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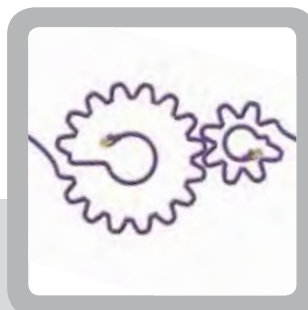
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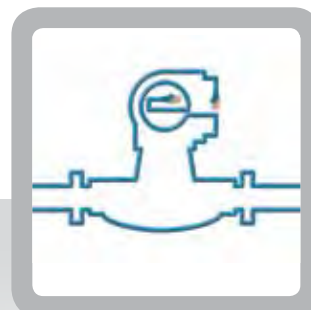
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I.T. Integration

Automation and Safety Control

High-speed Synchronised Motion Control

Process Device Integration

Rockwell Automation

EDITORIAL

Automation Flexibility Resides in Right-Sized Offerings

Traditionally, system designers have had to implement control systems developed for a specific-sized automation architecture. They have used multiple control platforms as well as networking architectures to build their solutions.

Bob Ruff

An innovative approach from Rockwell Automation® changes this paradigm: It enables you to use common automation products and tools to scale a solution for your process, batch, discrete, safety, drives, motion and energy applications, regardless of size or complexity.

Built on the Rockwell Automation Integrated Architecture™, it offers you the flexibility to find the best fit for applications through a range of controllers, I/O, visualization, motion, drives, safety and information offerings. From components to our Midrange Architecture System to our Large Advanced Architecture System, we provide the scalability that helps reduce total ownership costs. Scalability also helps you minimize your investments in learning and deployment, so that you can quickly make changes to machines and processes to react to market trends.

Our enhanced Midrange Architecture System, featured in this issue of *Automation Today Asia Pacific*, provides you with increased processing power, advanced motion capabilities, EtherNet/IP™ networking and seamless scalability within the range of programmable automation controllers (PACs). In addition, by using the same common development environment and programming language, you can migrate within and between solutions, which offers savings in time, engineering effort, commissioning and training.

With Integrated CIP Motion now available on the Midrange CompactLogix™ PACs, users can also develop advanced motion solutions covering anything from as low as two axes up to 16 axes. Coupled to the new Allen-Bradley® Kinetix® 350 Servo Drive, users have access to a solution more suited to stand-alone applications with low axes counts.

Rockwell Automation also has developed Ethernet switching technology designed for Midrange applications. Our Stratix 5700™ industrial Ethernet managed switch with Cisco® technology, along with configuration and monitoring tools, provides secure integration to the enterprise network and allows setup and diagnostics from our Integrated Architecture.

In this issue, you will also find information on how to strike a balance between information access and security. A successful industrial control system security strategy includes best-practice security policies and advanced technologies that help reduce risk and protect manufacturing assets.

Our Integrated Architecture system helps you build a business where information flows across your organization. We invite you to contact Rockwell Automation to discover how our right-sized solutions can help you address productivity, globalization, innovation and sustainability.

Bob Ruff

Bob Ruff, *President*
Rockwell Automation, Asia Pacific Region

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Rockwell Automation

NEWS & EVENTS

Rockwell Automation to Acquire Medium-Voltage Drives Business of Harbin Jiuzhou Electric Co. Ltd.

Rockwell Automation® has completed the acquisition of the medium-voltage drives business of Harbin Jiuzhou Electric Co. Ltd., based in Northeast China. The purchase price is RMB 530 million (approximately US$83 million).

The acquisition strengthens Rockwell Automation's presence in the Asia Pacific motor control market by adding significant capabilities in design, engineering and manufacturing of medium-voltage drive products. It also provides access to grid-tie inverter technology. Jiuzhou has successfully served as a Rockwell Automation contract manufacturer for seven years, in addition to maintaining its own well-established customer base.

