

April 2018 Issue 55

Automation

TODAY

South East Asia

Inside

Upgrading Plant Brings
Improved Safety and Productivity

Ready to Simplify
Machine Safety?

Smart Sensor for
Smart Factory



Smart Safety

in The Connected Enterprise

Rockwell
Automation

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It's a New Start and We Start Smart



●●● In the era of digital transformation, everything is interconnected. In today's
smart factories, smart equipment communicates with other equipment,
smart machines control themselves, and processes are becoming increasingly
agile. However, the more complex industrial plants become, the more rigorous the
requirements that are imposed on functional safety.

Therefore, safety systems must be just as smart as the production processes of the
future. They use big data to control and optimize themselves and make it possible to
more effectively utilize plant capacity and operate plants more profitably.

As the world-class provider of industrial safety automation, Rockwell Automation
works with a growing number of industrial producers that have started on a smart
manufacturing journey. Through our innovation, experience, expertise, we are
helping them use Industrial Internet of Things (IIoT) to realize the vision and benefits
of The Connected Enterprise.

We believe that this year, the manufacturing industry is going to make steps
toward the 'Smart Factories'. Perhaps the most significant technological shift we will
see across the industry in 2018 is the increasing adoption of smart machines and
equipment by manufacturers of varied size across the sector.

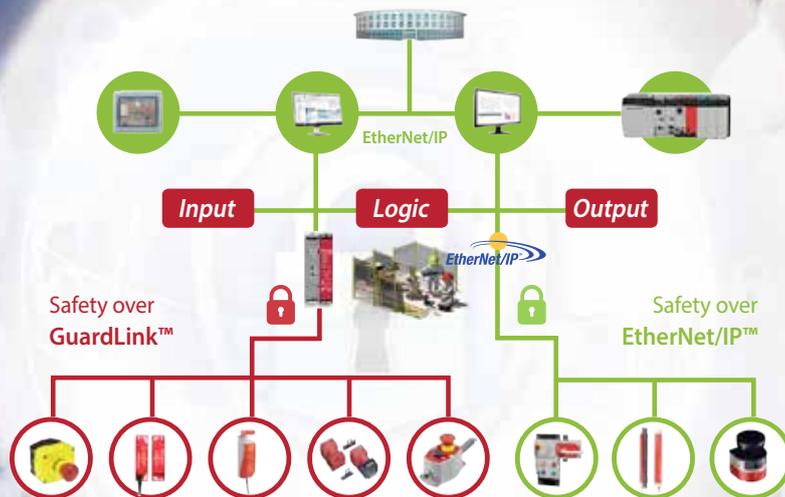
Rockwell Automation has prepared and developed a complete set of intelligent
technologies and service for manufacturers to select and use as a journey starter. By
leveraging the smarter devices and tools and making safety a core function of their
machines, those companies who are already on their way can even go further.

I invite you to review this issue of Automation Today Asia Pacific to learn how
smart devices and components work in a Connected Enterprise and how they can
improve safety, contributing to the success of your operations.

Joseph Sousa, President
Asia Pacific Region, Rockwell Automation

LISTEN.
THINK.
SOLVE.®

[SMART SAFETY]



*The Connected Enterprise
Industrie 4.0*

SAFETY Has Never Been This **SMART**:

Enabling smarter machines for use in The Connected Enterprise.

Access to real-time data and seamless connectivity is transforming the production environment. Smart capabilities enable end users to gain new efficiencies, improve product quality and make operations more responsive. Rockwell Automation provides a complete Smart Safety solution to meet safety requirements, covering safety input devices, safety logic and safety output devices based on standard networks.

With our Integrated Safety solution, you can now access more diagnostic data and simplify your wiring system.

See how Smart Safety can make the difference
www.rockwellautomation.com

**Rockwell
Automation**

 **Allen-Bradley** • Rockwell Software

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Rockwell Automation Recognized as the Reader's Choice



●●● It is the people and technology that come together to make Rockwell Automation a top choice for manufacturers and end users. Earlier this year, the company received great honors from the key trade media and their readers.

In January, Control Magazine announced their 2018 Readers' Choice Awards winners. Rockwell Automation was the only supplier that ranked within the top three for all six categories and had the most first-place wins for every category within the metals, minerals and mining industry.

For the 2018 Engineers' Choice Awards, eight products were awarded to Rockwell Automation from subscribers of Control Engineering magazine. The company's Allen-Bradley® safety light curtain system and FactoryTalk® TeamONE mobile application received honorable mentions.

Readers of Automation World have chosen their preferred suppliers across a range of automation technologies for the 2018 Leadership in Automation program and Rockwell Automation was named to the Automation World "First Team."

Rockwell Automation has held the honor each year since the program's survey was first launched. Eight years ago, the company earned a place in 13 categories; as the survey has expanded throughout the years, it has been recognized in and earned a place on the 2017 First Team in 21 categories.

World's Most Ethical Company Shows Exemplary Leadership

●●● This year, Rockwell Automation was recognized by the Ethisphere Institute as one of the World's Most Ethical Companies and listed as a member of the Dow Jones Sustainability North American Index. This is the tenth year that the Ethisphere Institute has named Rockwell Automation to the distinguished list of 135 global companies that influence and drive positive change and improve ethical leadership and corporate behavior.

"Integrity and honesty is part of our corporate DNA, and I am proud that Ethisphere is again recognizing the work our employees do to live our company's values every day," said Blake Moret, Chairman and CEO, Rockwell Automation. "Acting with integrity, ethics and respect for each other is not only the right thing to do, but it is also an imperative for growing our company as we provide long-term value."

The Rockwell Automation 2017 Corporate Responsibility Report is now available online and in print. The report details the company's approach to corporate responsibility and sustainability, including its culture of integrity and ethical business practices.



2017 Global Honors

- Honored with 2017 Catalyst Award
- Ranked 66th on 2017 Management Top 250 list of The Wall Street Journal
- Listed in China's Top 100 Most Attractive Employers for the fifth time
- Received a perfect score of 100 percent on the Human Rights Campaign's 2018 Corporate Equality Index for the sixth consecutive year
- Listed among the 30 top companies in the U.S. in Newsweek Green Rankings

Top Plant: A Combination of Metrics and Culture

●●● Plant Engineer, a popular magazine among manufacturing managers and engineers, honored the Rockwell Automation plant in Twinsburg, Ohio the 2017 Top Plant.

The complexity of the products and the speed of the manufacturing processes, combined with world-class quality levels, make the plant a very high performing one within Rockwell Automation and within the industry. To earn the title, the Twinsburg plant proved to have positive performances in many key aspects of manufacturing management, including the people, products, operation management and advanced technology.

The Connected Enterprise is the Rockwell Automation term of the overall umbrella of systems; Twinsburg plant practices this vision to make sure they connect people, processes and technology. It has plant-wide daily startup meetings and topics include safety, quality, service and cost. "Normally, our meeting starts with safety because you can have great numbers, but if your employees are at risk, then



everything is meaningless," said German Mendez, Twinsburg plant manager. "Then we will talk about quality, performance from the previous shift or day, efficiency, labor utilization, service, and the priorities for the day."

Operating since 1979, the Twinsburg plant manufactures products such as programmable logic controllers (PLCs), electronic operator interfaces, input/output (I/O) devices, and a variety of distributed, on-machine products.

