networks is growing every year and the main swell of interest is in Industrial Ethernet solutions. How-

ever, many people find there are some major barriers to using an industrial network. Many believe that the cost of implementation and the lack of internal resources present barriers to the deployment of an industrial network solution. This means that end users are looking for Ethernet networks for many reasons including I/O, but they are reluctant because they also need a cost-effective solution.

Cost-effective controls design

The thought of implementing an unfamiliar technology can cause some anxiety for any engineer. That being said, every end user's needs and demands are different; so an engineer today is looking at ways to add upgrades or options to their machine that are easy to implement and are customisable to the level that end users have come to expect. There are three primary challenges in cost-effectively enhancing a machine's design: creating value in throughput or uptime, reducing the total cost of the machine and making the machine distinct among the competition.



© Zlotner/Dollar Photo Club

Our machine is about as fast as it can get.

While most machines are highly productive already, there is always a demand for more throughput. When the limitations are due to mechanical parts or controls on the machine, the reliability and uptime become a point of pain for the end user. Uptime equals real production dollars for all manufacturers and this added value should not be taken lightly. Easy-to-troubleshoot components with clear diagnostic messages allow maintenance crews and operators to get the machine up and running in shorter periods of time, and enable them to implement repairs with less hassle.

The total machine costs just keep going up!

Industrial commodity and material prices are going up, but end users are less willing to pay for these increases — so machine builders are tasked with reducing the cost of engineering, components and machine construction. The quotation process itself can be time-consuming and frustrating. It is important to be able to quote quickly but it is more important to quote accurately. Wouldn't it be great to be able to specify the same controls components no



IN ATTEMPTING TO CREATE A MORE COST-EFFECTIVE MACHINE, WHILE IMPLEMENTING THE MOST EFFECTIVE TECHNOLOGY, MANY ENGINEERS ARE TURNING TO DISTRIBUTED MODULAR I/O SOLUTIONS FOR IMPROVING THEIR THROUGHPUT AND INCREASING THEIR FLEXIBILITY WHILE CUTTING COSTS OUT OF THEIR CONTROLS DESIGN AND IMPLEMENTATION.

matter the PLC or industrial network? In development and installation, the labour costs of manufacture, tear-down and set-up (at the end user) can quickly cut into the margin of a project. So how do you reduce the control cabinet costs? How do you reduce the labour costs of set-up and installation?

How do I make my company and my machines distinct?

Access to real-time data and increased productivity are the two primary operational drivers for an equipment specifier's interest in industrial network solutions. Specifiers are also interested in ease-of-upgrade as well as quality controls — the machine should be able to expand over time or be modified easily to the needs of the individual end customer. But how do I get more feedback, more diagnostics and more data out of my devices? And how do I add flexibility to make the machine distinct from the competition? How have people solved this in the past?

The evolution of distributed I/O

PLC controls have been in use since they gained popularity in the 1970s. Later that decade, demand for distributed controls allowed for inputs and outputs to be collected across the automation process. When looking at the connection between field devices and the I/O there has been an obvious evolution over the last four decades.

Hardwired I/O and junction boxes

Originally there were hardwired I/O devices in which every conductor was individually terminated into the controls cabinet, similar to Figure 1. Each sensor had a cable that was run through a cable tray into the controls cabinet; large numbers of sensors or outputs meant large controls cabinets. Hardwired I/O was characterised by full cable trays and overloaded conduits full of wire. Junction boxes, like the example in Figure 2, helped with this issue to a degree but the same cabinet issues existed. Both of these practices are still active and accepted today in many engineering circles.

Industrial networks

The acceptance of the industrial fieldbus in the early 1990s allowed for control systems to step onto an enlightened path. The ability to communicate intelligently between multiple devices and collect more data than ever before has made an industrial network the next step. As shown in Figure 3, this technology reduces many of the I/O terminations down to a single network cable, allowing for smaller cabinet footprints and simplified hardware installation, right on the machine. I/O data is collected outside the controls cabinet, and with an industrial network more data is available on the process and on the health of the machine.

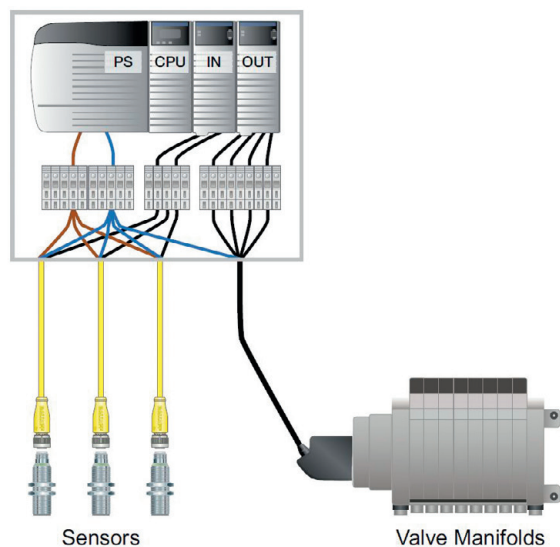


Figure 1: Hardwired inputs and outputs.

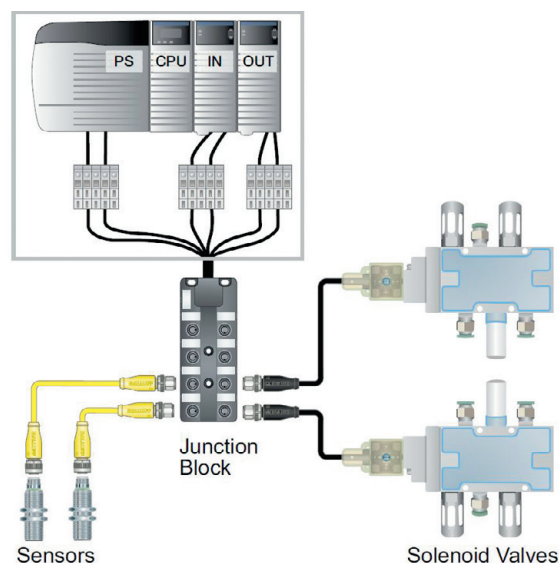


Figure 2: Hardwired junction blocks.

The next evolution

Historically, industrial networks have had strong connections to PLC brands. Only certain PLCs could communicate over certain networks. Each controls device needed to be selected with a single industrial network and controller in mind to ease the integration efforts. There are various types of data needed from the components of a machine: discrete points, analog channels, valve controls, identification data, diagnostic information, etc. A technology that would allow for a network-neutral state of the controls equipment would make a machine builder more flexible and cost-effective in their design and overhead, no matter the industrial network or controller selected by the end user.

The solution: distributed modular I/O

In attempting to create a more cost-effective machine, while implementing the most effective technology, many engineers are turning to distributed modular I/O solutions for improving their throughput and increasing their flexibility while cutting costs out of their controls design and implementation. By using distributed modular I/O solutions, the I/O 'slices' are separated from the network communication and are designed for mounting on the machine in small pockets of distributed I/O.

Different from a block I/O solution, distributed modular I/O is more flexible in the types of data it can collect. While both solutions are set up in a distributed fashion, in a block I/O solution the individual nodes are dedicated to one specific data type: discrete I/O, valve manifolds, identification data, smart sensor configuration. Each data type then requires a node or IP address on the network and requires further network and auxiliary power cabling to be installed. A network utilising distributed I/O alone can expose the network cabling to harsh environments and network failures due to damage. Distributed modular I/O can maintain the industrial

network integrity better by keeping the network connections out of the harshest parts of the manufacturing environment.

Centralised I/O requires many installation and development hours. A distributed modular I/O solution allows installers to quickly set up and test the I/O hardware since it uses standard connectors and familiar devices. Furthermore, a distributed modular I/O solution allows the user to put the exact I/O device precisely where it is needed on the machine, reducing the number of cable runs back to the controls cabinet.

A proper distributed modular I/O solution is IP67 (outside of the cabinet) and can distribute multiple types of I/O data. Discrete I/O, from proximity switches and photoelectric sensors for example, is collected remotely with industry standard quick-connect connectors. It has the ability to space analog I/O signals anywhere on the machine without an analog card in the controller or a long shielded cable run through the equipment to a cabinet. It can interface with a valve manifold or communicate with intelligent sensors and RFID processors. Distributed modular I/O collects all of this information into one IP or node address and communicates directly with the controller over the industrial network.

Five reasons to switch

A number of important benefits become evident when a distributed modular I/O system is implemented into a controls design.

- 1. Simplifies the controls quotation process.** It utilises the same components for I/O regardless of the PLC brand or industrial network selected. Pricing for controls equipment is standardised from machine to machine, which makes calculations easily expandable.
- 2. Opens assembly teams to additional projects.** Building controls cabinets is skilled work and they are time-consuming to assemble, wire and test properly. An IP67 distributed modular I/O solution

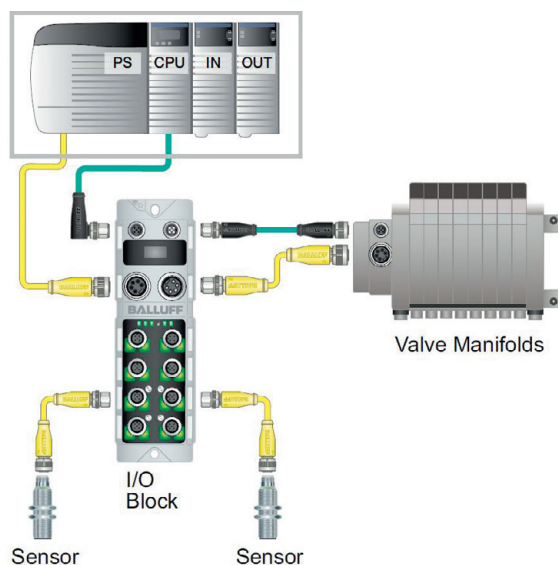


Figure 3: Reducing cabinet space with network I/O.

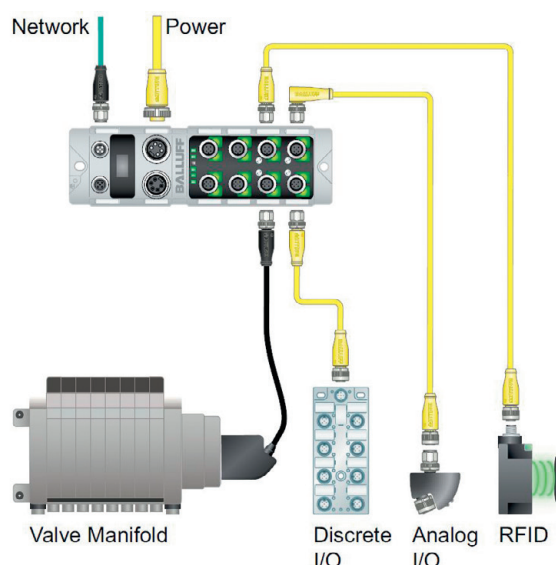


Figure 4: Distributed modular I/O.

can be mounted right on the machine quickly with less labour. Everything is then wired with standard industrial connectors with less time needed for installation. Speed in set-up allows for more projects per year to go through the assembly floor.

3. **Maximises spares.** Most initial designs include a set of spare I/O points for later development or modifications. Whether the customer wants to add a few sensors to the design or add a single channel of analog to the machine, spares and additions to the design can add major cost to the controls bill of materials. With this solution, spare connections can be a flexible placeholder for any type of I/O until the need arises, without adding any controls cabinet space.
4. **Protects network integrity.** One important factor in any machine design is to limit the exposure of the industrial network cabling that runs through the machine. By using a distributed modular I/O solution, the network cabling can be kept out of harm's way and only the individual I/O device cables run into aggressive environments.
5. **Reduces total cost per point.** The labour involved in parallel wiring a valve manifold or terminating a set of discrete sensors is labour intensive. Analog devices can get expensive quickly with shielded cable runs and costly 4-channel analog input cards, especially when there is only a need for one analog channel. Distributed modular I/O reduces the labour required in hardware set-up and can be customised to reduce I/O hardware costs.

How distributed modular I/O works

Think of a remote 'slice' I/O solution. In a typical application, the communication head and the power supply sit on the left-hand side and then they are followed along the backplane by the individual I/O devices. Usually there are a limited number of slots available in the backplane and individual slices of controls components can

be inserted (discrete 24 V input cards or 0-10 V analog cards, for example). In a similar fashion, a distributed modular I/O system has a communications head that talks over an industrial network on one side and collects data as a 'master' device on the right-hand side. In the case of IO-Link, each 'slave' device is connected to an industry standard M12 port utilising a simple 3-wire sensor cable for communication. With the ability to be installed within a 20 m radius from the master device in any direction, slave devices can be easily distributed across the machine, in close proximity to the sensors and actuators that are wired to them.

Utilising a widely accepted open point-to-point technology, IO-Link is fieldbus independent, is easily configured and is vendor neutral. Process data shows up as simple packets of bytes in the controller for easy integration. There is no need to manually go to each device to configure it, reconfigure it or extract asset management information from it — the devices can be quickly configured using simple read/write commands.

IO-Link has been likened to the well-known USB interface. Both are cost-effective serial point-to-point connections for signal and power transmission and are designed for plug-and-play installation. IO-Link offers everything needed to assume a similar role to USB as the installation system for connecting sensors, actuators, controls and display elements in machine building, and offers downward compatibility to non-IO-Link capable standard sensors, immunity to interference as well as the use of unshielded standard 3-conductor cables.