Asia Pacific Beverage Customers Attend Advanced Automation Technologies Forum

Rockwell Automation® recently hosted its first Advanced Automation Technologies for Beverage Lines forum in Bangkok, Thailand. The event coincided with Propak (Process and Packaging) Show-Asia and attracted plant managers, plant operations staff and key decision-makers.

The goal of the event was to help end users understand the Rockwell Automation ability to meet increasing requirements for beverage lines. Heightened beverage demand in the region is pushing end users to become more efficient and OEMs to build machines that help end users reach this goal.

Together with OEMs Tridentpack and Zi-Argus, Rockwell Automation domain experts presented line balancing solutions and provided a demonstration of simulation tools, explaining how end users could achieve faster speeds and greater precision using this technology. Based on the success of this event, plans are under way to implement workshops throughout Asia Pacific, including stops in India, China and Korea.

Lauren-Jyoti Awards US$1.9 Million Order to Rockwell Automation

Lauren-Jyoti, a joint venture between Lauren Engineers & Constructors, a U.S. engineering, procurement and construction company, and Jyoti Power Structures, an engineering firm in India, has awarded a US$1.9 million order to Rockwell Automation® and its Global Solutions team. Rockwell Automation will provide a PlantPAx™ distributed control system (DCS) with solar field local controller panels for Godawari Green Energy in Rajasthan, India.

Lauren-Jyoti will construct a 50-megawatt concentrated green field solar power plant for Godawari Green Energy that will be one of the first utility-scale solar thermal power plants commissioned in India. Rockwell Automation won the order for its ability to deliver a complete scalable automation solution that includes DCS process control, mirror controllers and motor controls.

APBC Wins Award

The Singapore Ministry of Manpower and Workplace Safety and Health Council recently recognised the Rockwell Automation® Asia Pacific Business Center (APBC) with its Excellence Award during the Workplace Safety and Health (WSH) Awards ceremony. This is the second year in a row it received this honor.

The recognition puts the APBC among the region's most elite companies in terms of safety and health performance. Prior to this recognition, the APBC was the recipient of the Gold Award for three consecutive years.

PartnerNetwork Program Adds Industry-Leading Companies

The Rockwell Automation® PartnerNetwork™ framework – consisting of the Encompass™ Partner Program, OEM Partner Program and Solution Partner Program – offers global manufacturers access to a collaborative network of companies mutually focused on developing, implementing and supporting best-in-breed solutions to achieve plant-wide optimisation, improve machine performance and meet sustainability objectives.

Rockwell Automation announces that two new product suppliers in the Americas region have joined the Rockwell Automation Encompass third-party product referencing program, **eRPortal Software Group LLC** and **Schweitzer Engineering Laboratories Inc.** Four new partners have joined the Rockwell Automation OEM Partner program including **Automatic Handling International**, **Bastian Solutions**, **BMH Robotics** and **IPG Photonics**. Two new systems integrators have joined the Solution Partner Program including **Prime Controls** and **Innovative Control Solutions**.

Rockwell Automation Reports Third Quarter 2012 Results

Rockwell Automation® reported fiscal 2012 third quarter sales of US$1,560.4 million, up 3 percent from US$1,516.2 million in the third quarter of fiscal 2011. Organic sales increased 7 percent, and currency translation reduced sales by 4 percentage points. Income from continuing operations was US$190.7 million (US$1.33 per share) compared to $US178.8 million (US$1.22 per share) last year. Earnings per share from continuing operations increased 9 percent.

Keith D. Nosbusch, chairman and chief executive officer, says, "It was a good quarter in the midst of a challenging macroeconomic environment."

Rockwell Automation Appoints Managing Director Australia and New Zealand

David Hegarty

Rockwell Automation has announced the recent appointment of David Hegarty as Managing Director Australia and New Zealand. David brings a wealth of sales and marketing experience to the role, and has a firm focus on customer service.