"The plant has experienced consistent productivity improvements," said Brian McCaffrey, project manager at Twinsburg. "An example of this productivity is in our electronic assembly area. Using roughly the same amount of equipment and manufacturing associates, we have significantly improved the quantity of components."

Orchestrated Data Transforming Production and Supply Chain

●●● Industrial executives from around the globe gathered in San Diego, U.S., at the Industry of Things World USA event on March 7-9. At the event, Rockwell Automation shared its learnings on how to approach IIoT to create new business opportunities.

During the three-day conference, Rockwell Automation leaders led roundtable discussions and made presentations on how to best orchestrate data to improve operations. The company's knowledge comes from tapping experience as both a provider of IIoT solutions and services, and as a manufacturer that has applied innovative IIoT strategy across global production processes.

"We've come a long way in connecting our enterprise. As a result, we've doubled labor productivity annually and increase on-time deliveries by 19 percent," Bob Murphy, senior vice president of operations and engineering, Rockwell Automation, said in his keynote address. "Now, we are targeting our broader supply chain capabilities by increasing our sourcing to fulfillment connectivity to improve our predictability and productivity while decreasing time to market."

Also, Rockwell Automation specialists exhibited data management, scalable analytics and IIoT strategy case studies, solutions and services during the event.

As a platinum partner of IoT World events, the company will again be presenting at IoT World Asia 18 on July 16-17 in Marina Bay Sands Hotel, Singapore. This event is part of the award-winning IoT World global event series and has turned into the meeting point for industrial senior executives' wanting to deepen their knowledge of the Industrial Internet of Things.

Smart Motion Control Approach

●●● To show global manufacturers and customers how to enhance productivity using intelligent motion systems, Rockwell Automation demonstrated an independent cart technology at the Automation Technology Expo West (ATX West) in Anaheim, California, U.S., on February 6-8.

The company exhibited the MagneMover® LITE intelligent conveyor system and iTRAK® intelligent track system which can help manufacturers achieve new levels of throughput and process optimization. Machines builders can use the system's independently controlled moving carts to customize operations to specific customer needs.

These intelligent motion systems can be used in assembly, process, test and manufacturing applications in the medical device, assembly, automotive, pharmaceutical, packaging and optical industries. The application demonstrations at the Expo showed the visitor how the systems can help end users reduce their energy usage and machine footprint size.

A Chance to Gain Insight into Smart Manufacturing

●●● The Rockwell On The Move (RAOTM) 2018 Conference was held on January 31 at The Leela Ambience, Gurugram, India. More than 1,000 attendees across India came to join the event and discovered the latest technologies and services from The Connected Enterprise portfolio.

The event hosted executive forums where industry leaders, analysts and Rockwell Automation with its strategic alliance partners shared their views on industry drivers, trends and how Connected Enterprise is bringing the Industrial Internet of Things (IIoT) to life for companies and can turn marketplace challenges into advantages to drive Make In India vision.

Various technology sessions and hands-on labs covered a myriad of topics such as 'New Technology Innovations to Bringing The Connected Enterprise', 'Improving Productivity Using Contemporary Safety Designs' and many more. Attendees were able to try out the latest updates and new functions of the company's innovative solutions such as FactoryTalk® View SE and ViewPoint, Studio 5000®, ThinManager®.



AP Customer Events Calendar – Upcoming in Apr – Aug 2018

Event	City/Country	Date
Rockwell On The Move (RAOTM) 2018	Seoul, Korea	10 May
IIoT Forum	Taipei, Taiwan	9–11 May
SEMICON	Kuala Lumpur, Malaysia	22–24 May
Rockwell On The Move (RAOTM) 2018	Nanjing, China	23–24 May
RAOTM 2018 for Metal Industry	Dang-jin, Korea	24 May
6th Asia Drink Conference	Bangkok, Thailand	15 June
Rockwell On The Move (RAOTM) 2018	Hanoi, Vietnam	24 July
Rockwell On The Move (RAOTM) 2018	Ho Chi Minh City, Vietnam	2 August

Each event is subject to change

To see up-to-date event calendar, visit:

www.rockwellautomation.com/global/events/overview.page

Leverage 3-D Imaging Technology for Sensing and Safety Applications

●●● Late last year, Rockwell Automation announced that the company had acquired Odos Imaging, a Scottish technology company that provides three-dimensional, time-of-flight sensing systems for industrial imaging applications.

Rockwell Automation will apply this technology to sensing products to deliver solutions to a broad range of demanding industrial applications including automotive and general assembly, packaging and material handling, and logistics.

"This acquisition enables us to build on our portfolio of smart sensing and safety products, an important part of the foundation for The Connected Enterprise," said Lee Lane, Rockwell Automation vice president and general manager, safety, sensing and connectivity business. "It enables us to expand our existing capabilities by bringing 3-D time-of-flight sensor technology to industrial applications."

Smart Safety in The Connected Enterprise

In The Connected Enterprise, smarter and more responsive machines and equipment help enable transformation of monitoring and managing safety.

●●● The Industrial Internet of Things (IIoT) is revolutionizing manufacturing. Once composed solely of mechanical and electrical parts, machines and equipment have become complex systems made by improvements in processing power and device miniaturization. Those smart and connected machines are information enabled and they allow manufacturers to better leverage an important asset - their own real-time data.

The emergence of smart machines and equipment is transforming how manufacturing and industrial organizations operate. They provide unprecedented access to data that has long been trapped. This data can be collected, logged and analyzed to help workers make better business decisions.

When connected via an open and standard network architecture, such as EtherNet/IP™, they provide greater connectivity. This enables real-time collaboration and seamless data sharing across all levels of an organization's enterprise.

And since real-time data can be turned into actionable information, manufacturers are not only given the status, but the condition of the machines, hence they can better understand their operational performance and ultimately help optimize the manufacturing process.

More Than Just Being Connected

In the era of smart manufacturing, with greater requirements for production and machine information comes the need for industrial grade

smart devices.

But just because the devices have a network connection, does not mean they are "smart." It is a combination of intelligence, value, and ease of use that make a smart device a better choice for industrial manufacturers than a conventional one.

Smart devices are created to make intelligent decisions and to offer value to the user. They have the ability to connect manufacturers with data that can show insights into the operation process and provide predictive as well as preventive analytics based on the data.

When there are so many devices and parts within a plant, they must be easy to use. Machine operators and engineers can expect the smart devices to be easy to handle and function with minimal or no maintenance; and in case an upgrade is required on a device, it can be as smooth as possible. Also, they can be easily integrated into an automation control system and network, providing a more simplified way for engineers to design the machines.