**Will Healy III is a network and connectivity market manager for Balluff North America, based in Florence, KY.*

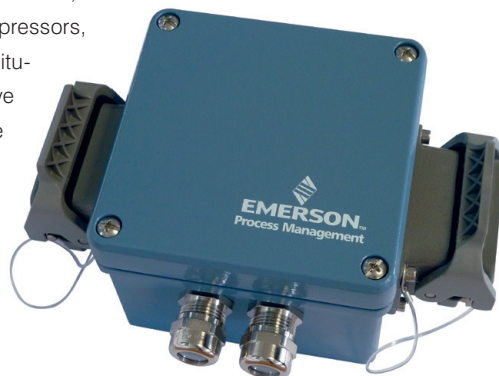
Balluff Pty Ltd
www.balluff.com.au

MACHINERY HEALTH MONITOR

Emerson Process Management has introduced the CSI 3000 Machinery Health Monitor, a compact protection system for a wide range of machinery such as pumps, compressors, centrifuges, blowers and generators. The CSI 3000 delivers protection data in situations where a standard rack-based system will not fit or is not a cost-effective approach. Easy assembly and user-friendly, customisable set-up means the CSI 3000 has a short path out of the box to improving availability and ensuring safety of rotating assets.

The CSI 3000 measures shaft vibration, bearing vibration, position and speed, and generates key signals. The system provides the user with alarm outputs for each channel and does not require additional signal converters for shaft vibration and displacement measurements.

Emerson Process Management
www.emersonprocess.com.au



ETHERNET LASER SAFETY SCANNER



The Omron OS32C type 3 safety laser scanners provide compact and versatile presence detection to protect machine operators and factory staff. By integrating an Ethernet interface, the scanners allow easy configuration via a remote PC with few inputs required. Supervisors can monitor status from the desktop and analyse the

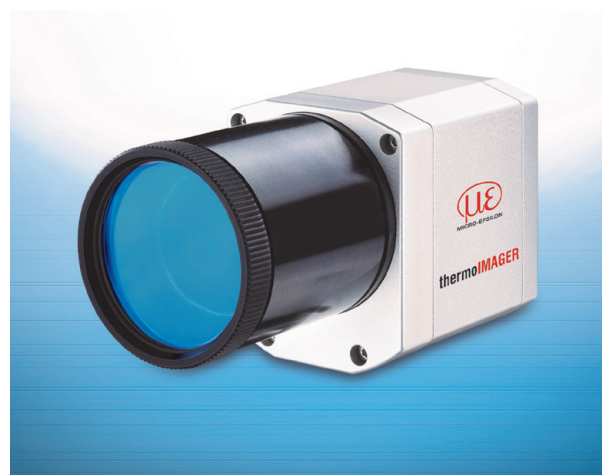
causes of any emergency stops, which helps improve safety practices and reporting. Multiple OS32Cs can be connected to the network and monitored in turn.

The sensor allows a safety zone of up to 4 m radius and two warning zones of up to 15 m, and can generate an alarm sounder, speed-control signal or emergency stop if zone conditions are breached. It is also capable of direction monitoring, and can detect intrusion from either side due to a 270° detection angle.

The OS32C comprises a detachable sensor block and an I/O block, which stores the configuration. This allows fast and easy replacement of any damaged sensors, with no reprogramming required. The I/O block is available with rear or side cable entry for extra flexibility. At 104.5 mm diameter, weighing 1.3 kg and drawing only 5 W active and 3.75 W standby power consumption, the sensors are easy both to handle and install.

RS Components Pty Ltd
www.rsaustralia.com

SHORT-WAVE INFRARED CAMERA



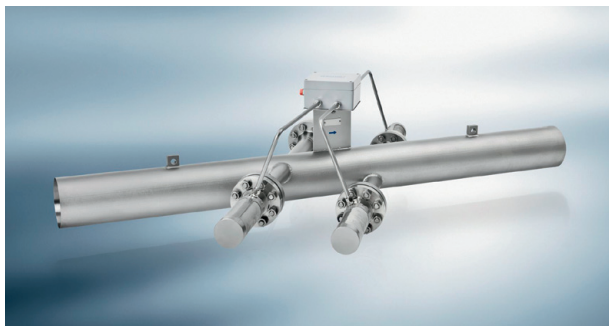
The Micro-Epsilon thermoIMAGER TIM M1, with a spectral range of 0.92–1.1 μm , is designed for thermographic images of hot metal surfaces. Due to a CMOS detector, the thermal imaging camera enables high resolution of 764 x 480 pixels and fast measurements.

The camera can obtain continuous temperature measurements in the range of 450°C to 1800°C, with image frequency up to 1 kHz and different resolution/image frequency modes. The entire temperature measuring range can be used without any sub-ranges, making it more flexible in many applications as the user does not need to switch over between different measuring ranges.

The camera has an ingress protection rating of IP67. Its main field of application includes temperature monitoring in hardening and forming processes of metals.

Bestech Australia Pty Ltd
www.bestech.com.au

ULTRASONIC FLOWMETER FOR SUPERHEATED STEAM



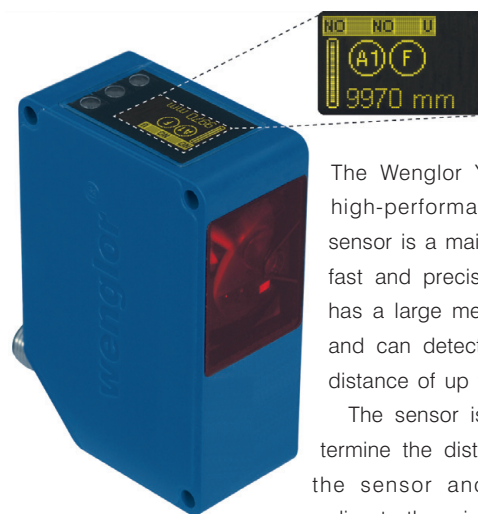
Krohne's OPTISONIC 8300 is a dedicated ultrasonic flowmeter for the measurement of superheated steam. The 2-beam flowmeter has a measuring accuracy of 1%, high repeatability and a large dynamic measuring range. Typical applications include boiler and plant efficiency monitoring in power plants, energy balancing or intercompany steam billing.

The flowmeter features a full-bore flow sensor without moving parts or obstructions, and a robust construction with no cables or sensitive parts exposed. It can uphold its measuring accuracy without maintenance or subsequent calibration for up to 20 years.

With nominal sizes ranging from DN 100 to 1000, the flowmeter is particularly suited to high flow rates. Pressure rating up to 200 bar and temperature rating up to 540°C are available. With temperature and pressure sensors connected to the device, the integrated flow computer can calculate steam mass flow.

Krohne Australia
www.krohne.com

DISTANCE SENSOR



The Wenglor Y1TA100QXT3 high-performance distance sensor is a maintenance-free, fast and precise sensor that has a large measuring range and can detect objects at a distance of up to 10 m.

The sensor is used to determine the distance between the sensor and the object according to the principle of transit time management. The object can be measured efficiently by the sensor, with the object's colour, shape and surface having almost no influence. Even dark objects can be easily recognised against bright backgrounds, making the sensor suitable for demanding applications.

The sensor has a graphical display for easy operation, with scratch-resistant optics, and the emitted light can be switched off. It has two mutually independent switching outputs, with the switching output A1 as analog output configurable as 0–10 V or 4–20 mA. The sensor offers high-precision monitoring and can be operated with very high speeds and resolutions. The operating temperature ranges from -25°C to 60°C with temperature drift compensation.

Treotham Automation Pty Ltd
www.treotham.com.au

RIGHT CHOICE. RIGHT PRICE. RIGHT NOW.

| Level Transmitters

| Flow Switches/Transmitters

| Pressure Transmitters

DWYER INSTRUMENTS, PTY. LTD. | Phone: (+61) (0) 2 4272 2055 | Fax: (+61) (0) 2 4272 4055 | Email: info@dwyer-inst.com.au
Website: www.dwyer-inst.com.au | Address: Unit 1, 11 Waverley Drive, P.O. Box 359, Unanderra, NSW 2526 Australia

FLOW, LEVEL AND TEMPERATURE SWITCH

The redesigned FLT93 Series FlexSwitch from FCI now meets all EU restrictions on lead solder and five other toxic materials found in some electronic devices.

The updated design of the FLT FlexSwitch features a quick-disconnect terminal block. The entire electronics assembly is firmly secured into an aluminium or stainless steel housing, which improves vibration immunity in rugged plant environments. SIL2 rated, the FLT93 switches are designed for demanding processes and plants. Ex agency approvals are provided for the entire instrument — FM, FMc, ATEX, IECEx, InMetro and EAC/TR CU.

The dual-function FLT93 switches can be configured for flow or level sensing, flow plus temperature sensing or level plus temperature sensing. A single FLT measures and monitors flow or level and temperature simultaneously with high accuracy and reliability. Dual trip points and 6 A relay outputs are assignable to flow, level or temperature.

Flow accuracy is $\pm 2\%$ of the setpoint velocity over $\pm 28^\circ\text{C}$ temperature range, with a repeatability of $\pm 0.5\%$ of reading. Level resolution is ± 2.5 mm with repeatability of ± 1.3 mm. Standard temperature accuracy is $\pm 1^\circ\text{C}$ with repeatability of $\pm 0.6^\circ\text{C}$.

Two sensing element configurations are available: the FLT93S switch is designed for standard heavy industrial applications and in applications with high velocity liquid setpoint requirements, while the FLT93F is designed for fast response gas applications. Both sensing elements can be supplied in either standard -40 to 177°C or medium -73 to 260°C temperature configurations. The FLT93S is also available in a high temperature -73 to 454°C configuration.

AMS Instrumentation & Calibration Pty Ltd

www.ams-ic.com.au



view – measure – evaluate

application.....
with Innovation

Metromatics is one of the leading suppliers of data acquisition systems, process monitoring and control systems instrumentation and has an extensive Sensor range and manufactures IP66 rated industrial and outdoor LCD Displays to suit a broad range of markets.

Call us today.

Load Cells
Torque Sensors & Multi Axis Sensors
Force & Pressure Sensors
Accelerometers
IP66 Industrial Displays
IP66 Sunlight Readable Displays
Ethernet, Modbus & Profibus I/O
Signal Conditioners & Converters
4-20mA Isolators & Splitters
Portable & Rack mount Data Acquisition Systems



Metromatics

Brisbane: (07) 3868 4255 Sydney: (02) 9460 4355
 Melbourne: (03) 9872 4592 Adelaide: (08) 8343 8516 New Zealand: +64 9 620-6573
 email: sales@metromatics.com.au internet: www.metromatics.com.au

Brisbane

Sydney

Adelaide

Melbourne

Perth

New Zealand

PRESSURE TRANSMITTER

The Series IWP pressure transmitter offers high performance, stability and long service life. The transmitter delivers a 4-2 mA signal in response to the pressure being measured against its stainless steel diaphragm for process system monitoring and feedback control.

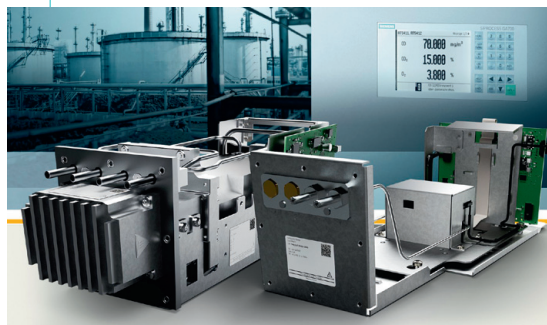
Made of cast aluminium and IP65 rated with an industrial conduit entry enclosure, the high-quality sensor circuitry is able to maintain precise operation under dirty and wet conditions, making the Series IWP a suitable choice for petroleum, chemical and metallurgical industry applications.

The Series IWP pressure transmitter features a 4-digit LED display as well as long-term stability and reliability in environmentally challenging conditions. It is designed for industrial processes such as petroleum, chemical and metallurgy but at a value price-point.

Dwyer Instruments (Aust) Pty Ltd
www.dwyer-inst.com.au



GAS ANALYSIS MODULES



Siemens has released two analyser modules for its Siprocess GA700 gas analysis system.

The Ultramat 7 and Calomat 7 modules (together with the Oxymat 7 module) allow users to configure flexible analytical solutions for measuring oxygen, hydrogen, noble gases or infrared-active components such as carbon monoxide and carbon dioxide.

The modular design of the Siprocess GA700 enables fast module installation and replacement. Depending on configuration, the units can be used at temperatures up to 50°C, making them suitable for process control and optimisation in incineration plants and for quality control and process monitoring in chemical and petrochemical plants.

The system comprises a base unit (including operator interfaces and customer interfaces) into which one or two modules can be integrated. The modules provide the sensor-based electronics including evaluation software, as well as the process connections. The influence of interfering gases can then be measured and mutually offset.

In addition to the already available Oxymat 7 module for oxygen measurements, users can now employ the Calomat 7 to carry out quantitative determinations of hydrogen and noble gases in binary or quasi-binary gas mixtures. Depending on the parameter settings, the measuring ranges for H₂ are 0-0.5%, 0-100% or 95-100%. The module can therefore be used both for pure gas monitoring and protective gas monitoring or for determining H₂ in blast furnace or converter gases.

The Ultramat 7 module carries out selective measurements of up to two infrared-active components such as carbon monoxide and carbon dioxide.

Siemens Ltd
www.siemens.com.au



Perfection in Automation
www.br-automation.com

NEW Automation PC SPECIAL OFFER



**ONLY
\$1,750***
(+GST)

Specifications:

- Intel ATOM E3845 Processor Quad Core 1.9GHz, 4GB SDRAM
- 128GB CFast memory card
- Pre-installed Windows 7 Professional, 64 bit

Features & Benefits:

- Dual Gigabit Ethernet ports, USB2.0 and USB3.0
- Powerful graphics engine. Up to 24" Full HD
- Fully tested and pre-installed operating system
- APC2100 is fanless and can operate in temp up to 50 °C



* ABN Holders only
OFFER ENDS 30/9/2015 Limited to the first 50 units sold.