"Our vision is for Rockwell Automation to be the most valued supplier of industrial automation products and solutions in the region. I see my role as Managing Director, Australia and New Zealand as one of translating what being 'most valued' means to customers and industry in our region, and leading our team to meet and exceed customer expectations," said Hegarty.

Following his appointment on 5 November, Hegarty takes on a dual role. He will maintain his previous role of Regional Sales Director for the region, further strengthening the company's dedication to customers. "I'd like to make sure that everyone in Rockwell Automation feels that they play a part in serving customers and keep customer service central to what we do," said Hegarty.

Hegarty has been with Rockwell Automation since 1999, and is inspired by the high quality of the company's technology, products and people. He has managed branches in Sydney and Brisbane, and spent several years based in Singapore. This has given him a broad understanding of the capabilities of the company and strong links to leadership in Australia, New Zealand and Asia.

A key challenge will be to lead the company during a time of economic uncertainty in Europe and China, and manage the flow-on effect to our region. Hegarty believes that this opens up tremendous opportunities. "Many manufacturers and producers are moving their focus to productivity in Australia and New Zealand," he said. "As an industrial automation and information company Rockwell Automation has the opportunity to work with our customers to drive productivity in their businesses."

"I see increased productivity as our customers working existing assets harder and smarter to increase their output. By providing production information to the right person, at the right time, in the right context, and optimising existing process control, I think we can achieve this." AT

Rockwell Automation on Tour— hits the road in Australia from March to June

Making new tracks, Rockwell Automation on Tour will visit multiple locations in both metropolitan and regional centres around Australia. The free educational workshop series allows attendees from all industries to explore the latest aspects of the company's Integrated Architecture approach to plantwide control and information systems.

Each location will host a free one day event comprising concurrent streams of hands-on labs detailing the latest Rockwell Automation products and software, as well as an industry focussed discussion stream. Workshops are designed to cater for a range of interests, with introductory and advanced sessions staggered throughout the day, including:

- Advanced PLC programming disciplines
- Integrating safety and standard motor control
- Process control solutions with the Logix platform

- Information solutions software and HMI disciplines
- Migration tools and techniques

According to Matthew Treeby, Commercial Marketing Manager - South Pacific, Rockwell Automation, the program will include sessions that focus on solutions to key challenges faced by industry today: manufacturing and IT convergence, energy management, and industrial and machine safety. The event will also introduce participants to landmark new products being launched in 2013, including Micro 850 programmable controllers, PowerFlex 525 variable speed drives and Studio 5000 automation engineering & design environment software.

"These events are a fantastic opportunity to update your skills, gain knowledge from industry experts and discover how your peers are solving the same challenges you face", he remarked.

Rockwell Automation on Tour will be hosted throughout seven locations, from March to June. Keep an eye out for further information and registration details at www.RockwellAutomation.com.au.

Registration for Lab Sessions is essential as seating is limited.

Rockwell Automation on Tour event dates:

- 19 March - Sydney, NSW Rydges Parramatta
- 21 March - Newcastle, NSW Cypress Lakes Resort
- 9 April - Brisbane, QLD Brisbane Convention & Exhibition Centre
- 18 April - Darwin, NT Holiday Inn Esplanade
- 30 April - Adelaide, SA Hilton Adelaide
- 14 May - Perth, WA Duxton Hotel
- 4 June - Mackay, QLD Mackay Entertainment & Convention Centre AT

Rockwell Automation on the Move –
S³ your ticket to a more Safe, Secure and Sustainable plant

The ongoing economic recovery is challenged by rising commodity costs, supply chain disruptions, and persistent unemployment. Following the successful series of events held in Australia in 2012, Rockwell Automation on the Move will move on to New Zealand to bring industry a showcase of technology, products and services. If you plan to attend Rockwell Automation on the Move, you will see first-hand how Safe, Secure and Sustainable manufacturing practices can turn these marketplace challenges into advantages, especially during uncertain economic times.