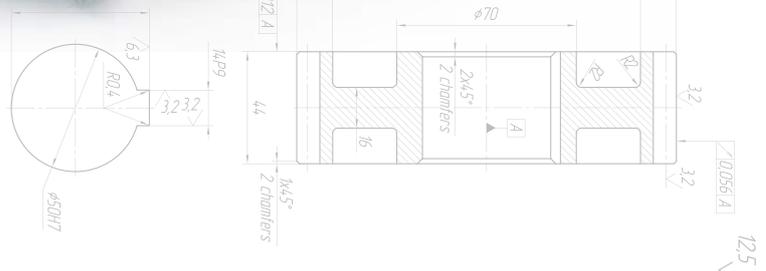
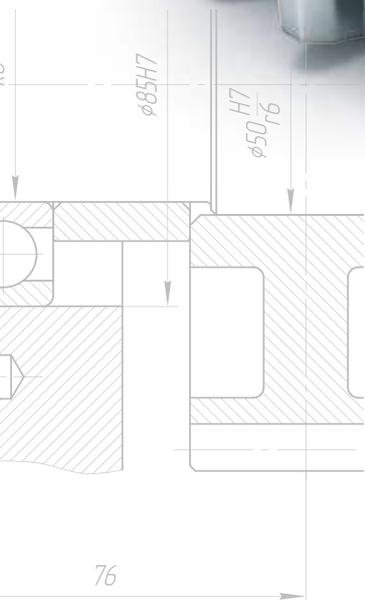
Safety Matters

Today, best-in-class companies view safety as a key element in their pursuit of operational excellence. Researchers found that these companies have seen operational improvements resulting from the use of advanced safety technology.

Enabled by the IIoT, smart devices with better communication capability are providing real-time data – from the component to the enterprise level,



prise



which can be converted into information-enabled management tools. However, what effect will it have on machine safety, and more importantly, how can safety systems contribute to this new paradigm?

Through industrial communication protocols and Ethernet networking capabilities, safety is now a much more integral part of modern manufacturing control solutions and effectively coexists on the same network used by the automation, process and motion control architectures.

Indeed, holistic safety practices, including those that incorporate tighter integration with existing control architectures, regularly demonstrate a positive effect on the bottom line and play a huge role in the general wellbeing of the plant, the machines and the employees who operate them.

Safety Data in Hand

Actionable manufacturing data on machine performance normally is made up of factors such as speed and throughput, with safety systems

Smart Machines and Equipment



traditionally delivering stop/go or safe/unsafe signals. But with smart safety devices, it is more than just seeing on or off status and the delivery of intelligence, based on usage, life, degradation and performance drops.

Smart safety devices and their associated data sets have the ability to become a key element of this revolution thanks to their ability to share operational data that is outside the bounds of that already being collected. Using this information, safety professionals can improve how they approach safety by using safety-system data and the greater connectivity

available within a Connected Enterprise.

Monitor Worker Behaviors: Safety system data can help identify discrepancies between how policies and procedures are defined and how workers actually follow them. Similarly, it can identify discrepancies between how safety technologies are designed and how workers actually use them.

Workers may be misusing an emergency stop (e-stop), for example, to clear jams or stop production at the end of a cycle. This misuse can lead to increased scrap and longer machine start-up times, resulting in a production loss.

In a Connected Enterprise, safety professionals can collect an e-stop's activation time stamp and downtime duration, as well as the line and shift associated with each activation. They also can create stoppage-reason codes to identify why a machine was stopped, such as for jams, misfeeds, cleaning or other reasons. They then can analyze this data in their existing metrics and alarms and events software to determine whether e-stops are being used at an abnormally high rate. Or they might discover that higher activation rates are associated with specific production lines or shifts.

With these findings, safety professionals can take whatever correction action is needed, whether it is providing additional training, revising standard operating procedures or updating a machine design. This same information may point to potential improvements in procedures or process, resulting in

Need More Production Information?

When manufacturers identify what data needs to be captured, they can determine how it will be collected and delivered to help optimize their operations.



Embedding smart devices and components into machines offers new ways for customers to help increase machinery life cycles and decrease downtime. These devices can use built-in functions, such as vibration and condition monitoring and torque signatures, to identify issues before they become problems, and to help quickly troubleshoot and repair issues that do arise.



HMI faceplates with system-wide diagnostics and easy-to-understand display screens keep operators informed of system performance and provide early detection of system errors to help ease maintenance and troubleshooting.



Expanding traditional system access by using mobile technology helps operators be more productive and collaborative. It empowers manufacturing operators, managers and supervisors to make timely decisions no matter where they are located.

a “best practice” that could be adopted as a standard operating procedure.

Enhance Safety Performance: Safety professionals can use real-time data and connectivity to help improve safety performance in many ways.

For example, employees who work with hazardous materials or in harsh conditions can use real-time data to monitor and track potentially dangerous environmental conditions or manufacturing process states. In addition, the ability to deliver information to workers through mobile or wireless technology can help improve ergonomics or reduce the strains put on an aging workforce.

Remote monitoring of isolated or dispersed operations also can help reduce the need for workers to travel between sites, such as to check on wellheads, pump stations and storage sites in the oil and gas industry.

In some instances, network connectivity could be a company’s last or only link to their employees. Wearable sensors, for example, could be used to locate workers during emergencies in underground mines or other hard-to-reach places. Voice, video and display technologies also could help companies monitor and communicate with workers following a safety incident.

Better Understand Safety Risks: Risk-assessment data rarely is used outside the machine-design stage. But in a Connected Enterprise, it can take on a new role in the form of a safety calculator. It’s an innovative yet simple tool that safety professionals can use to measure anticipated risk against actual risk for each machine access point.

First, the calculator can be configured easily as a basic table within enterprise manufacturing intelligence software. Then a safety professional can enter a risk assessment’s anticipated use-frequency data as the baseline for safety performance and compare it against the machine’s actual use-frequency data. This can be done for individual safety functions such as operator access points and gates, quality check points and e-stop devices.

Lower-than-expected use frequency could indicate that a safeguard is being defeated and needs to be re-evaluated. Higher-than-expected use frequency could indicate that a product or process change needs addressed. Any usage outside of the expected frequency or duration could represent a compliance issue or, conversely, an opportunity for process improvement benefiting production.



Ease Compliance: Auditing safety data manually for compliance and reporting purposes can be a time-consuming process and subject to human error.

But now companies can speed up the auditing process by integrating their auditing functions into the operator interface and controller. In addition to saving time, this can free up personnel for other priorities and reduce the likelihood of manual data collection errors. Since detected abnormalities can be annunciated in operator interface dashboards or reports, automated auditing also can help workers identify and address potential issues in their plants more quickly. This is because the information is monitored and pulled regularly, making for faster and improved decision-making.

Make Smart Manufacturing Possible

There are still many companies that do not realize that safety can play a bigger role in optimizing plant operations, especially as part of a smart factory that leverages a Connected Enterprise approach. But now the smart safety devices are helping show that safety does hinder productive manufacturing.

As manufacturers and end users pursue greater speed, scale and simplicity across every area of their operations, they start turning to smart machines and equipment. More connected devices will continue to create more opportunities, and the seamless integration of smart devices, control, software and analytics can help them meet today’s smart manufacturing goals, while also preparing them to take advantage of greater connectivity in the coming years. **AI**

Upgrading Plant Brings Improved Safety and Productivity

Two industry leaders successfully enhanced safety and productivity when installing innovative safety solutions in aging plants

●●● Imagine smart factories where robotics arms and conveyors never break down and production targets are never missed – all thanks to Internet-connected devices and components that monitor machine health and respond to any possible errors.

But for the vast majority of manufacturing plants, the reality could barely be more different. There are factories still running on decades-old machinery that is not outfitted with smart devices.