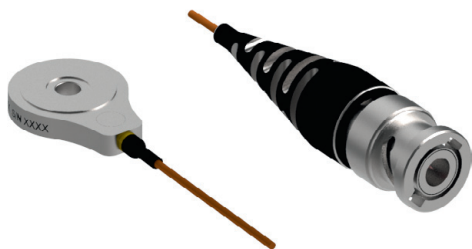
Order Code: **APC2100-QC-128GB-W64-NOAP**

Distributed by

DAANET
CONTROL INFORMATION CONNECTIVITY

1300 DAANET
www.daanet.com.au/perfection

FORCE SENSOR



The Dytran 1212V3 is a low-profile, ring-style IEPE force sensor that is offered with a 0.22 mV/N sensitivity and 3 m integral cable with a BNC plug termination. The industry commonly refers to these sensors as “force washers”, due to their similar appearance. Units are designed to measure rapid or slowly changing dynamic forces in machinery and other applications where a stud or bolt holds the sensor in place in a preloaded condition.

The 1212V3 can measure vibratory compressive forces over a wide frequency range and unidirectional pulsing forces from punch and forming presses, and other repetitive force applications including impact forces.

As an IEPE sensor, the 1212V3 features built-in electronics, eliminating the need for an external charge amplifier and converter.

The 1212V3 is offered with a full scale range of 2268 kg. Design of the 1212V3 features a quartz sensing element, operating in compression mode and packaged in a rugged stainless steel housing weighing 8 g.

Metromatics Pty Ltd

www.metromatics.com.au

LASER DISTANCE SENSOR

Banner Engineering has improved its Q4X laser distance sensor with a dual teach mode model. Featuring updated firmware, the Q4X dual teach mode sensor combines window thresholds on both target distance and target reflected intensity, allowing the Q4X to solve difficult applications. The Q4X can now detect clear objects without requiring a retroreflector. Dual mode can be used to error-proof applications by ensuring the correct colour part is located at the correct position.

The Q4X detects distance changes as small as 1 mm and covers a 25-300 mm range. The sensor is suitable for difficult distance-based sensing applications as it easily detects objects regardless of target surface reflectivity, including black foam on black plastic, black rubber in front of metal, multicolour packaging and targets of all colours. Now with the dual teach mode, the sensor can detect small changes in reflected intensity for targets inside the distance threshold.

Offering a simplified user experience, the Q4X includes a bright readout on a highly visible, angled four-digit display that is easily viewed from multiple vantage points. The Q4X also offers intuitive user set-up utilising three tactile push-buttons located below the display.

The Q4X is constructed with robust housing rated to IP67, IP68 or IP69K, allowing use in wet and high-pressure washdown environments, durable FDA-grade stainless steel resists mechanical impact, overtightening, extreme vibration and aggressive cleaning procedures.



Turck Australia Pty Ltd

www.turck.com.au

EX - STOCK • LOW COST • IECEx UNIK 5072 Pressure Transmitter

Thermo Fisher Scientific are pleased to announce ex-stock* availability of this low cost general purpose stainless steel pressure transmitter.

Output: 4-20mA

Accuracy: $\pm 0.2\%$ FS (BSL)

Ranges*: Gauge & Absolute from -1 to 700 bar
Barometric 800-1200 mbar

Certification: IECEx ia Group IIC

*Selected popular ranges. Stock availability subject to prior sale.

Other products:



Pressure

Flow

Level

Position

Force/Torque

For more Information, please contact **1300 735 295**

InfoindustrialAU@thermofisher.com or visit **www.thermofisher.com.au/IP**



ThermoFisher
SCIENTIFIC

Refinery turns to thermal mass flow meter for nitrogen tank blanketing

An independent refiner in the US Midwest recently approved a project to improve the safety of its plant and reduce its costs for nitrogen gas used for tank blanketing. The company operates refineries in multiple states, with a combined crude oil processing capacity of more than 500,000 barrels per day.

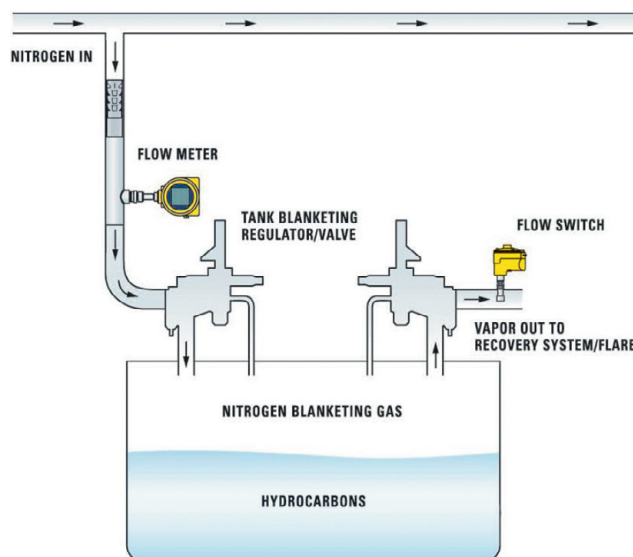
Nitrogen blanketing is a practice commonly used in the chemical and petroleum refining industries to reduce the hazards associated with flammable liquids. It is the process of applying nitrogen gas to the vapour space of a tank or vessel, which minimises the possibility of an explosion or fire by reducing the oxygen content or the concentration of flammable or explosive vapours in a tank or vessel.

Blanketing also helps decrease product evaporation and protects the tank from structural corrosion damage caused by air and moisture. Nitrogen usage varies based on the size of the tanks and vessels used in the production, transfer, transportation and packaging of the product. There are three common methods of blanketing: continuous purge, pressure control and concentration control. The continuous purge method employs a constant flow of nitrogen. This approach is simple, but nitrogen consumption is high. The pressure control and concentration control methods are more costly to implement and rely on the pressure in the tank or the concentration of the oxygen to initiate the flow of nitrogen, but these methods improve overall safety and the efficiency of the process.

The refiner's plant team needed to measure the flow rate of nitrogen more accurately in its tank blanketing applications. This would maximise safety while improving efficiency; lower the plant's nitrogen consumption and costs; and eliminate any unexpected supply shortages.

The amount of nitrogen pumped into or released out of the tank's vapour space is controlled by a predetermined pressure set point. As product is pumped from the tank, the vapours inside expand and the pressure falls below the set point, more nitrogen is then introduced. As the vessel is filled, the vapours begin to compress and the nitrogen is released and usually sent to a vapour recovery system.

Product falling and rising can create static electricity, so the amount of nitrogen in this vapour space is an extremely important safety factor. The refiner needed a flow meter that could provide a mass flow output and measure a low flow rate of 36 to 600 SCFH (1 to 17 NCMH) at 70°C with a pressure maintained at 60 psig (5 bar) in a 1" schedule 80 pipe with limited straight run. With these process requirements, the plant team had many challenges to overcome.



After consulting with the applications team at Fluid Components International (FCI), the refinery's process engineers selected the Model ST100L thermal dispersion air/gas in-line mass flow meter and the Vortab flow conditioner.

The Vortab flow conditioner provided a low pressure-loss solution for flow profile irregularities produced by elbows, valves and other disturbances that are commonly present when sufficient straight run is not available to generate the necessary flow profile. The ST100L meter was factory calibrated in FCI's NIST certified laboratory for nitrogen service.

Once installed, the flow meter provided an accurate, repeatable and reliable output necessary for the tank blanketing valve to operate as designed and provide the safety and cost savings expected in this application.

Multiple ST100L flow meters have now been installed at the Midwest refinery for its nitrogen tank blanketing application. The refiner has reduced its nitrogen consumption considerably, which in turn reduced its overall operating costs. According to the plant engineering team, the flow meters are working better than expected. The ST100L was a perfect fit with application conditions because of the installation challenges and process requirements.

A slightly longer and more detailed version of this article can be read online at: <http://bit.ly/1K1clb9>

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



Dart Instruments

...sense the RELIABILITY

Dart Instruments Pty Limited A.C.N. 109 479 763

Phone: 61 2 8456 7550 Fax: 61 2 8456 9988

Email: sales@dartinstruments.com.au www.dartinstruments.com.au



POWER SUPPLIES

The latest generation of the TRIO POWER supply range has been designed for use in machine building. All functions and the space-saving design are optimally coordinated to the stringent requirements. Under challenging ambient conditions, the power supply units, which feature a robust electrical and mechanical design, ensure the reliable supply of all loads.

THE TRIO power supplies feature high shock, vibration and electric strength, and offer dynamic boost to supply 1.5 times the nominal current for 5 s. Output voltage is 24-28 VDC configurable, and DC OK is indicated by an LED and a relay contact.

Space is saved in the control cabinet due to the narrow design, and installation is simplified through the use of push-in connections.

Phoenix Contact Pty Ltd

www.phoenixcontact.com.au



PANEL PC

The PPC-F12B-BT metal bezel panel PC from IEI Integration is powered by the Intel Celeron J1900 quad-core SoC and can support up to 8 GB of DDR3 SO-DIMM memory.

It features a 12" LCD screen and an ultraslim aluminium front bezel providing two types of touch options: resistive and projected capacitive. The full-function LCD panel PC features two RJ-45 LAN ports, two USB 3.0 ports, two USB 2.0 ports and HDMI and VGA video ports, as well as two RS-232 and one RS-422/485 port.

The product has an IP65 rating, providing resistance to the ingress of dust and liquids. It supports IEI's Remote Intelligent Solution, the iRIS-2400, facilitating remote management and power control. It also features dual full-size PCIe mini card expansion and can operate from a 9-36 VDC supply.

ICP Electronics Australia Pty Ltd

www.icp-australia.com.au

Flexible Modular Specialist Design



I/O Modules for:

- Data Acquisition
- Digital and Analog I/O
- Temperature Measurement
- Thermocouple and RTD's
- PLC I/O Expansion
- Point to Point Multiplexing
- Ethernet/Serial Converters
- Programmable Logic Controllers

**PCE PROCON
ELECTRONICS**

phone: +61 2 9624 8376

fax: +61 2 9620 8709

email: glen@proconel.com

www.proconel.com

IECEX SAFETY RELAY

The Schmersal SRB-EXi safety relay modules now meet the requirements for use in hazardous areas since obtaining IECEx certification.

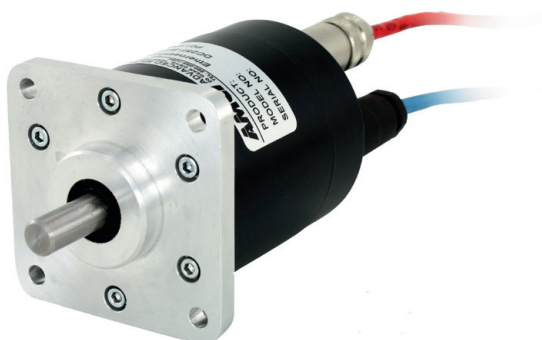
The SRB safety relay is suitable for secure signal analysis of emergency stops and safety monitoring equipment up to safety category 4 or PLe. This device is capable of monitoring safety devices such as E-stops, pull wire switches, guard switches and non-contact safety sensors installed in hazardous environments.

Short circuit, wire break and earth connection detection are all supported across the two safety monitored inputs while the dual safety outputs use forced guided relays to ensure peace of mind in times of need. An automatic restart model is available or manual edge detection restart is also available with an intrinsically safe restart circuit.

The requirements for explosion protection apply in many areas of the industry including chemicals, gases, materials handling and even food processing where powdered ingredients or end products are processed, manufactured or stored.

Control Logic Pty Ltd

www.control-logic.com.au



DEVICENET ENCODERS

Automated Control and Advanced Micro Controls Inc (AMCI) has announced that DeviceNet communication has been added to its range of NR25 series encoders, complementing the current range of ethernet (with PoE) and Profibus output options.

The NR25 networked encoders are available in both single-turn (16 bits = 65,536 counts) and multiturn (30-bit, 65,536 counts x 16,384 revolutions) versions.

The encoders are offered in a variety of package options that include flange mount, servo mount, solid shaft and hub shaft. Two integrated M12 connectors supply power and DeviceNet connectivity. Stainless steel housing options are also available.

As the NR25 encoder is resolver based, high levels of shock and vibration can be withstood while providing absolute position feedback. This is a result of resolvers not requiring the use of glass-sensing discs or sensitive electronic components such as LEDs.