The focus will be to demonstrate how safety technology, managing security risks and sustainable production, can be combined to provide an integrated, plantwide system to optimise business operations and leverage opportunities in the market place. Visitors will have the opportunity to see, hear and interact with industry experts, 'hands-on' labs and displays at venues in Auckland and Christchurch during March 2013.

Rockwell Automation on the Move will commence on 5 March, with a free two-day event at Alexandra Park, then moving to Christchurch at the Air Force Museum for a one day event on 13 March. The exhibition features a substantial product and services display area plus two additional hands-on labs and lecture rooms for presentations and interactive workshops.

"This is an exciting event, there is only one automation show of this size and calibre to come to New Zealand and we are looking forward to hosting this unique customer learning experience. With a mixture of hands on labs, interactive productivity enhancing seminars and the chance to network with industry leading technology specialists this is event should not be missed" explained Stephen Broadbent, Rockwell Automation New Zealand Sales Manager.

The exhibition also emphasises the importance of partnered solutions in the field of automation and process control by showcasing the latest product developments and technological direction from both Rockwell Automation and it's PartnerNetwork™.

In addition the event provides an ideal forum for information exchange. Industry professionals, manufacturers, OEMs, system integrators and third-party suppliers will have the opportunity to meet, network and leverage complementary skills and knowledge.

If industrial automation, process control and information technologies are important to your industry sector, you simply cannot afford to miss this essential event. Attendees will be offered free morning and afternoon tea, lunch and VIP parking at the venues. Full event details and Registration information is available at www.rockwellautomation.co.nz AT

Designing a Scalable Control System

The Midrange Architecture System from Rockwell Automation is built upon components that help users match their automation needs to their applications.
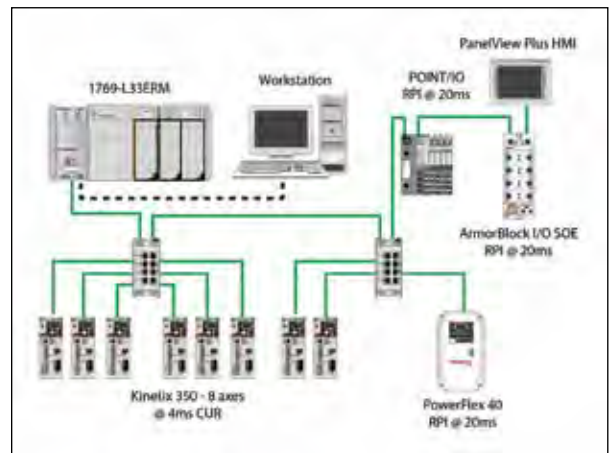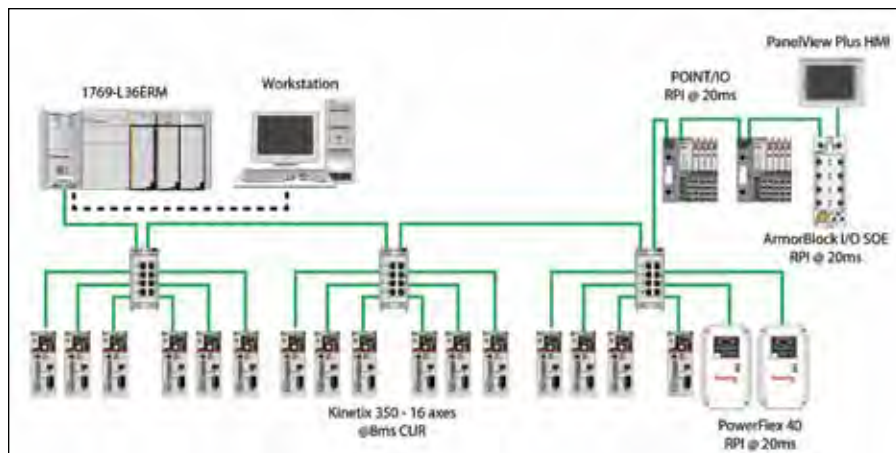
Multidiscipline control systems – managing high-performance integrated motion, process and safety control – have been around for years, helping users converge large-scale applications with a common control platform. Yet, original equipment manufacturers (OEMs) have traditionally used multiple control platforms and networking architectures to accommodate the range of applications and machine sizes within their portfolios. This has created unnecessary complexity, for both OEMs and end users, because each platform and network has a unique design environment, user interface and vendor support model.