There are no ready-made solutions for getting from where most of the manufacturers are now to smart factories. The transformation requires a deep understanding of each machine's functions and the metrics to be tracked, trial and error to determine the right equipment to use and the best place to put it, and a comprehensive plan for collecting and making sense of the data.

With the advancement of industrial technologies, Rockwell Automation has developed scalable and smart solutions to help original equipment manufacturers (OEMs) start and move forward on their journey of smart manufacturing.

The Time Has Come

Asaleo Care is a leading personal care and hygiene company that manufactures essential consumer products that are used daily in households and businesses across Australia, New Zealand and some other countries in the Pacific. Since 1955, its plant in Kawerau is the only tissue base paper manufacturer in New Zealand.

The company is committed to introducing the latest technologies to their 11 plants and facilities to continue to produce quality products and meet evolving safety standards. As they decided that it was time to address the obsolescence



GuardLogix safety controllers met all the safety and control requirements for the press

issues and turn to smart manufacturing, Asaleo Care called on Rockwell Automation to design, manufacture and commission a control and drive upgrade to their tissue machines. "We must stay competitive in order to remain in business over the long term and that is a key reason for the upgrade," stated Paul Stevenson, electrical engineer, Asaleo Care.

Driving Safe Production

The existing drive system at the Kawerau plant was an analog, direct current system, requiring periodic maintenance. Being 30 years old, it was also facing obsolescence. Over the years they became familiar with the processes required to maintain the system, but still they had to replace the brushes quite often.

Rockwell Automation helped the company assess the issue and possible risks and leveraged its application knowledge to engineer a solution that incorporated the latest technologies. A new system was designed to take into account various factors relating to the old AC drives system such as excessive electrical noise and motor

circulating current. It was also designed for integrated safety control using Allen-Bradley® GuardLogix® controllers with safe speed monitoring and safety gates.

The upgrade included new motors and eight new Allen-Bradley PowerFlex® drives for the tissue machine line. The Active Front End (AFE) capability provided regenerative braking for energy savings as well providing harmonic mitigation for all the common bus line drives. By placing two AFE's in parallel, the DC bus capacity reached 2,470 Amps, providing power for all the tissue machine's common bus drive system.

Hassle-Free Commissioning

The Global Solutions team from Rockwell Automation has numerous software standards that have been developed over the years to help reduce risk by providing the capability for these machines to be configured correctly the first time.

For Kawerau plant, the entire solution was engineered, manufactured and delivered from the Lane Cove Assembly Centre in Sydney, Australia. To keep downtime to a minimum during commissioning, a full factory acceptance test (FAT) was conducted to test the equipment before installation.

"These machines are not designed to stop, and the process does not allow for it in terms of our supply channel, so time is always a limitation. We had to keep downtime to a minimum and took advantage of the two-week shutdown to complete some additional work at the site," said Paul Kirsopp, project manager, Asaleo Care. "The cooperative approach by everyone involved in the project allowed for ahead of schedule delivery despite the challenges of working alongside two other major upgrades at the plant."

Future-Proofing the Factory Floor

As a result of the upgrade, diagnostic information is more readily available and the level of support to access, repair and maintain the system is improved. The aged machines are more reliable and have advanced capabilities for guarding and productivity gains.

The project was more than just delivering new systems and technologies to the plant. With specific experience in tissue machines and paper machines, the Global Solution team provided the Kawerau plant the insights and in depth knowledge of the machines and equipment.

The system in the plant now does not require an enormous amount of technical input, and with improved reliability as the primary outcome, the productivity will improve when they start increasing the speed. "In addition, the machine is so much quieter that we had to check that it was still running at times," said Kirsopp.

Another Safety Leader

The productivity of people, machines and processes is not the only key element of any sustainable business; studies show that best-in-class OEMs achieve higher overall equipment effectiveness (OEE) when they see safety as important as productivity.

There is another industrial giant in Australia that has also gained successful outcomes from their plant and system upgrades.

Fairfax, one of the largest media companies in Australia and New Zealand, owns their original printing press in Tamworth, New South Wales since 1997. The press was constructed from second-hand equipment and was around 25 to 30 years old.

Since the media industry requires companies to invest in new technologies and consolidate print centers to service a broader geographical location, Fairfax decided to reconstruct and transform their Tamworth press into a new greenfield facility.

Tamworth press print center publishes 15 to 20 tons of newsprint every week. On top of that, there are other additional

printing operations. To continue to meet these production requirements while putting safety first, Fairfax conducted a risk assessment with participation from Goss International and Rockwell Automation.

Integrated Control and Safety

Based on the findings of the risk assessment, an innovative safety solution was commissioned at the site. This culminated in a positive safety record for the press that is based on the latest technologies in integrated control and safety.

Key to the success of the project was the requirement for a completely integrated solution that would provide effective safety, drive and process control for the Tamworth press.

GuardLogix safety controllers were the ideal choice and one of the major components of the solution. The control and drive system were configured so that some particular safety guards could not be opened until the press reached a slow speed, while opening a unit guard at the inappropriate time would stop the press to help prevent injuries.

The solution also included DeviceNet™, which provided communications between the Safety IO and GuardLogix to deliver integrated safety, drive and process control;



The upgrade included new motors and eight new Allen-Bradley PowerFlex drives for the tissue machine line

four PowerFlex DC drives were used to power the press that were linked back to the control system using ControlNet™ communications. There were more than 110 Sipa™ sensors that were put on the guards throughout the press. Moreover, the PanelView™ graphic terminals were used to display real-time status of the guards for fast

troubleshooting.

Safe Guarded Record

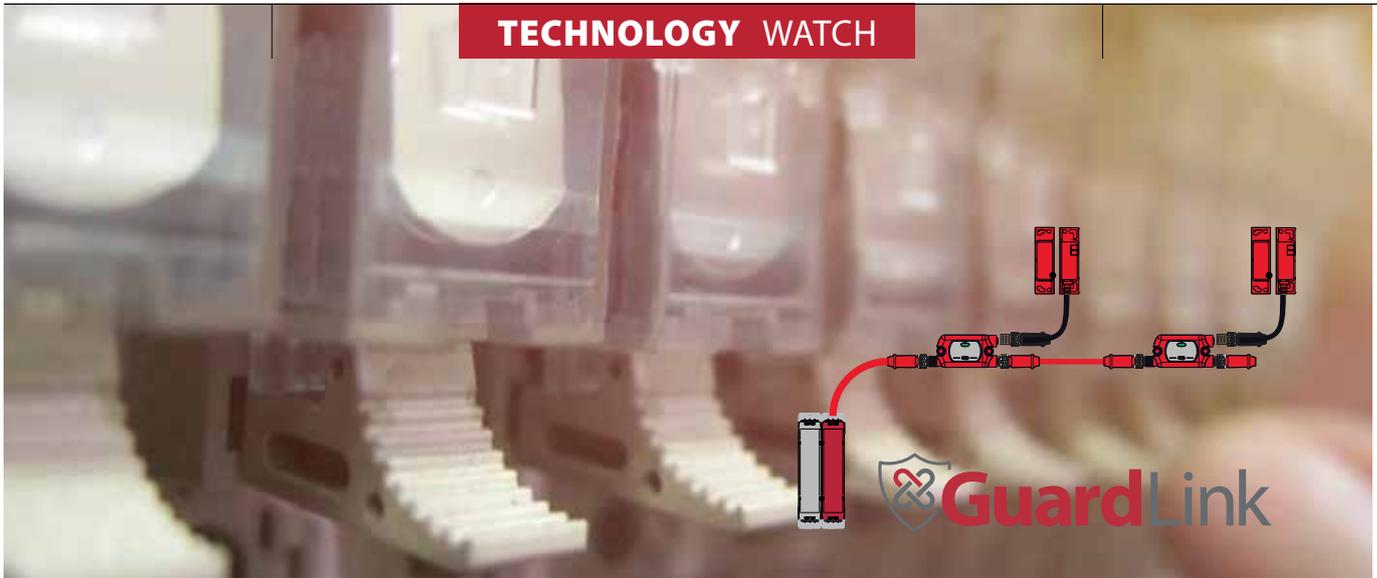
The press contains six print towers, six reel stands with two folders that create the end newspapers. This print line can either be run as one press or two independent presses (each containing three print towers with a folder). To allow for this, they introduced zoning into the safety system so that when used as one press, all of the press's safe stops are active; but if they run as two separate presses, the safe stop of one press does not control the other.