Automated Control Pty Ltd

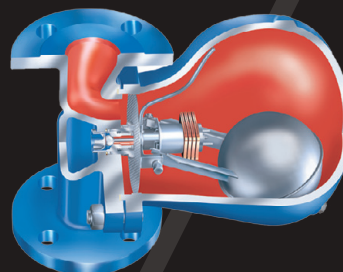
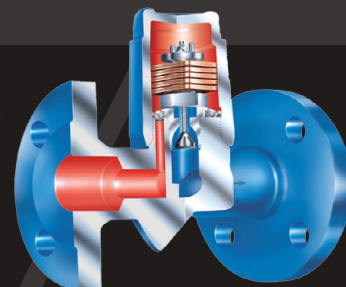
www.automatedcontrol.com.au

HIGH PERFORMANCE STEAM TRAPS



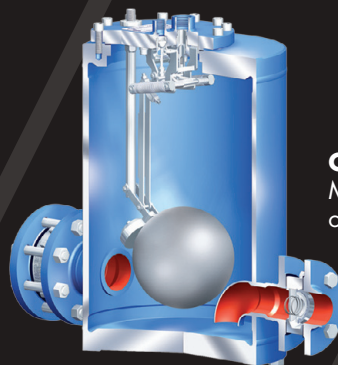
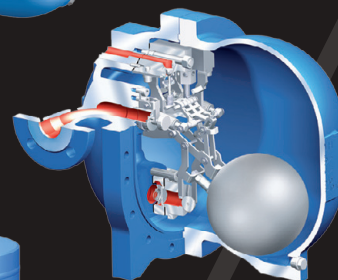
CONA STEAM TRAPS

B – Bimetallic
M – Thermostatic
TD – Thermodynamic



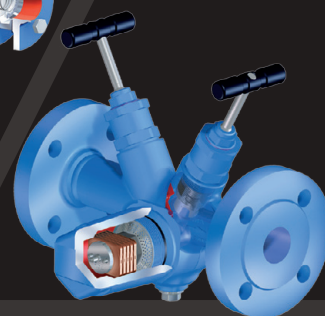
CONA S
Ball float steam trap

CONA P
Pump trap



CONALIFT
Mechanical
condensate pump

CONA
"All-in-One"
Multi-valve system



AUSTRALIAN AGENT & STOCKIST



PRESSURE & SAFETY SYSTEMS

Tel: (03) 9699 7355

www.pressureandsafety.com.au

BIG DATA IN MANUFACTURING

A COMPASS FOR GROWTH

Jo-Anne Ruhl, General Manager, Pacific, Infor

Embracing the power of big data can help manufacturers be more competitive and improve efficiencies.

Data has long been the essential lifeblood of manufacturing, driving efficiency improvements, reductions in waste and incremental profit gains. But today a new breed of big data analytics is taking over manufacturing and providing a totally new dimension to the value of research and trend analysis. Now, data is no longer being used for reporting past activities; it's helping manufacturers predict future events, foresee risk, understand their extended value chain and enhance the customer experience they deliver. Data has grown up, with new multidimensional capabilities and broader horizons. It's like a compass, pointing the way for manufacturing growth.

What's driving big data?

Big data is quickly becoming an important element of the fourth generation of ERP technology. Today, fourth-generation ERPs are transforming outdated manufacturing facilities into highly automated, efficient powerhouses. Big data's ability to engage data, people and processes is helping to create a new era for manufacturing. Whether you call this new era the 'factory of the future' or the 'connected enterprise', there are two elements driving the transformation: innovative mindsets and data.

Manufacturers now have access to more resources for data capture and tracking than ever before. Data is coming from traditional sources, like the classic customer survey, as well as more innovative applications, like smart sensors and the use of the Internet of Things (IoT) to capture machine readings. Managers throughout an organisation can access real-time data for every aspect of the products being manufactured, from warranty claims to cycle times and inventory counts. In fact, the volume of data available is so vast that it can quickly become overwhelming and cause data paralysis.

In spite of this, manufacturers are beginning to realise the value of big data. According to a recent report by Pierfrancesco Manenti, *The Digital Factory: Game-Changing Technologies That Will Transform Manufacturing Industry*, 47% of manufacturers expect big data analytics to have a major impact on company performance — making it core to the future of digital factories — while 49% expect advanced analytics to reduce operational costs and utilise assets efficiently.

Additionally, manufacturers are putting their investment dollars on the line for big data, too. According to the TechTarget 2015 IT Priorities Survey, 31% of the 2212 respondents worldwide said their



© ianwel/Dollar Photo Club

organisations plan deployments of business intelligence, analytics or data warehousing tools in 2015. A quarter of respondents expect to invest in big data analytics and 21% expect to invest in big data processing and management.

Where is all the data coming from?

Manufacturers today have more resources for data capture and tracking than ever before. The overabundance of data can be intimidating and cause manufacturers to struggle to understand how to use the data available and how to harness its power.

Data can come from both internal and external sources or be generated by machine-to-machine interaction. Together, these sources can provide manufacturers with the information they need about their customers, products, processes, people and equipment.

- **External sources:** Manufacturers can turn to external sources, such as user groups, social media, focus groups or surveys to build customer data. Third-party surveys, portals and call centres add an impartial layer to the data collection that is often less threatening to the customer. The promise of anonymity can also generate higher response rates. This fact finding can be used to build accurate profiles of customers and prospects, includ-

ing subjective or 'soft' characteristics, like colour and design preferences, common buying triggers or evaluation criteria.

- **Internal sources:** Manufacturers can also turn to their own systems for data capture and analysis. A modern, integrated ERP system can provide data on products, processes and people at all levels and departments in the organisation. Data collected through an ERP system offers benefits, such as real-time reporting with up-to-the-minute accuracy, a common database that provides one version of the truth, the ability to drill down into details for historical depth and relational data with context and relevance.
- **Machine-to-machine:** Smart sensors and the IoT can now collect data directly from machines and equipment and send it on to an ERP system, EAM system or other enterprise application. Built-in, low-cost sensors can detect a wide range of attributes, including location, weight, temperature, vibration, flow rate, humidity and balance. These conditions can then be monitored in order to identify and predict performance issues that require service, repair or replacement. This allows manufacturers to get an early warning of impending issues, and hopefully intervene before there's a catastrophic interruption to processes and performance.

Machine data provides valuable insights about how equipment functions in use, whether it is the machinery on the factory floor or the product in the consumer's home. Detailed product lifecycle analysis can point engineers to future design improvements and performance enhancements. This data also gives manufacturers the ability to predict opportunities to sell replacements and upgrades. Predicting future needs can also help with sales forecasting and inventory management, so the organisation can prepare for changing demands.

What can manufacturers do with all that data?

As mentioned, in this new paradigm of manufacturing data the focus is no longer primarily on reporting on past events; data today is also being used to predict trends and anticipate needs. Big data acts as the gateway to the future.

Manufacturers certainly understand the value of predictive abilities. Anticipating consumer trends, stocking necessary inventory and maintaining adequate resources to meet customer orders have been high priorities for manufacturers for decades. As speed of delivery and just-in-time inventory strategies gained importance, the ability to accurately forecast needs also grew. Manufacturers learned — sometimes the hard way — the importance of choosing the right influencing factors or the right combination of factors. When attempting to predict the future, one data source is seldom sufficient.



MANUFACTURERS TODAY HAVE MORE RESOURCES FOR DATA CAPTURE AND TRACKING THAN EVER BEFORE. THE OVERABUNDANCE OF DATA CAN BE INTIMIDATING AND CAUSE MANUFACTURERS TO STRUGGLE TO UNDERSTAND HOW TO USE THE DATA AVAILABLE AND HOW TO HARNESS ITS POWER.

Today, predictive analytics has become a valuable science and tool for manufacturers. It turns data collected from numerous sources into a blueprint for future actions. Modern business intelligence solutions now have the ability to project trends with a high degree of accuracy. As in any data initiative though, the output is only as good as the input. Manufacturers must take care to choose reliable data sources and to continue to refine which influencing factors provide the best signposts for future activities.

Predictive capabilities offer many benefits to manufacturers, including:

- **Staffing readiness:** When manufacturers have a reliable forecast of product sales, departments throughout the organisation can plan personnel staffing accordingly, hiring personnel as needed and allowing adequate time for team training.
- **Raw resources in stock:** Procurement teams can use accurate predictive forecasts to better plan just-in-time inventory levels of raw materials, preventing delays due to stock outs.
- **Spare parts inventory:** An accurate understanding of the product lifecycle translates to being better prepared for necessary maintenance, including having the consumables and parts that require regular replacement in stock.

Anticipating consumer trends also provides a much-needed competitive head start, allowing the timely manufacturer to be first to market with a product innovation or first to introduce a breakthrough concept to an emerging niche market. Companies that are early arrivers often maintain valuable ownership of the market.

Successful product innovation largely relies on an accurate reading of the market's preferences and needs. Design engineers need to understand the consumer's pains in order to determine the potential value of new products and help prioritise allocation of R&D dollars. Big data makes this possible.

How can big data fuel growth?

How can big data provide significant return on investment (ROI) and lead to manufacturing growth? This is the question manufacturers must answer if they want to take full advantage of big data's potential.

Big data acts as a compass — it provides a guide, but it's not magically going to start generating greater sales and more customers. Collecting data — whether from machines through the IoT or from customers through online portals — is not the end. That data must be translated into action. This is the step that requires careful attention to detail and a thorough understanding of the relevance of the data. This is where many manufacturers fall short in their big data initiatives.

However, with careful analysis, data can be used to identify, analyse and foster growth opportunities by helping manufacturers:

- **Identify new geographic regions to target:** Manufacturers can match demographics of current customers with profiles of pros-

pects in other regions or countries. Global expansion becomes easier when manufacturers know what prospect characteristics to target.

- **Expand into niche/micro-markets:** Manufacturers can use data to spot pools of untapped opportunity. They can identify micro-markets that are currently under-served or that need specialised make-to-order (MTO) products. By being the first to reach a new market, manufacturers can become trusted advisors and build a market.
- **Tap into a customer base:** Data can help manufacturers identify opportunities to upsell, cross-sell and resell to their current customers. They can predict their customers' needs and the performance gaps in their current products. Data from successful customers can help manufacturers reinforce their message and demonstrate the value of upsell and cross-sell products.
- **Foster customer intimacy:** When manufacturers understand their customer pains, they can provide better out-of-the-box solutions. Data is the common language between manufacturers and customers; it helps manufacturers better understand and serve their customers, and forge strong bonds with them.
- **Innovate:** Manufacturers can use data to accurately predict the impact of design and engineering refinements, and speed product innovations and launches of breakthrough solutions. With the right data and analysis tools, they can accurately forecast the sales impact of a new product — as well as its risks.
- **Improve product lifecycles:** Data can help manufacturers identify design flaws and weak elements of mechanical design. They can use this data to refine product features. Plus, this data can help identify suppliers and subcontractors who are meeting expectations, and eliminate subcontractors who are performing poorly.
- **Increase value-add:** Data can help manufacturers extend their offerings to enhance the customer experience and the value-add. Services like consulting, installation, aftermarket service, extended warranties and ongoing maintenance contracts offer possible new sources of revenue. Data can help manufacturers manage these service-related offerings with greater efficiency.
- **Improve profit margins:** Manufacturers can use data to optimise their lean initiatives to reduce waste, improve productivity and stretch already thin margins.

It's time for big data

It's becoming clear that manufacturers need to embrace big data in order to remain competitive. Manufacturers that make the most of the customer, product and equipment data they capture stand to improve their ability to innovate, please their customers and bring more profitable products and services to market more quickly.

Infor Global Solutions (ANZ) Pty Ltd
www.infor.com.au





PANEL PCS

The Nanobox PC Simatic IPC227E and Nanopanel PC Simatic IPC277E are compact and energy-efficient industrial PCs designed to offer significantly improved performance compared with the previous generation.

All versions are equipped with RS232/RS422/RS485 serial ports, USB, Ethernet and DisplayPort interfaces, so they can be quickly and easily integrated into automation solutions.

The fanless Nanobox PC Simatic IPC227E and Nanopanel PC IPC277E with an integrated 24 V industrial power supply can be optionally operated without a battery, and are designed for maintenance-free, 24 h uninterrupted duty, even under severe temperature, vibration and shock conditions, and strict EMC requirements.

Mass storage systems include a solid-state drive (SSD) of 80 Gb or more, and CFast drives up to 16 GB, as well as an optional 512 Kb nonvolatile.

The devices have pre-installed diagnostic software for device diagnostics and the Nanobox PCs also have four status LEDs. The Nanopanel PC Simatic IPC277E is equipped with a 7-, 9-, 12-, 15- or 19-inch, high-resolution, wide-format industrial touch display with a wide viewing angle. The background lighting is up to 100% dimmable, which not only reduces the power consumption considerably but also lengthens service life.

These industrial PCs can be configured online, and they come supplied with a pre-installed, activated Windows Embedded Standard 7-E or 7-P operating system, Windows 7 Ultimate Multilanguage, and suited-for-Linux or VxWork-tested certification.

Siemens Ltd

www.siemens.com.au



INNOVATION

**“Installation in record time
– for optimal performance
in your plant.”**



New from VEGA: the optimised VEGAFLEX Series 80 TDR sensors.

The all-new product series VEGAFLEX 80 offers a variety of useful functions. Its simple adjustment concept guarantees even greater reliability for level and interface measurement. The instruments are optimised for all applications in liquids and solids. New versions for food and pharmaceutical production and for high-pressure and high-temperature applications round out the series.

www.vega.com/au/innovation.htm

Phone: 1800 817 135

Looking Forward

VEGA

ICON

New
online
photometer
for drinking,
surface and
waste water



Easy online
determination of

- silica
- iron(II)
- iron(III)
- phosphate
- ammonia
- and more...

The new ICONs

are very easy to use, highly
affordable single stream
online analysers from
Metrohm Process Analytics.



Leading Analytical Instrumentation

MEP Instruments Pty Ltd
Australia Tel 1300 720 485
New Zealand Tel 09 477 0620
www.mep.net.au

A company of Metrohm and Anton Paar

NEW
PRODUCTS



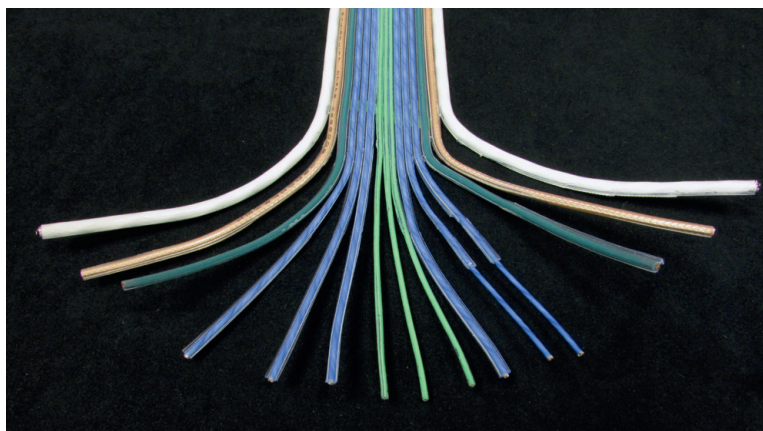
METAL-SEATED VALVES

Fisher Z500 metal-seated valves are engineered to withstand higher temperatures, pressures and more erosive conditions than a standard on/off ball valve, providing increased reliability and protection of critical assets in demanding applications. A bidirectional sealing design offers a solution to process back pressure and shutoff requirements in both flow directions, safeguarding control valves and other equipment in the line.