Although there is also an emergency stop that can make an overall stoppage, and there are more than 150 guards just on the press alone, to keep fingers out and avoid serious injuries, guarding can be cumbersome and cause issues with maintenance and production.

"With the new solution, there has been no hold up in production or maintenance schedules and it provides the safety and work environment for staff that we wanted to achieve," said David Hedges, plant manager at Tamworth Press.

In addition, Fairfax has found the working components offer great reliability, and the press operators have implemented a monthly check list to confirm all the guards are working correctly.

Since the installation of the press there have been no failures on the guard switches and there have been no injuries or near misses thanks to the high level guarding at the press. This is reflected in the press's safety record – up to 2,369 days without lost time injury, which is the best in the group. **ATI**



Ready to Simplify Machine Safety?

A truly connected enterprise has real-time control and information available across platforms and devices within the organization

●●● The Connected Enterprise – underpinned by the Industrial Internet of Things (IIoT) – gives users the ability to access the right information, in the right format at the right time.

A maintenance engineer with a tablet can exploit position beacons along a line or machine to interrogate specific safety equipment in precise locations, receiving the data when approaching each area dynamically without having to request it manually.

The same is true for an operations manager, who would use the same software on the same tablet and the same location beacons, but receive information applicable to their credentials. Using these core tools and technologies helps give contextualized information to the individual's need, based on their function or job.

With an information-enabled connection to machines and equipment, manufacturers get a much more comprehensive view of their operations.

Information-rich Connection

The EtherNet/IP™ network provides plant-wide network systems using open, industry-standard networking technologies. It offers real-time control and information when connecting high-end input devices such as motor starters and sensors to

controllers and human machine interfaces (HMIs) into the wider enterprise.

In situations where EtherNet/IP capability is not on the devices – especially those simple safety input devices and components such as emergency-stops, interlock switches, and basic guard locking switches, manufacturers can now exploit newer intelligent device-level linking technology – GuardLink® protocol from Rockwell Automation, that can feed individual device information back to a host controller.

GuardLink is a safety-based communications protocol utilizing standard cabling in a trunk and drop topology with plug-and-play connections. It significantly reduces wiring, while providing device location and delivering diagnostics, remote reset and lock commands over a single cable, and from there it provides the information to the system over the network. There is no configuration required and as many as 32 devices can be connected up to a maximum of 1,000 m (max. 30 m between devices).

Enhanced Interconnectivity

Traditional safety solutions commonly are hard-wired in series. Therefore in operation the user may lose the ability to distinguish the demands of individual devices; and if a

component fails, the user is only aware that a component somewhere on the series connection has issues.

Individual connections to each individual component require significantly more wiring and introduces many more potential fault points that can lead to unnecessary unplanned downtime. This also increases costs for machine builders.

On the other hand, GuardLink allows machine builders and end users to keep the series connection of devices but still get granular diagnostics from each one. Smart safety components featuring GuardLink linking technology allow users to access status information, improving the functional operation of the machinery.

For example, safety relays check and monitor a safety system and either allow the machine to start or execute commands to stop the machine or control safety-related functions. A GuardLink-enabled relay can achieve most of the functions safety systems require. It can also help simplify purchasing and parts management because it has an add-on profile for the Studio 5000 Logix Designer® engineering environment that provides access to the relay and GuardLink device data. It is designed to meet functional safety standards, such as ISO 13849-1 or IEC 62061, and it offers key functions to help ease

installation and system complexity.

A GuardLink-enabled connection tap, (also called smart tap) acts as adaptor for safety input devices – including both output signal switching device (OSSD) and electro-mechanical safety switch (EMSS) inputs – to connect to the GuardLink system while providing device location, status and auxiliary to the Guardmaster® safety relay. And when connecting all the safety devices through the connection tap and standard four-conductor cabling to a safety relay, this delivers visibility of system status down to individual guard doors and e-stops.

real-time diagnostics, but also allows manufacturers to understand and improve production processes.

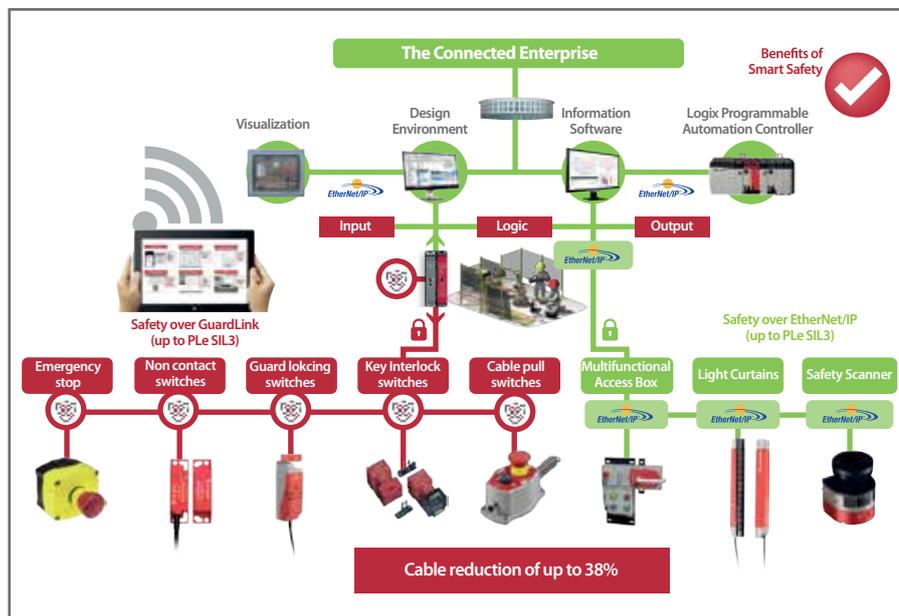
Get Control of the Data

Reducing the number and duration of interactions with a machine will make it safer and more productive. A well-designed system using a smart safety controller connected to the HMIs should keep fault finding tasks to a minimum.

Modern, comprehensive safety systems are able to conduct self-checking so that a series of faults do not accumulate, leading to the loss of the safety function and possibly

and support smart manufacturing and operations will need these elements for industrial manufacturing safety requirements:

- **The right products:** New smart-safety designs and devices can reduce wiring, design costs, and unscheduled downtime. And a comprehensive and scalable machine safety portfolio can help companies create safer and more productive machines.
- **The right tools:** Integrated systematic design tools and design environment with more features and functionally can help engineers keep up with the constant uphill market demands for increased overall productivity and safety for their entire automation system.
- **The right people:** Complying with safety standards to reduce the risk of injuries and improve productivity require the support and expertise of people who understand both automation and safety. When collaborating with them, manufacturers can deliver staff training and education on safety requirements and compliance and help secure a better and safer working environment.



Smart safety can be extended and improved by devices featuring Guardlink Technology

How it Works

If an e-stop or an interlock switch is operated, that individual safety signal will be sent to the safety relays. The relays are optically linked to each other, requiring no wiring for communication between them. That information is then communicated seamlessly across The Connected Enterprise by way of the EtherNet/IP network interface used by the Guardmaster safety relay.

Locally, the operators receive a notification that there is a fault and will know exactly where it is located instead of having to manually investigate all devices on a machine or line. This allows them to correct the issue themselves in the event a minor issue is shown or contact maintenance personnel for more serious faults. Ultimately, GuardLink not only minimizes downtime by communicating

additional hazards. Accidents are often the result of a chain of smaller incidents, such as unnoticed component failures or bypasses, rather than a single large failure. By using a safety programmable logic controller (PLC), it is possible to integrate the process and the safety logic.

Rockwell Automation has developed the scalable safety solutions incorporating smart safety devices that enable manufacturers and safety professionals to transform the way they monitor and manage safety. With the GuardLink system and the EtherNet/IP acting as a bridge of communication, manufacturers can build machines with greater visibility and the ability to more effectively manage massive amounts of complex data.

The Three Pillars

Machine builders that want to enable

Safe Machine, Safe Technology

Developments in global safety standards and technologies have made manufacturing safety a powerful tool to help optimize production. The contemporary technologies help improve worker safety and simplify programming and start-up.

The GuardLink safety system delivers multiple benefits, not just in terms of lowering engineering and design demands, but also in terms of its data capabilities and return on investment.

Indeed, best-in-class companies recognize that the deployment of an intelligent, integrated safety solution can not only help ensure the safety of their employees, but also directly affect their bottom line by improving manufacturing productivity.

The time is now for manufacturers to take advantage of the changing landscape in technology, not only from the safety system perspective, but also from a networking capabilities perspective. **ATI**

Smart Sensor for Smart Factory

A new wave of smart sensing technology is bringing deep insight into the health of industrial machines

●●● Data is the essence of manufacturing. Operations that take better advantage of data can create efficiencies that drive a more profitable production line.

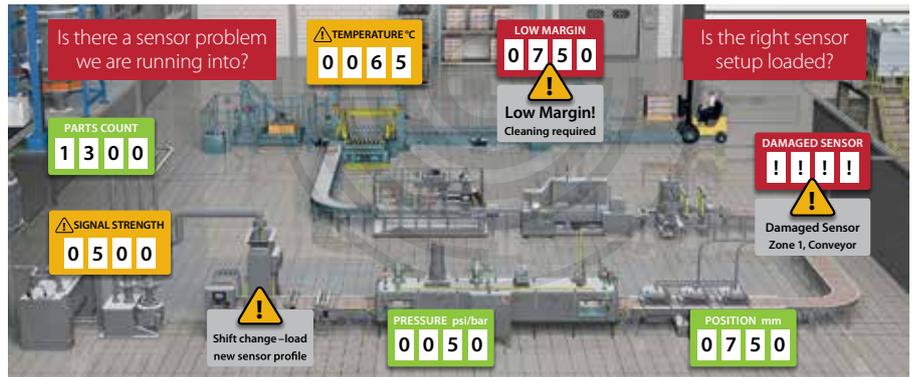
Making the transition to a smarter and more connected factory does not have to be complicated. Machines have had different types of sensors on them for years, and the main job of those sensors is to help manufacturers run the work smoothly.

However, they can do more than that. Adopting more sophisticated “smart” sensors that can deliver more detailed data offers growing opportunities for more efficient operations and for quicker-to-market capabilities.

Behave in a Smart Manner

Smart sensors are a way to future-proof machines. They are enabled with IO-Link technology, which empowers the sensor to communicate more data, allowing machines to operate more effectively.

IO-Link is a worldwide open-standard protocol that provides a standard interface for machine automation environments. The IO-Link masters are gateways that allow IO-Link devices to connect to other networks on the machine — such as EtherNet/IP™ — that share the information with the control system, bringing a wealth of detailed, machine-health diagnostics to operators and maintenance personnel.



With Smart Sensors available for every possible parameter – from pressure to temperature, motion to distance, level to flow and many more.

In fact, standard sensors are limited to indicating the presence and/or absence of an object, while smart sensors can provide up to 32 bytes of cyclical data including diagnostics not only for the sensor but about the application environment.

Also, smart sensors offer other advanced functions that make setup, maintenance and troubleshooting much more efficient, including the storage of multiple machine profiles to simplify parameter adjustments during line and shift changes as well as automatic device replacement, which feeds previous sensor configurations directly to new sensors as they are replaced.

Sensor Applications for Smart Operations

Smart sensing technology is fulfilling this need, bringing deeper insight into

the health of industrial machines to help current — and future — generations of operators optimize plant processes. Take a look at some of the common application scenarios of how smart sensors help merging disparate data into streams of actionable information and allow assets to be monitored and optimized from anywhere in real-time.

Smart Commissioning

After a new machine is installed into an existing production line, the new machine with pre-installed smart sensors requires commissioning. During machine commissioning, the operator accesses all relevant sensor data with FactoryTalk® software from Rockwell Automation on a mobile device. The operator identifies that sensor on a channel needs a set point adjustment.

In the software sub-menu, the operator is able to change that set point value instantly. Having the change of setpoint value, they can see the sensor dashboard adjusting to the required set point and that no further alerts are shown.

Smart sensor solutions allow continual smart monitoring of sensor signal and offer the ability to make fast readjustment. This can provide actionable data to help maximize overall equipment effectiveness (OEE) and mean time between failure (MTBF).

Smart Replacement

The smart sensor automatic device configuration function can help minimize installation and increase equipment uptime.

For example, when a sensor is damaged on the packaging line, a maintenance person receives a warning on a mobile device that there is a sensor failure and the exact location of the issue. Application specific naming information (ASN) guides him directly to the fault, with eBOM providing device vendor data and part

Knowledge of current sensor situation and status ensures timely identification of any type of potential sensor issue.

number for fast replacement.

After physical installation of the new smart sensor, the automatic device configuration function downloads all sensor parameters to the new sensor in milliseconds. The warning alarm on the mobile device will be reset, allowing production to continue uninterrupted.

Smart Tracking and Tracing

A range of smart sensors can be used for production tracking and historical trace requirements. When a high-speed code reader captures the barcode or 2D code data, item level identification is connected to a Logix controller over the EtherNet/IP network. Tracking and identifying packed products takes place with real-time data processed in FactoryTalk ProductionCentre® software suite to maximize production efficiency.

Since all smart sensors can be integrated into Studio 5000® software, the products and raw materials are tracked at every stage, from manufacture to dispatch and beyond, in one single engineering environment.