Fisher Z500 valves are designed with an integral metal seat and self-energised metal body gasket to help eliminate leak paths and withstand extreme temperature changes. Live-loaded packing, side-mounted brackets and fixed centrelines help reduce side loads on the packing and decrease overall wear for a longer service life. This addition of on/off valves to the Fisher range complements the existing control valve offering and helps ensure seamless integration between products.

Emerson Process Management

www.emersonprocess.com.au



FLAT PROFILE CAT 6A CABLE

Cicoil's Cat 6a cable has a flat, compact design that claims to provide reliability when flexed, twisted or routed through tight spaces, while Cicoil's proprietary Flexx-Sil rubber encased cable is designed to provide high-speed data transmission rates of 10 Gbps, frequencies of 500 MHz and above average suppression of electromagnetic interference, especially in continuous flexing applications.

Cicoil's extrusion process allows four individually shielded 28 AWG 100 Ω pairs to be placed in a small, flat profile — precisely controlling the spacing of each component, insulation thickness and the overall cable shape.

The flat design concept allows for easy stripping and a significant decrease in cable prep time, with the design being compatible with standard handheld manual and automated stripping and crimping equipment.

In repeated flexing applications, the space-saving Cat 6A cable features a repeated bend radius of just 2 cm and a cycle life exceeding 10,000,000 repetitive flexing cycles.

Individual Cat 6 cables can be stacked in a cable track, and through the use of Cicoil's On-line Cable Configurator, multiple Cat 6 cables, as well as other components, can be incorporated into a custom-made single flat cable design.

Treotham Automation Pty Ltd

www.treotham.com.au



FAST ETHERNET REDUNDANCY SWITCHES

Belden has released the RED25 family of entry-level, Fast Ethernet redundancy switches designed for industrial automation applications in need of cost-effective and high-end redundant network solutions.

RED25's focus on redundancy makes these switches suitable for the automotive, manufacturing and machine building industries. These industries tend to have automation systems that are part of the network infrastructure. When a system failure occurs, it happens most often within the network and causes service interruptions. RED25's redundancy technology can reduce the effects of these failures, minimising the risk of outages while maximising productivity, ensuring consistent communication and keeping plants operating.

In addition to supporting various redundancy technologies, the RED25 switches have comprehensive built-in security features to provide reliable protection against network

attacks or operating errors. They are also customisable based on specific port needs or environmental factors, such as temperature range.

RED25 provides maximum productivity and network uptime, thanks to interruption-free data communications based on parallel redundancy protocol (PRP) and high availability seamless redundancy (HSR). Other redundancy technologies, like rapid spanning tree protocol (RSTP), device level ring (DLR) and media redundancy protocol (MRP), allow the switches to connect to existing networks. The switches have also been designed to handle high ambient temperatures and meet precise time synchronisation requirements.

The RED25 switch is offered in two, four-port versions: four fast Ethernet (FE) TX ports, or two FE TX ports, plus two FE small form-factor pluggable (SFP) ports.

Belden Australia Pty Ltd

www.belden.com

Modular KS4400 Series DIN Enclosures

more
space
for
your
ideas!

- Distinctive look
- High functionality
- Maximum Flexibility
- 2 to 96 terminals, code-able
- Flexible Terminal Options:
 - Standard Screw
 - Screw Pluggable
 - Screw-less Pluggable
- Generous front panel area
- Compact form factor
- DIN Rail BUS system



contact: sales@erntec.net or call (03) 9756 4000





BEARINGS

The latest FAG radial insert ball bearing and housing units from Schaeffler Australia feature easy mounting and smooth running. They feature a DUROTECT B coating to provide improved anticorrosion protection and are therefore suitable for challenging operating conditions where they require less maintenance.

The robust units are particularly suitable for medium- to high-load applications, including power transmission; conveying and materials handling; metals and steel; mining and energy; textiles and paper; packaging and woodworking machinery; pumps and processes exposed to wet conditions; food and beverages; water and wastewater; and oil and gas.

Misalignments are compensated for by the matched design of the housing, the radial insert bearing and the plus tolerance of the bore. Reworking of the shaft is no longer required. In addition, two self-retaining set screws that are offset by 120° securely locate the inner ring on the shaft.

Optimised internal geometry, honed raceways and high ball quality ensure quiet running. The low frictional torque of the radial insert ball bearings reduces the energy requirements of applications. Minimum friction also involves minimum heat generation and therefore maximum grease operating life.

The seal that is firmly staked in the outer ring retains the grease in the bearing and thus allows easier relubrication. It has a vulcanised seal lip that effectively prevents dust and water from entering the bearing. To protect the seal lip against damage, an outer flinger shield is fitted on the inner ring.

Schaeffler Australia Pty Ltd

www.schaeffler.com.au



Call for a **FREE** copy of our Latest Additions Catalogue

Inspection and Digital Image Management in the Palm of Your Hand

Rent the GE Everest Ca-Zoom 6.2 Remote Visual Inspection System from TechRentals

Features

- ✓ Includes PTZ-140 pan tilt camera module (36x optical, 12x digital zoom)
- ✓ Industrial water proof packaging to 45 m or 4.5 bar
- ✓ Supplied with 1.8 to 3.6 m telescopic mounting pole and 30 m cable
- ✓ Optional PTZ-70 (76 mm openings) camera module available



\$ Save with our NEW long term rental rates



For more information, contact us today:



1800 632 652



rent@techrentals.com.au



www.techrentals.com.au



Fully automated QA for electrical switch manufacturer

The market that switch and socket manufacturer Feller supplies is extremely dynamic and places highly stringent demands on both management and production. Since quality plays such a fundamental role for the Horgen-based maker of electrical goods, manufacturing is carried out wholly on-site in Switzerland.

At first glance, it may seem that Feller would benefit from the lower production costs achieved by manufacturing in a low-wage country, but the pitfalls would be considerable. The company could run the very real risk of producing unchecked, defective parts such measures which ultimately paralyse an entire installation for months on end. Feller's objective, therefore, is to establish real-time, zero-defect production locally and thereby achieve sustainable optimisation.

Peter Suter is group manager for automation at Feller and is responsible for ensuring trouble-free production. He confirms that zero-defect production is a fundamental criterion for market success today in the field of electrical installation.

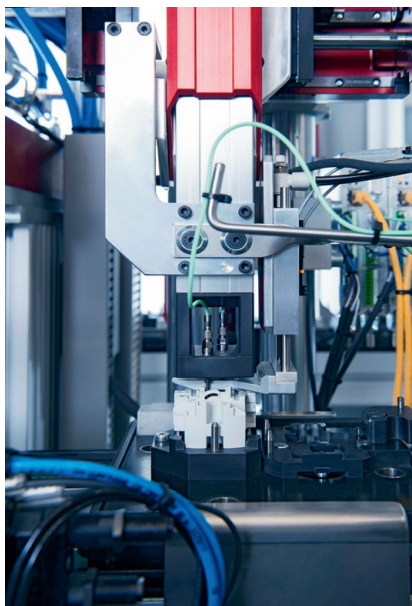
"The requirements for quality are continuously increasing. Over the years, tolerances for acceptable waste have become more and more stringent — something that is also reflected in the requirements for continuous process improvement and associated quality tests. As a result, it is not surprising that the aim of the fully automated process at Feller is the final testing of each individual product," he says.

In 2008, new standards for switches and sockets in the Swiss energy market presented new challenges for Feller. Based on these new stipulations, a completely novel production line was implemented in the plant.

"One requirement for the new production line was to guarantee quality standards using force/displacement monitoring. This was part of the design specification presented to the mechanical engineer. To monitor the caulking at the rocker switch, Insys from Münsingen proposed using Kistler technology. The new production line — equipped with Kistler sensors — was commissioned in 2008," said Suter.

In 2011, the continuous increase in quality requirements resulted in the need to check the switch functionality when it was installed (in addition to the caulking of the rocker switch).

"In this context, the switching point of the switch is tested again in a further step. The aim here is to ensure that any switches that are not 100% in order do not generate further costs. All switches that do



not meet the desired functionality, or require excessive effort to switch over, are removed from the process directly in the course of this test," explained Suter.

The solution for this second application was developed specially by Feller. As the company was satisfied with the force/displacement monitoring solution from Kistler, it was clear that the company's technology should be adopted to perform this testing. Feller therefore discussed solutions with the Kistler team and subsequently implemented a low-force sensor.

"Due to the low forces and confined space, our solution implemented Kistler's Type 9215 sensor. Thanks to the optimal installation and the minimised design, this solution delivers a high force resolution today. Installation of Kistler's low-force sensors provides a closed system that supplies reproducible, reliable

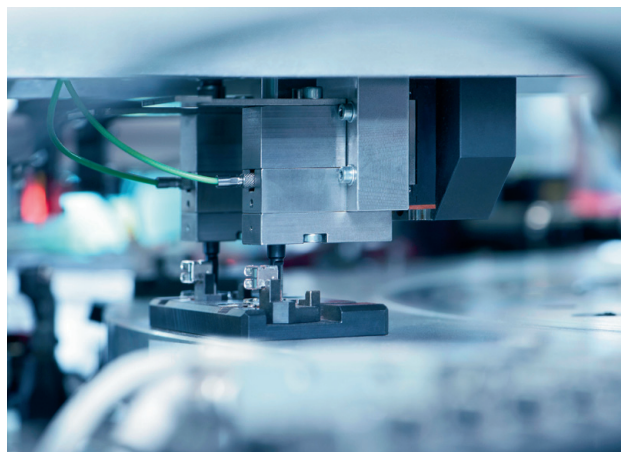
values and brings quality assurance to a completely new level," he said.

"For the initial delivery, Kistler was recommended to us by our machine suppliers — and thanks to the company's good reputation in the industry, we did not question this. In the case of the second requirement, which Feller retrofitted into our existing plant, the positive experience from that first application meant that Kistler was the only company we considered for the job."

For Feller, this has paid off 100%. "Our production is highly efficient and delivers verified, 100% defect-free parts today," said Suter.

Kistler Instruments Australia Pty Ltd

<http://www.kistler.com/au/en/>



Processonline.com.au

Your online community – at your convenience 24/7

Search products, articles, news & tech papers with **FREE** access



GAS AND MOISTURE ANALYSER

The Michell Instruments XGA301 bench-mounted analyser can be configured to use either zirconia oxide or electrochemical cells to measure oxygen, or infrared technology to measure other gases such as carbon dioxide, methane and carbon monoxide. Optional moisture measurements are also available with Michell's Easidew ceramic impedance sensors for moisture content (ppm) or dewpoint temperature. For further flexibility, any two of these measurement cells can be combined in one unit.

The cost-effective XGA301 industrial gas analyser is suitable for applications where both oxygen and moisture measurements are required. The different types of sensing cell available mean a wide variety of applications can be addressed by instrument including laboratory testing, leaks in glove boxes, testing the purity of inert gases and other research experiments. The unit is also suitable for use in industry for applications such as reflow oven monitoring, nitrogen generation and food production.

The analyser has many options including an internal sample pump and flame arrestor, and has a simple-to-use HMI with an intuitive menu structure.

AMS Instrumentation & Calibration Pty Ltd

www.ams-ic.com.au

Your Global Automation Partner



WARNING

Not suitable for repairing flimsy connectors
(or your reputation).

TURCK

Rugged, reliable industrial automation products from TURCK are built to perform in the toughest conditions, and our engineered solutions are customised to meet your application challenges. Cheap knock-offs can't compare. **TURCK works!**



Overmolded Deutsch Connectors Designed for longevity in demanding environments where shock, vibration, cold, moisture and oils can affect performance.

Call 1300 132 566 or visit www.turck.com.au

POWER REDUNDANCY MODULES

Redundancy modules are used for building N+1 and 1+1 redundant power supply systems, where it is critical that a control circuit remains powered even if a power supply was to fail.

Some of the key features of the PULS MOSFET redundancy modules are low power losses and voltage drop due to MOSFET technology, short circuit output protection, reverse polarity protected inputs, 160% overload capability for 5 s and a plug connector on the output of the YR40.245 model, which means that the module can be hot swapped without the need to turn off power to the load.

The range includes modules that have two 20 A inputs and one 40 A output, one 40 A input and output, as well as a model with two 40 A inputs and one 80 A output. Voltages range from 12 to 56 VDC depending on the model.

Control Logic Pty Ltd

www.control-logic.com.au



SAFETY ENCODER

Hengstler has introduced the ACURO Drive AD37S multturn encoder with Safety4Wire. The Hengstler Safety4Wire interface was especially designed to provide high levels of functional safety in servo motor control systems.

The interface protocol meets SIL3 requirements according to IEC 61508, Cat. 3 PLd per EN ISO 13849, while the AD37S encoder itself and the IP core in the controller both meet SIL2.

The AD37S has an operating temperature range from -20 up to 105°C and a 12,000 rpm maximum speed, in a 28 mm mounting depth. Resolution is up to 20-bit (single turn) plus 12-bit (multiturn).