Production Optimization

In most flexible manufacturing applications, there are numerous sensors that require re-teaching. And many times, the configuration methodology for the sensors differs from one sensor family to another.

As a result, there is heightened responsibility on the operator to recognize

the exact process required to update all the sensors. It could take as long as an hour to manually reconfigure the sensors on a single machine. In addition to the hourly rate required to complete the reconfiguration, the loss in production time for that one hour could bring a greater cost.

With smart sensors, those operations that involve frequent line changes with different-sized products can be streamlined. Rather than requiring manual reconfiguration for each product coming down the line, smart sensors can store multiple profiles in the controller that can then be pushed down to the sensor as needed to support the various products.

The data that is being retrieved can also be used to improve the manufacturing operation. Improvements in technology and broadband capabilities mean faster processing of large amounts of disparate data that can be used to analyze production and improve efficiencies over time.

The Eyes and Ears of Machines

Unless machine operators can aware what is happening on machines installed in factories minute-by-minute, it is impossible to maintain optimum productivity and efficiency at all times, or to avoid unplanned downtime and loss of production.

Whereas sensors historically communicated just one message - provide only a limited amount of information, but lack the capability to offer diagnostic or parameter data to exchange with a controller, the modern , smart sensor performs that basic task while also providing real-time updates on its own performance, analysis of its own condition, and projection of its own lifespan. This information enables predictive maintenance, rather than reactive one.

Likewise, an integrated smart sensor solution further provides the data required to create a comprehensive picture of the status of the operation process as well as an enterprise at any particular moment.

As the essential components of The Connected Enterprise, smart sensors can also facilitate the introduction and operation of smart machines, for even greater efficiency and productivity. **AI**



Automatic Device Configuration helps minimize downtime



Smart sensors and mobility optimize preventative maintenance and troubleshooting



Continual smart monitoring of wide range of values in FactoryTalk Software

Hardwired or add-on safeguards can lead to longer machine design times and lower operational productivity. To address these challenges, Rockwell Automation has enhanced its machine safety portfolio to include a full range of input, logic and output devices designed to help companies more easily make safety a core function of smart machines.

Safety Controller Enables Faster System Performance

●●● The new Allen-Bradley® GuardLogix® 5580 and Compact GuardLogix 5380 controllers expand the Integrated Architecture® portfolio by bringing safety into the latest generation of the Logix 5000™ series controllers.

They provide faster system performance and new options for meeting SIL 2/PLd safety requirements or higher. These can help machine designers simplify their architecture and reduce control chassis footprint by scaling machines to the specific required safety rating, rather than using a controller designed only for higher ratings.



Compact GuardLogix 5380

GuardLogix 5580

Linking Safety to The Connected Enterprise

●●● The Allen-Bradley Guardmaster® Dual GuardLink™ (DG) Safety Relay is a new multi-functional safety relay, which provides up to 20 configurable safety functions with an optional time delay of the relay outputs.

To help minimize downtime and increase productivity, the relay features a built-in diagnostic function that can be used with the 440R-ENETR Ethernet/IP™ gateway or integrated add on profile (AOP) for Studio 5000 Logix Designer® software.

The Guardmaster GuardLink enabled connection tap connects an output signal switching device or electro-mechanical safety switch inputs — including guardlocking switches, non-contact switches, light curtains, limit switches, e-stops and key interlocks to a GuardLink system.



As part of the Rockwell Automation Integrated Architecture system, the Guardmaster EtherNet/IP Network Interface provides comprehensive real-time terminal-level diagnostics such as cross faults and over currents, making it simple to troubleshoot manufacturing applications.

Servo Drive with Advanced Safety

●●● The Kinetix® 5700 servo drive includes five safe-stop functions and three safe-speed monitoring functions to help create smarter and more productive machines. These functions allow a machine to remain active while simultaneously being safely monitored.

With integrated safety on EtherNet/IP, the Kinetix 5700 servo drive mitigates the need to separately wire the drive for safety. It reduces overall system wiring, saves time and money in installation and helps remove potential points of failure, thus resulting in less down time and troubleshooting.



New Soft Starter Designed for Customer Flexibility

- As an extension of the soft starter family, the **Allen-Bradley SMC™-50 smart motor controllers** deliver greater functionality and efficiency across industries.

Users will have the option of choosing the proper power structure for their application with the SMC-50 smart motor controller. For operations that run over an extended period, built-in internal bypass allows users to shift from solid-state switches to bypass contactors. By switching over to the bypass circuit, users can save on energy and decrease operational costs by minimizing excess heat buildup.

With 17 start and stop modes and four special operating modes, the soft starters have an advanced application scalability such as normal and heavy-duty ratings, expandable I/O and sensor capability and network integration capabilities. Also, they provide access to several communication modules, including EtherNet/IP and DeviceNet™ networks. Combined with a microprocessor platform, such connectivity brings energy-monitoring capabilities and protection features that make applications easier to troubleshoot and fix.



Module Offers In-chassis Computing Capability

- The **Allen-Bradley ControlLogix® Compute module** offers the flexibility to create custom applications within the Windows 10 IoT Enterprise or Linux operating systems as well as using off-the-shelf applications to enhance their automation systems. As a result, users can combine Windows applications as close to the point of decision-making as possible.



The module offers a full range of digital, diagnostic digital, analog, motion control, specialty I/O, and compute modules to meet different application needs. Users can use any of the chassis-based modules in the local chassis of a ControlLogix controller or in a chassis linked to a ControlLogix controller across ControlNet™ or EtherNet/IP networks.

Other features of the module include providing high-speed access to the ControlLogix controller over the backplane and allowing direct connection to a high-definition VersaView® industrial monitor.

Latest Software Release for Productive Programming

- With the newly enhanced **Studio 5000 Automation Engineering & Design Environment® software**, engineers can more quickly design, build and commission automation systems. A new user interface is included across all Studio 5000 applications, helping users improve productivity from design to deployment. Other new features of the updated applications are:

- **Studio 5000 Logix Designer** : Includes a new Logix tag-based alarm functionality, updates to several programming languages and a modernized structured text editor to help optimize design time
- **Studio 5000 View Designer®** : Includes data logging and trending for easier troubleshooting
- **Studio 5000 Architect®** : Supports system-wide capabilities that can reduce design complexity and time
- **Studio 5000® Logix Emulate™** : Includes an updated interface for connectivity to operator training systems
- **Studio 5000 Application Code Manager** : Allows free download of the application's lite version, Machine Builder Library and Process Object Library

A Centralized Asset Management tool

- Plant managers can now use the updated **FactoryTalk® AssetCentre v8.00 software** to automate discovery and track the status of devices, network switches, and software on workstation computers across an entire facility.

The software's base server functions streamline life-cycle management and help decrease unplanned downtime. Other base functions with updates include, but is not limited to:

- **Improved Import/Export Utility** : Improving the speed and control functions for users to create, configure, up/download assets within the software
- **New Compare Options** : Allowing users to select a custom external compare utility using the Generic FTP asset
- **Mobile Web Client** : Enabling access via platform spanning across iOS, Android, Windows on a device of user's choice from a smart phone or tablet

The scalable design of FactoryTalk AssetCentre allows for easy expansion of assets and extensible (add-on) capabilities – it's adaptable from small applications to plant-wide systems. Add-on options such as disaster recovery, process device configuration and calibration management help the system grow as the business goals and production needs change.



Demanding Applications Need Smart Sensors

●●● Enabled with IO-Link technology, **Allen-Bradley® 871FM miniature metal flat pack inductive proximity sensors** deliver more comprehensive diagnostic and parameter data to the controller over EtherNet/IP from the IO-Link master module. This capability helps minimize downtime and increase productivity.

They are available in welding models with sensing range up to 10 mm and Factor-1 equal sensing for different ferrous and nonferrous metals. Weld-immune models are equipped with an Allen-Bradley ToughCoat Finish™ coating to help prevent weld-slag buildup, making them ideal for extreme environments, particularly in automotive welding applications.



They are also well-suited for food and beverage processing plants, stamping, material handling and a wide variety of other sensing applications. The miniature flat pack sensors' features include:

- Stainless steel housing with stainless steel face provides a rugged solution in harsh environments
- Compact, rectangular sizes ideal for space critical applications: 20 x 32 x 8 mm / 30 x 52 x 14 mm
- Sensing range from 7 to 10 mm
- Enclosure ratings IP69K for general purpose model and IP67 for welding model

The All-new Controller and Configuration Software

●●● The **Micro870™ programmable logic controller** is a newest addition to the Micro800™ family. It offers machine builders and end users a higher level of scalability, flexibility and customization.

Designed for large standalone machine applications, the Micro870 controller comes with great memory capacity – a double of Micro850® controller - to enable more modular program and use of user-defined function blocks. The embedded motion capabilities support up to two axes of motion with TouchProbe instruction that registers the position of an axis more precisely than using interrupts. Furthermore, it is capable of communicating on various networks and with devices through EtherNet/IP™, Serial, and USB ports.

Programming the Micro870 controller is simple with the latest **Release 11.00 for Connected Components Workbench™ software**, which feature a look and user experience that closely resembles Studio 5000 Logix Designer® software.

It provides controller programming, device configuration and data sharing with the human machine interface (HMI) editor for PanelView™ 800 graphic terminals. Users who are familiar with Studio 5000 will find it easy to use Connected Components Workbench software r11.00 to program their Micro800 controllers for their standalone machines. Their programming time can be shortened substantially as the software's new code-sharing feature allows users to copy and paste ladder codes and instruction sets from RSLogix 500® and Studio 5000 to the Connected Components Workbench software.



A Right-sized Visualization Solution for Smaller Applications

●●● The new **Allen-Bradley PanelView 5310 family of graphic terminals** brings the benefits of greater integration between the HMI and controller to both large and small applications.

The PanelView 5310 graphic terminals deliver the same usability benefits and enhanced integration with Logix 5000 controllers as the PanelView 5500 terminals. But the new terminals are specifically designed for applications of up to 50 HMI screens. The terminals are available in 6, 7, 9 and 12-inch display sizes.

Companies can also use the enhanced integration to create high-speed jog buttons in place of cumbersome hardwired buttons. These auto-diagnosing buttons can interact with the controller at I/O speeds to help reduce downtime and improve productivity. Other benefits of the PanelView 5310 graphic

terminals include:

- The intuitive Studio 5000 design environment allows users to create reusable faceplates, screens and custom graphics to help reduce development time
- Emulation capabilities allow engineers to test run projects in the development environment.
- VNC connectivity allows operators to remotely monitor operations via a smartphone, tablet or personal computer.
- Historical-trending and data-logging features allow operators to easily troubleshoot issues directly on the panel.



A Better Access to Production Information

●●● The updated **ThinManager® v10.0 software platform** provides new visualization, mobility and security features, helping machine operators and technicians produce more with less downtime.

With a new virtual-screening capability, users can customize how they see applications and data from multiple sources, all without rewriting a single line of code. This capability can help

them view the information that is most relevant to their job.

The updated version introduces authentication pass-through to help improve productivity. Now the software can natively pass users' credentials to supported HMI products like FactoryTalk View Site Edition.

Moreover, with its built-in mobility solution, Relevance® software technology, the platform can deliver supported software components directly to mobile devices at specific locations within a facility. Relevance uses location resolvers such as Bluetooth beacons and Wi-Fi so mobile users and devices can only receive content in authorized areas. This capability can help users achieve greater connectivity with better operational security.

Updated HMI Software Boosts Operator Efficiency

●●● New features in the FactoryTalk View HMI software version 10.0 include greater access to information, new mobile device support and better cross-software integration to improve productivity.

Operators can now use the TrendPro tool in FactoryTalk View Site Edition (SE) software to overlay alarm information on trend data. This feature can help them connect alarm occurrences with data-point values to speed up troubleshooting and use the tool to save and share ad hoc trends with other workers. The updated version also adds support in the HMI for flexible alarming with the Allen-Bradley Logix line of controllers.

Moreover, **FactoryTalk View SE v10.0** integrates the

ThinManager software login into the FactoryTalk View platform. In the past, users had to separately log in to both systems. Now, they can bypass the second security point with an automatic login pass-through for faster operations.



The updated **FactoryTalk ViewPoint software**, which extends the FactoryTalk View SE software to mobile devices, now supports recipe management. And with ViewPoint v10.0 software, FactoryTalk Alarms and Events alarm history is also available on their mobile devices.

The **FactoryTalk View Machine Edition (ME) software v10.0** adds design-time and run-time enhancements to improve user efficiency and productivity. The HMI software now better supports restoring and upgrading legacy projects and improves usability when editing displays.

OPC Connectivity to FactoryTalk Platform Available

●●● The newly released **FactoryTalk Linx software v6.00** is scalable from a single computer to large, high-volume distributed systems that share the common FactoryTalk Services Platform. It also provides data-server redundancy to maintain communications when a computer or network failure occurs.

FactoryTalk Linx Gateway provides OPC Data Access (DA) and United Architecture (UA) connectivity to FactoryTalk Live Data for 3rd Party OPC Clients to access control system information from the Rockwell Automation Integrated Architecture. It now enables better OPC UA Client and Server communications.

Other than the upgrades of FactoryTalk Service Platform (v3.0) and FactoryTalk Activation (v4.02), this software updates include adding anomaly correction function, granting software access to CIP Energy™ data and FactoryTalk View SE access to Logix Tag Based alarm members, incorporating new hardware electronic data sheets (EDS) files and more.

Software Improves Visibility of Factory Network

●●● **FactoryTalk® Network Manager™** is a plug-and-play software that help plant floor personnel manage all network product such as switches, routers and security appliances.

The software provides increased visibility and insight into performance of the network from the perspective of network

devices. It automatically discovers assets, their associated IP address and then creates a topology view of those connected devices all in one place.

The software identifies plant floor assets by leveraging SNMP and SIP protocols and other common communication protocols for inventory discovery. Within the inventory, users can see detailed information about the managed switches. Also, it is able to capture switch level alarms and events in real time to help minimize troubleshooting. User can have the ability to track the precise cause of network downtime without the need to check the entire network to figure out which node is causing an issue.

LISTEN.
THINK.
SOLVE.®

Reduce time to market



Our control and information technologies and expertise help you to combine production velocity with precision delivery, meaning you can get ahead of the competition. And stay there.

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