The encoder contains both an encoder temperature sensor and an input to allow connection of the motor's winding temperature sensor, adding that information directly into the encoder's data. An internal 'electronic data sheet' in the encoder stores motor and encoder data and can be recalled at any time.

Automated Control Pty Ltd

www.automatedcontrol.com.au

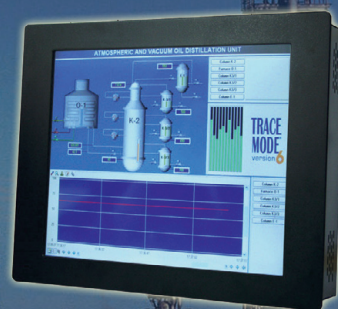
Fanless Computers

**Industrial HMI's, Panel PC's and Embedded Controllers.
Rugged Fanless design, wide temperature range, vibration,
shock, dust and liquid resistant.**

*Stainless Steel Fully Sealed
Water-Proof Fanless Panel PC's*

*HMI's and Panel PC's
From 5.7" to 21" LCD Screens*

*Fanless Embedded Controllers
Including: Atom, i3/i5/i7 Processors*



Interworld
ELECTRONICS
Better systems. Better solutions

www.ieci.com.au
Tel: 03 9593 7555



ACCURACY AND REPEATABILITY IN LINEAR MOTION SYSTEMS

Gary Rosengren, Director of Engineering, Tolomatic

When discussing a linear motion application, many first-time or beginning users will often ask “How accurate is this actuator?” As you will see, the answer is much more involved than simply stating a number.

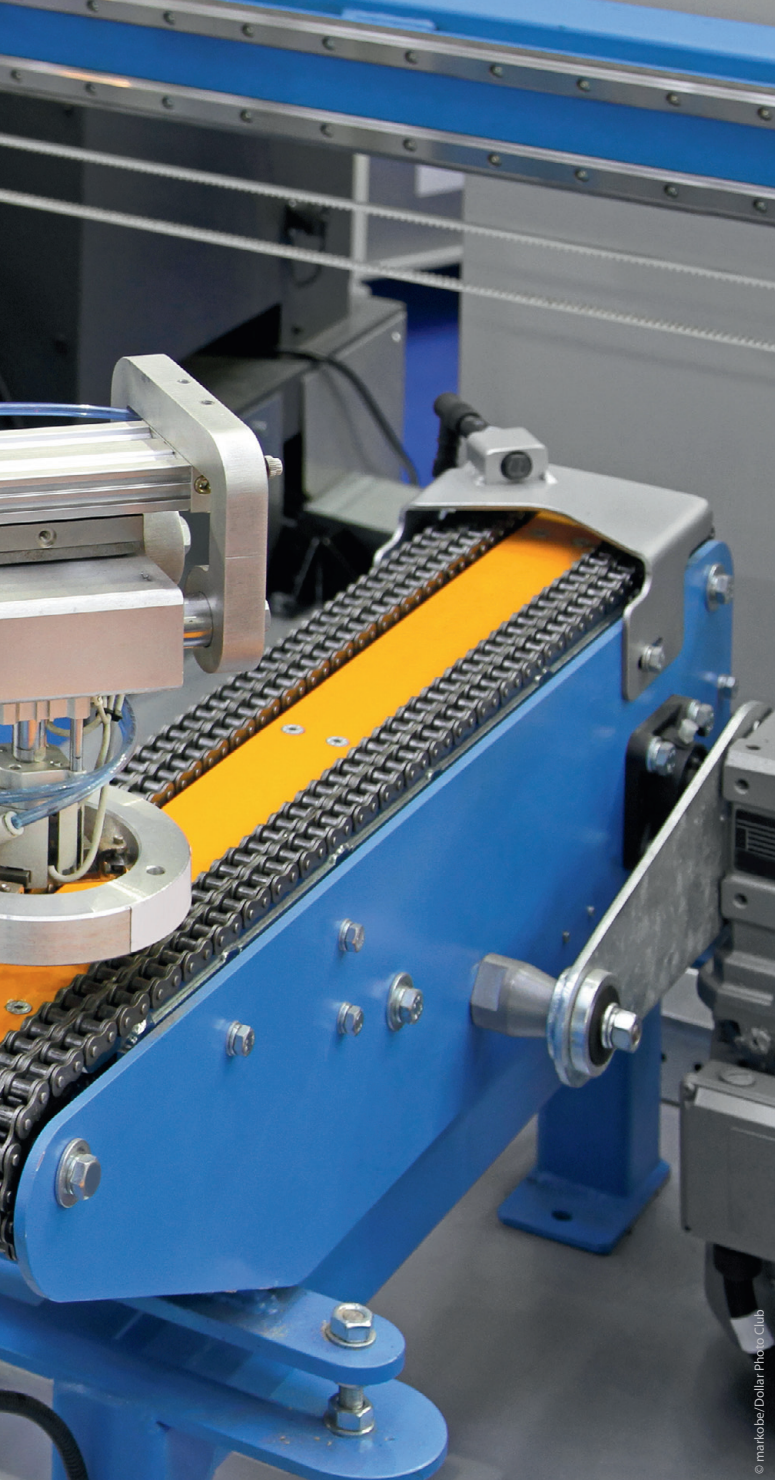
To fully understand the answer to the question of actuator accuracy, we need to get to a basic understanding of the actuator specifications and to what the specifications are really referring. As illustrated in Figure 1, you can see that, while related, accuracy and repeatability are not the same thing. Sometimes repeatability is more important than overall accuracy; the relative importance of the two qualities depends on a thorough understanding of your application.

First, we need to define exactly what parameters to specify. Accuracy refers to the ability of an actuator to achieve a commanded position. Said another way, accuracy is a measure of the error in commanded position versus the actual position achieved. However, positional errors in a single-axis system can come from several sources, such as the mechanical actuator itself, the motor and its encoder and the motor driver. Each of these elements influences the accuracy and repeatability of a linear actuator system. This article will specifically discuss the mechanical actuator platform of an example rodless actuator and how it contributes to accuracy and repeatability.

The motion control coordinate system

Linear actuator hardware may exhibit errors in six degrees of freedom. This is often referred to as the motion control coordinate system. As a first step, the machine designer must decide if it is important to eliminate errors in only one degree of freedom or if the goal is to accurately position the device in three-dimensional space, including all possible degrees of freedom. One way to simplify the understanding is to consider an actuator lying flat on a table. The motion errors that may occur could be in the direction of up/down (the z-axis), side to side (the y-axis) and end to end (the x-axis). Rotation about these axes makes up the remaining three degrees of freedom for a total of six.

When you consider all the possible sources of error and what they represent, the application parameters can seem quite confusing. To help clarify, the applications below examine the basics of an example device. When linear motion occurs, the actuator travels through its length of stroke as determined by the components and methods used in its construction. Linear



actuators need to have some type of structure upon which the actuator components are mounted or attached. This may be aluminium, steel or even granite, as in some high-precision devices. Some actuators are created using extruded aluminium profiles and others may utilise components machined to varying degrees of precision. Attached to this structure are the driving components — such as lead screws or timing belts — along with the appropriate hardware to assure proper function. In the case of an actuator that is intended to carry or support loads such as a tooling fixture or end effector, there will also be some load-carrying components such as bearing rails and bearings. These fundamental components are the basis of the ‘actuator’. Now let’s look at some possible sources of errors.

Accuracy and the linear actuator

All mechanical devices and components have dimensional and geometric tolerances associated with their manufacture. While the worst possible case — where all tolerances are at a maximum — rarely exists, it is important to take all possible tolerances

into consideration for a complete understanding of the system and evaluation of possible errors.

Consider a 305-mm stroke actuator that is manufactured using an extruded aluminium profile and linear ball bearing rails driven by a ball screw. Starting with the extruded aluminium profile, we know that the extruded profile will have some manufacturing tolerances. These tolerances relate to feature size as well as bow and twist.

Attached to the extruded profile are the linear bearing rails. Linear bearing systems will also have manufacturing tolerances that relate to clearances between the bearing and the rail, as well as feature size and parallelism between the base of the rail and the ball ways of the rail. Finally, the driving mechanism is the ball screw. You guessed it: the ball screw and ball nut have tolerances as well. These relate to backlash between the screw and the nut in addition to linear accuracy of the ball thread on the screw. Using this example and starting with the profile, imagine that the feature size tolerance in the motion path is ± 0.0635 mm and all feature deviations must fit within this tolerance range. In other words, the thickness of the extruded profile is allowed to vary by ± 0.0635 mm. Using the worst case scenario, the thickness of the profile is tapered by 0.127 mm from one end to the other, or one end of the actuator is 0.127 mm taller than the other. Or the profile may vary in its thickness or height by that same amount. As you recall from the description of the six degrees of freedom, this is referring to the z-axis. In addition to this feature size variation, imagine that there is also a twist tolerance of 0.127 mm per the 305 mm of stroke possible in the extruded profile. This means that one end of the extruded profile is twisted by 0.127 mm relative to the other. This is referring to rotation about the x-axis. In addition, there is a bow tolerance which allows the extruded profile to have an overall arched shape from one end to the other up to a limit of 0.0635 mm. This comes into effect in the y-axis.

Next in the discussion comes mounting the linear ball bearing rail to the extruded profile. Imagine that the linear ball bearing rail assembly has some small clearance between the bearing balls and the bearing rail. It is typical for this clearance to be in the range of ~ 0.05 mm. However, within the actuator system, it adds to the total error so it cannot be ignored.

Using the worst case scenario suggests that the bearing clearance allows possible error in x-, y- and z-direction, so it’s a good thing this is a smaller contributor! Finally, the ball screw and nut are installed. Assume this ball screw is precision rolled with a non-preloaded ball nut. Backlash of this combination is 0.0762 mm and needs to be included in this evaluation of accuracy.

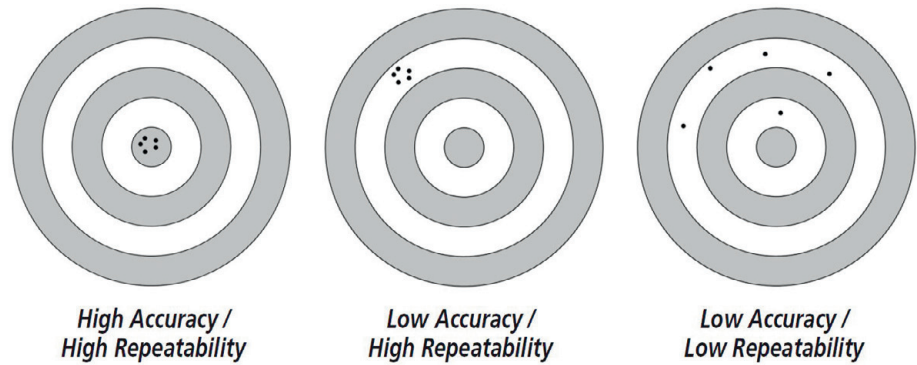


Figure 1: Accuracy versus repeatability.

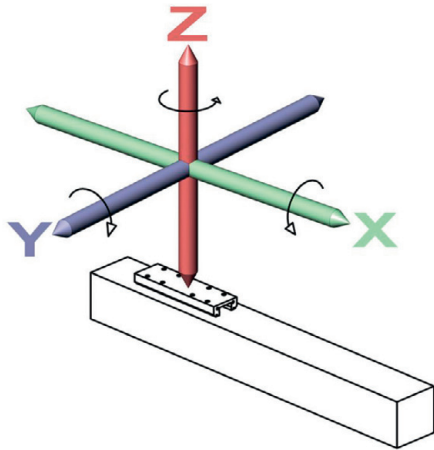


Figure 2: Six degrees of freedom.

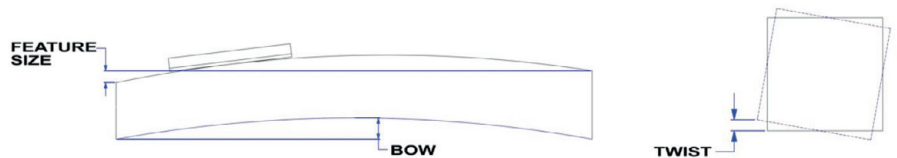


Figure 3: Bow and twist in an extruded aluminum profile.

While backlash is perhaps easy to comprehend, how about the lead accuracy of the screw? Even a precision-rolling process produces lead accuracy variations of the screw component and must also be taken into consideration when evaluating accuracy. Although there are several classes of threads produced by this process, a typical one may be ISO Class 7, which has lead accuracy of 0.0508 mm per 305 mm of travel. Therefore, with this particular ball screw, possible errors along the x-axis due to lead accuracy could be up to 0.0508 mm along its full travel. One way to better understand lead accuracy is that even though you may have commanded the actuator to travel to exactly 304.8 mm, it may have only achieved 304.7 mm.

Does all this potential error really matter? Sometimes it does and other times it doesn't. It all depends on what is important in the application. With all its possible tolerances, the example actuator assembly may therefore not be a good choice when very high degrees of location precision are required. To further explain, imagine the above described actuator is installed in an application where its mounting points were only at the actuator's end points and orientated horizontally. Tooling is then attached to the actuator carriage and extends vertically. In this application, the need for accuracy is at the end of the tooling. When linear motion occurs, it is possible for the tooling point to experience possible errors in the z-axis due to feature size tolerance (0.127 mm), in the x-axis due to twist (0.127 mm) and in the y-axis (0.0635 mm) due to bow. This error is magnified by the fact that the tooling is extended above the actuator carriage. In addition to this, the tooling point also exhibits possible errors due to the ball screw lead accuracy (0.0508 mm) and the ball nut backlash (0.0762 mm). Lead accuracy and backlash both affect possible errors along the x-axis.

So in this example, the above described actuator would be a poor choice for a precision assembly application where parts need to be placed within 0.0635 mm. The same may be true when considering multi-axis configurations where single-axis errors are compounded throughout multiple axes of motion.

Repeatability and the linear actuator

While accuracy is important in some applications' cases, many applications do not require high degrees of accuracy. The point is that these tolerances exist in all actuator systems to one degree or another and must be considered when selecting an actuator. Mounting of the actuator and attention to the orientation of the loads also play a role in overall accuracy and may influence system performance.

Repeatability of the above-mentioned actuator system will be a different matter. Repeatability refers to the ability to return to a predetermined position in successive attempts. Said another way, it is the error in achieving that position time after time. It is possible that a system may not have a high degree of accuracy, as the example above shows, but may in fact have a high degree of repeatability.

Consider applying the actuator described above into a different type of application. The application requirements are that the actuator is positioned in a vertical orientation; is mounted to a known flat surface; is fully constrained; and that there is tooling attached to the actuator carriage, producing an offset load or bending moment to the linear bearing system. Imagine that this application requires the tooling attached to the actuator carriage be positioned in three different defined points at 100, 200 and 280 mm, with each position requiring ± 0.127 mm position repeatability to the required point in space.

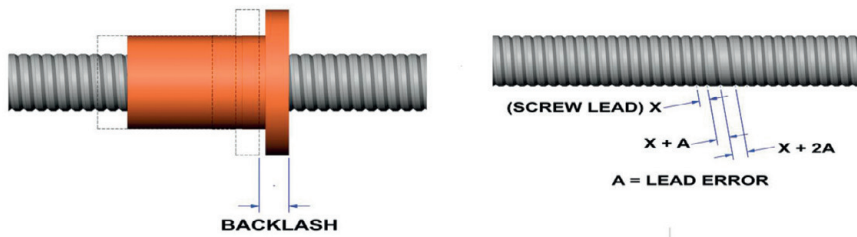


Figure 4: Ball screw backlash and ball screw lead error.



WHEN YOU CONSIDER ALL THE POSSIBLE SOURCES OF ERROR AND WHAT THEY REPRESENT, THE APPLICATION PARAMETERS CAN SEEM QUITE CONFUSING.

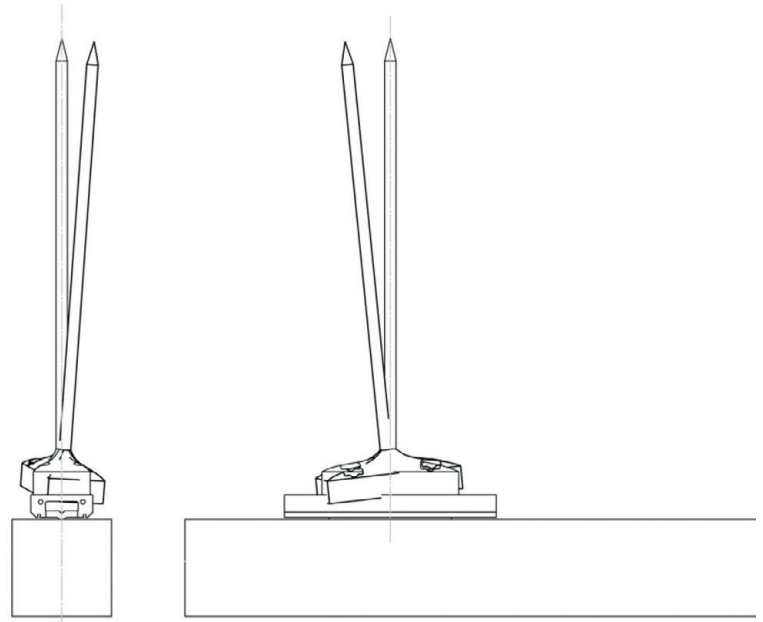


Figure 5: Possible accuracy deficiency.

In this application example, there are several factors which will influence repeatability. For example, because this is a vertical application, ball nut backlash and linear bearing clearances have been mitigated because gravity's effect on the tooling/load will bias backlash and bearing clearance in the downward direction. Remember from the above example that this is referring to the actuator's x-axis. Repeatability in this axis may be considered very high, therefore, because it will relate only to long-term component wear. Once the actuator is required to move to its three defined points, we can evaluate repeatability to those points. Remember that the actuator is mounted to a known flat surface. By doing so, the effects of bow and twist have been mitigated to near zero. This only leaves the tolerance of feature size to consider. Feature size variation of this actuator is 0.127 mm along its travel length. Not only is this within the required tolerance of the motion requirements, it is also not due to change as the actuator structure is appropriately mounted and restrained.

Do you see where this is going? Accuracy, while related, is different to repeatability — particularly when attempting to

achieve a predetermined point in space. In addition, the way each actuator is deployed has significant influence on the results. While there are numerous actuator styles/types available that are manufactured to various degrees of precision and subsequent cost, this example actuator may have high repeatability and deliver excellent performance — even without it being highly accurate.

The key to success, therefore, is understanding what is required in your application and choosing the actuator accordingly. By doing so, you can avoid excess costs and design a system with the best overall value.

Gary Rosengren is Director of Engineering at Tolomatic and has been involved with the design and manufacturing of linear actuators and motion systems for over 30 years. He oversees the Tolomatic Engineering Department and has been instrumental in creating both catalogued and customised products for specific customer needs that employ electric, pneumatic and power transmission technologies.

Pneumatic Products
www.pneumatics.com.au

Processonline.com.au

Your online community – at your convenience 24/7

Search products, articles, news & tech papers with **FREE** access



REFLECTIVE SURFACE INSPECTION

Applications such as touchscreens, instrumentation and controls in cars are built to the expectation of being free from damage. However, the inspection of these parts is often carried out only via visual inspection, which means in many cases the results are unclear and lack accuracy, but reflecting surfaces also pose challenges to automated surface inspection.

The Micro-Epsilon reflectCONTROL Compact is designed for inspection of these types of surfaces and can automatically log and store results to enable objective comparisons.

The fully integrated system is available in two versions that each provide different measuring fields. The 2D version recognises defects on reflecting surfaces, while the 3D version allows the measurement of reflecting surfaces at sub-micrometre accuracies. This device can be used individually in a laboratory environment as well as directly in production lines.

All components are integrated in a compact device with height-adjustable legs. The housing includes a monitor for the striped pattern protection and up to two cameras. In order to avoid interference from ambient light, the measuring field can be darkened on all of the four sides. This operation is performed via touchscreen or mouse and keyboard that can be connected via USB.

The reflectCONTROL Compact reflecting surface inspector can be integrated into a production line via an Ethernet interface, while a digital I/O interface enables triggering. An external operating monitor can be connected via VGA.

Bestech Australia Pty Ltd

www.bestech.com.au



Look what we have for you!

Intelligent incremental encoder with display and IO-Link

Magnetic technology with the precision of optical encoders. Incremental encoder, rotational speed, direction monitoring and counter functions in a single device. Visualisation of the relative position values via two colour display. Resolution of 2 ... 10,000 pulses freely selectable. Fully programmable via display / pushbuttons or IO-Link. IO-Link connectivity for process and diagnostic data.



WARRANTY

5

years

on ifm products

ifm – close to you!

Contact us today! 1300 365 088
sales.au@ifm.com · www.ifm.com/au

Honeywell selected for expansion of major LNG terminal

Honeywell Process Solutions (HPS) has been selected to provide automation and security systems to help Freeport LNG expand its south-east Texas liquefied natural gas (LNG) terminal into a world-class liquefaction and export operation.

Freeport LNG's is one of 10 new or expanded import or export LNG terminals that have been approved by the US Federal Energy Regulatory Commission. The expansion will give Freeport LNG 13.9 million tonnes a year of export capacity. Startup is expected in 2018.

HPS will be the integrated main automation contractor (I-MAC) for the expansion project. In this role, HPS will be responsible for designing, delivering and installing the automation, instrumentation, controls and safety and security systems. The unified approach will be critical in helping the project meet operational and business readiness goals on day one of startup.

"The expanded I-MAC capabilities that Honeywell brings to this project — and specifically our new LEAP project services — will help Freeport LNG start up this terminal expansion faster and within budget," said Pieter Krynnauw, vice president for HPS's Projects and Automation Solutions business. "Honeywell's latest technologies, project delivery capabilities and expert services will create a highly integrated infrastructure to boost the plant's profitability."

The terminal, located on Quintana Island near Freeport, Texas, will build three new processing units, or trains, as part of a more than \$13 billion expansion, adding gas pre-treatment and liquefaction capabilities. Honeywell will supply its automation and control expertise and a unique approach to project consulting and execution to support Freeport LNG's move to exporting LNG in the wake of newly exploited domestic natural gas resources.

"Such a significant expansion of our business requires us to leverage our strategic partners to ensure we develop the safest, most efficient world-class asset," said Michael Smith, chairman and chief executive officer of Freeport LNG.

Honeywell will go beyond the traditional main automation contractor role to include a broader scope of products, services and consulting capabilities that add value over the entire project and operating life cycle of the venture.

Specific key deliverables include a number of Honeywell's innovative and patented technologies, including LEAP, Honeywell's lean project execution services; Experion PKS Orion with Distributed



Systems Architecture (DSA), Experion Security Integrator, Fault Tolerant Ethernet (FTE), Universal Process and safety I/O, virtualisation, advanced control, Safety Manager and fire and gas systems; OneWireless Network; Digital Video Manager (DVM); UniSim operator training simulator; advanced alarm management software; and PHD data historian.

By leveraging these integrated solutions, Honeywell will reduce risks and minimise potential schedule delays for both Freeport LNG and its engineering, procurement and construction (EPC) contractor during the facility expansion's startup. Honeywell has partnered with principals at Freeport LNG for almost a decade to help provide supply chain optimisation aimed at achieving production and cargo deliveries that meet or exceed Freeport LNG's annual delivery plan.

Honeywell offers a broad range of technologies for natural gas production, processing and transportation. Its UOP business provides technology, modular equipment and advanced materials to remove impurities from natural gas so it can be transported by pipeline or as liquefied natural gas (LNG), and to recover valuable natural gas liquids. HPS provides advanced automation, monitoring, safety and security systems for the entire gas supply chain to help operators increase plant reliability and efficiency while reducing costs and risk.

Honeywell Process Solutions

www.honeywell.com

HVAC
Dynapar Veeder-Root Eagle Signal Line Seiki Keyence Maple Greystone Novotechnik TWK AECO
PLCS
Time Count Rate Flow
Encoders HMIs Controllers
ph: 1 300 553 500 enhance your sensors VEEDERLINE www.veederline.com.au

disclaimer notice

All material published in this magazine is published in good faith and every care is taken to accurately relay information provided to us. Readers are advised by the publishers to ensure that all necessary safety devices and precautions are installed and safe working procedures adopted before the use of any equipment found or purchased through the information we provide. Further, all performance criteria was provided by the representative company concerned and any dispute should be referred to them.

ODVA-COMPLIANT ACTUATOR DRIVER

The Tolomatic ACS actuator control solution, an easy-to-use, low-cost servo or stepper driver and controller developed specifically for use with electric actuators, is now ODVA conformant for EtherNet/IP.

Tolomatic electric actuators and ACS actuator control solutions with a servo or stepper driver/controller provide infinite positioning, precise control and longer life. With built-in configurations for all of Tolomatic's electric actuators, linear motion is quickly and easily created in the desired linear units (mm or inch).

The ACS servo and stepper drives are intended to be controlled from a PLC or master controller via 24 VDC digital I/O, 0-10 VDC or 4-20 mA analog I/O, Modbus RTU over RS485, or Ethernet (EtherNet/IP or Modbus TCP protocols).

Recent upgrades to the Tolomatic ACS stepper drive include a 10 A drive, and, similar to the servo drive, USB configuration and the availability of 34-frame motors. Both the ACS servo and stepper driver and controller now feature a 24 V brake output for brake control, allowing the ACS servo/stepper drive to control any 24 VDC external brake through Tolomatic Motion Interface software.

Both the servo and stepper driver/controllers support QoS to improve communication over EtherNet/IP. In addition, both technologies now support EcoMode, which reduces motor current in the motion complete interval (dwell), allowing a slight increase of position error but increasing electrical efficiency.

New features for the ACS drives include add-on instructions for Studio 5000 Logix Designer/RSLogix5000 as well as sample programs for easy commissioning.

Pneumatic Products

www.pneumatics.com.au

HD35 SERIES WIRELESS DATA LOGGERS



- Versions for wide range of parameters Including: °C/Rh/CO/CO₂/Lux/UV.
- Error free transmission with automatic channel selection and data security.
- Remote units with up to 74,000 reading Integral memory and display options.
- Base units with GSM, Ethernet, Wi-Fi and Modbus interfaces with repeater and alarm module options.
- Economically priced, fast delivery & 2 year warranty and this is just the beginning...



W&B Instruments Pty Ltd

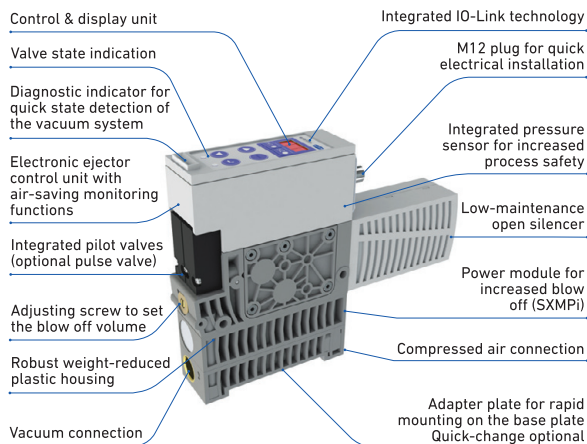


A.C.N. 005 982 856
Factory 4, Enterprise Way, (PO Box 208)
Bayswater VIC 3153
Tel: (03) 9729 2112 Fax: (03) 9720 0617
Website: www.wandbinstruments.com.au
Email: wandbinstruments@bigpond.com.au



VACUUM COMPACT EJECTORS FOR AUTOMATION SOLUTIONS

Compact and robustly constructed



Schmalz X-Pump with IO Link.

FREECALL
1800 99 22 11
components@millsom.com.au
www.millsom.com.au



Scan the QR code for more details about this system.



BULK BAG CONDITIONER

The BLOCK-BUSTER hydraulic bulk bag conditioner from Flexicon conditions bags ranging from short to extra tall using hydraulically actuated rams that automatically adjust in height during conditioning cycles.

The rams of the updated design provide approximately 2 m of vertical travel — said to be double the range of most conditioners employing scissor lifts to raise the bag — while the fixed-height turntable reduces loading deck height by about half.

The user can program single or multiple heights at which the rams condition the bag, the amount of pressure applied by the rams' contoured end plates, the frequency of ram actuations and the number of 90° rotations of the turntable, loosening solidified materials throughout the bag for discharge through the bag spout. The system controller can be mounted remotely or on the exterior of the safety cage, which incorporates full-height, interlocked doors.

The unit measures 221 x 338 x 198 cm, requires only an electrical power connection for operation and is available constructed of stainless steel or carbon steel with durable industrial coatings.

Flexicon Corporation (Australia) Pty Limited

www.flexicon.com.au

VALVE CONNECTORS

The Hirschmann GDM-Series valve connectors enable a wide range of automation components to be reliably powered and connected to the data network, which increases the overall productivity of machines and systems.

The connectors are offered in type A and are available either with protective circuitry or in a version with additional LEDs. Both versions provide maximum protection for machine building, automation and equipment manufacturing applications. The connectors are able to provide secure solutions for a wide range of environmental conditions due to their configurability. They are quick to assemble and offer high operational safety by protecting downstream electronic components.

The valve connectors offer a simplified cable connection and reliable contacting. They can be assembled on site and have high shock and vibration resistance, as well as extensive resistance to chemicals and UV radiation. Easy-to-grip housings ensure the connectors can be rapidly assembled. Rounded edges make it difficult for dirt to accumulate and ensure that it can be easily removed.

Belden Australia Pty Ltd

www.belden.com



FREE SUBSCRIPTION

What's New in Process Technology is **FREE** to qualified industry professionals in Australia and New Zealand.

To **continue** receiving your free copy you will be asked to register every three years.



QUICK REGISTRATION @ www.ProcessOnline.com.au/subscribe



DIGITAL DISPLAY UNITS

The digital display units in the HDA 5500 series are microprocessor-controlled display and monitoring instruments designed for control panel installation.

Different versions are available with a maximum of three analog inputs, an analog output (4-20 mA or 0-10 V) and up to four relay outputs. The analog input signals are displayed according to the settings selected by the user. Each of the relay outputs can be allocated to each of the sensor inputs or to the differential between inputs 1 and 2.

A PT 100 temperature probe can be connected directly to the instrument. There is also an option for frequency measurement using the Hydac HDS 1000 rpm probe; eg, to measure the speed of rotating components. Depending on the model, it is also possible to connect SMART sensors (condition monitoring sensors). SMART sensors are a generation of sensors from HYDAC which can transmit several different measured values.

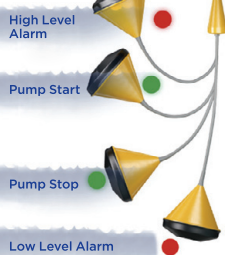
The HDA 5500 series instruments have an accuracy of $\pm 5\%$, as well as a clear 4-character, 7-segment LED display and an RS232 interface. The units can be powered from a 12-32 VDC supply or 85-265 VAC.

HYDAC International
www.hydac.com.au



Reliable pump and valve control delivers switched on level solutions

- No more tangles – up to four switches in one float
- Choice of three different sized floats to ensure enough buoyancy for your application – ranging from clean to black water.
- Wide range of output configurations: high / low level alarm, pump control & gold plated contacts for low voltage / current applications (e.g. battery powered telemetry systems).
- Perfect for sumps, sewage, water & wastewater treatment, power stations & silo (solids) monitoring



CCEZY.COM.AU +61 2 9542 8977
Distributors through Australia and New Zealand



POWER QUALITY METER

The PowerLogic PM8000 series power meter is the latest addition to the PowerLogic range of power and energy meters. In

accordance with power quality standards IEC 61000-4-30 Class S and IEC 62586, the PowerLogic PM8000 series meters are designed to help ensure contractual obligations for electrical supply quality. The meters also have extensive power quality analysis capabilities, such as EN 50160 compliance, sag/swell detection, waveform capture, disturbance direction detection, trending and forecasting.

If a power quality (PQ) event occurs, the patented disturbance direction detection feature helps identify the location by determining if it occurred upstream or downstream of the meter, allowing the problem to be corrected faster.

Engineered on a compact, modular and flexible platform, the PowerLogic PM8000 series meters have the versatility to perform nearly any metering job at key points throughout a facility. The meters are compliant with ANSI C12.20 Class 0.2, IEC 62053-22 Class 0.2S (real energy) and IEC 61557-12. Accuracy combined with the meter's extensive I/O options makes the PM8000 series meters suitable for the unified metering of all WAGES (water, air, gas, electricity and steam) utilities. Meters are available in both panel-mount and DIN rail-mount form factors, and have high-visibility colour displays.

Schneider Electric Industry Business
www.schneider-electric.com



DUAL-BAND WIRELESS ROUTER

The Moxa WDR-3124A is a wireless router that combines both WLAN and WWAN connectivity to ensure that wireless devices remain connected. The product's auto-switch failover function enables automatic switchovers between 802.11n and HSPA standards, ensuring wireless availability for mission-critical systems.

Many industrial applications rely on moving equipment during operation, but long-distance transmission between remote stations is subject to Wi-Fi access failures and cellular communication can be expensive.

The WDR-3124A combines both 802.11n and HSPA connectivity for seamless auto-switch failovers so operators can set Wi-Fi as the primary connection and automatically switch over to cellular if the Wi-Fi link goes down. This not only ensures seamless connections, but also reduces costs for cellular airtime since the cellular connection is only used when the Wi-Fi network is inaccessible.

To ensure wireless LAN and WAN connections, the device also supports Moxa's Turbo Roaming technology for seamless Wi-Fi roaming within milliseconds. Dual SIM card slots with GuaranLink technology ensure reliable cellular transmissions.

Madison Technologies
www.madisontech.com

Nobody manufactures 6mm safety relays ... UNTIL NOW!

NEW PSRmini HIGHLY COMPACT SAFETY RELAYS

No wider than 6 or 12 mm,
 the new safety relay with force-guided
 contacts offers enormous space-spacing
 potential of up to 70% at full capacity.



www.phoenixcontact.com.au/mini | 1300 786 411

**PHOENIX
CONTACT**
 INSPIRING INNOVATIONS

AS I SEE IT



REMOTE ACCESS TODAY

Australia is a tricky market. Whether you're a contracted engineer, systems integrator or OEM machine builder, our small population density and the vast distance between existing and potential clients can often be great.

With the market becoming saturated and a decline in manufacturing, it is becoming evident that businesses are needing to focus on more efficiency, making the most of their existing assets and their employees' skill base.

How much time do you or your employees spend travelling between sites commissioning, running diagnostics, making repairs/upgrades or collecting machine data? To me, these travel costs are detrimental to both the client and service person — additional fees and time that neither should have to spare. How much money would your business save if you cut travel costs by even 2%?

Enter remote access. It has been around for a long while and M2M communications are not new. We've moved through technologies like dial-up modems, VHF radio and 2G networks. These connection media have made M2M difficult to use, maintain or even implement.

Low-speed connections and unintelligent hardware also severely limited remote access functionality, capability and security. Because of this, remote access has generally been limited; its use often reserved for the most remote sites, where the equipment is basic and non-vital.

Many companies have noticed the growing trend towards remote access and a need for a more powerful, easy-to-use solutions. We can now see an ever-growing selection of devices with all sorts of functionality, and, with 3G now covering most of the continent, speed is no longer an issue.

Many of the manufacturers are using centralised servers to manage IP addresses and user access, removing the requirement for purchasing static addresses or manually dialling devices.

So what should you look out for when researching which device is best for you? A few things you should consider for your application when looking at what's in the market, in order of importance, are: security; features; ease of use; fast set-up and deployment; scalability; robustness; unit cost; and power consumption.

Figure out your needs — some remote access solutions offer a myriad of features and others are essentially just basic dialling devices. Some extras you should expect to see around are SMS alerts, VNC support, a variety of hardware connection types, server relay capabilities and failover internet connections.

In most applications you simply cannot compromise on security when looking at remote access. Without proper measures, you could be leaving hardware open to the public or even passing critical information over insecure media. There are minimum IEC standards that public sector companies have to adhere to and I'd suggest exercising the same level of caution. Furthermore, I rate ease of use and ease of deployment highly above cost: if it's not easy to use, then your savings on a difficult product may very well be wasted on setting up devices and training.



Tom Hardy is an Applications and Support Engineer at Daanet, providing sales assistance and technical support on Daanet's entire product offering. Tom also fulfils the role of Product Manager for Secomea, where he manages the portfolio of products and services through all the various phases of the product life cycle. He holds both an Advanced Diploma and Bachelor's Degree in Electronics and Communications Engineering.



A.B.N. 22 152 305 336

Head Office

Cnr. Fox Valley Road & Kiogle Street,
(Locked Bag 1289)
Wahroonga NSW 2076
AUSTRALIA

ph: +61 2 9487 2700 fx: +61 2 9489 1265
www.westwick-farrow.com.au

Editor

Glenn Johnson
wnipt@westwick-farrow.com.au

Chief Editor

Janette Woodhouse

Publisher

Geoff Hird

Art Director/Production Manager

Julie Wright

Art/Production

Tanya Barac, Colleen Sam

Circulation Manager

Sue Lavery
circulation@westwick-farrow.com.au

Copy Control

Mitchie Mullins
copy@westwick-farrow.com.au

Brand Manager Industrial

Nicola Fender-Fox

Advertising Sales

VIC

Sandra Romanin - 0414 558 464
sromanin@westwick-farrow.com.au

SA/WA/Asia

Lachlan Rainey - 0402 157 167
lrainey@westwick-farrow.com.au

QLD/NSW

Nicola Fender-Fox - 0414 703 780
Nfender-fox@westwick-farrow.com.au

Subscriptions

For unregistered readers price on application.
If you have any queries regarding our privacy policy please email
privacy@westwick-farrow.com.au



March 2015 total CAB audited circulation (Aust + NZ)
6,230 readers (70% personally requested)



Contact the editor

Printed and bound by SOS Print+ Media Group
Print Post Approved PP100007403
ISSN No. 0819-5447

All material published in this magazine is published in good faith and every care is taken to accurately relay information provided to us. Readers are advised by the publishers to ensure that all necessary safety devices and precautions are installed and safe working procedures adopted before the use of any equipment found or purchased through the information we provide. Further, all performance criteria was provided by the representative company concerned and any dispute should be referred to them.

Information indicating that products are made in Australia or New Zealand is supplied by the source company. Westwick Farrow P/L does not quantify the amount of local content or the accuracy of the statement made by the source.

At \$3.52 billion



do you want
a piece of this pie?

By 2019 the global field service market is forecast to be worth \$3.52 billion *

Field Service Business delivers the latest breaking news, product innovations & industry expertise to Australian service professionals managing, resourcing & enabling mobile workers.



Register now for your free email newsletter, print magazine or eMag: www.fieldservicebusiness.com.au/subscribe

* Feb 2015 research by Markets and Markets



FIELD SERVICE BUSINESS

managing, resourcing & enabling your team in the field



WELCOME TO VISUAL REALITY



SIPOS SEVEN: the new benchmark in electric actuators

The future requires visionary solutions.
With the SIPOS SEVEN this becomes a reality.

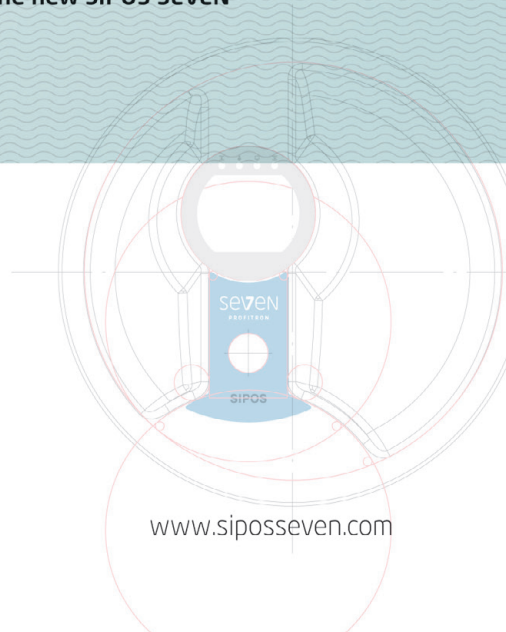
Designers, valve manufacturers and plant operators will all benefit from innovations including an easy to read, color graphic user interface and intuitive operation via a single control button.

Stay Ahead
With the new SIPOS SEVEN

BARRIN

STAY AHEAD. STAY SIPOS

78 Dickson Avenue, Artarmon NSW 2064
Telephone: +61 2 8437 4300, Facsimile: +61 2 8437 4333
info@barron.com.au



www.siposseven.com