Rockwell Automation® recently has extended its Integrated Architecture™ system with a full portfolio of EtherNet/IP™-enabled compact controllers, I/O, servo drives, visualisation and simplification tools that are suited for smaller applications. This scalability is especially powerful in the area of motion, as applications with up to 16 axes of motion can be designed using the same programming environment as operations with high-axes counts, such as complex packing and material-handling operations.

Network Convergence

The EtherNet/IP protocol plays an important role in the Rockwell Automation Midrange Architecture System: It helps OEMs and their end customers streamline information flow. Through EtherNet/IP connectivity – and features such as integrated motion, safety and standard control – OEMs can take advantage of a single network architecture for their machines.

This network convergence can help bring significant savings, especially for machines requiring high-speed motion control, as it removes the need for a separate motion network. The time synchronisation capability within EtherNet/IP provides high-precision motion control, distributing time reference across all nodes so the network does not have to be scheduled. In addition, network traffic is reduced because the size and content of data packages can be dynamically changed.

Furthermore, replacing a multi-tier networking strategy with one standard network architecture reduces engineering, commissioning and deployment time as well as integration risks.

Driving Smart Manufacturing

By implementing a scalable control approach, OEMs can better accommodate changing design parameters or expansion of their end customers' application needs. Also, OEMs can dedicate more engineering resources to drive machine innovation. Plus, if they motivate their customers to standardise on a single control and networking platform, OEMs can streamline support and maintenance efforts.

Because engineers would only need training on one platform, OEMs can provide more focused support while saving on overall training costs. With more engineers on staff that are fluent on a given control architecture, the consistency and quality of customer support also improves. In addition, standardising on a single control platform allows users to stock fewer parts while improving overall part availability.

The modularity and faster communication gained by using EtherNet/IP also helps reduce installation costs and the number of switches, connectors and modules in the network.

What's more, choosing a control system that connects and integrates easily to an end user's manufacturing network makes it easier to incorporate the machine into the end-user environment, leading to faster

commissioning and time to market. Once the system is installed, the single control platform and networking architecture help users converge machine-level data with business-level data for improved management and decision-making. This drives smart, safe, sustainable manufacturing.

Validating Capabilities

In recent system evaluations, the Rockwell Automation Midrange Motion System was validated up to 16 axes of Kinetix® 350 single-axis servo drives for both managed and unmanaged network switches using CompactLogix™ 5370 controllers. Network layouts focused on a switch-level star topology; however, device-level linear or ring topologies are also supported.

During the testing, various motion-centric metrics were captured and evaluated to verify that motion control would not be impacted by network traffic or switch selecting (managed vs. unmanaged). The metrics included, but are not limited to, position error (following error), phase error (registration input error) and offset to master.

In an attempt to simulate "real-world" network traffic, the motion system was exposed to non-motion traffic. The traffic patterns consisted of 20 percent multicast/80 percent unicast; packets were randomised up to 1,500 bytes.

A maximum of 80 percent bandwidth utilisation was injected into the network, and motion-related metrics were recorded into a series of histogram data collection arrays; the results were evaluated to determine if motion performance was impacted by network traffic. The maximum traffic (80 percent) represents a heavily loaded network that is typically beyond most real-world network loading situations.

Results for Isolated Network Topologies

The test validated the use of the Midrange Architecture System for executing both advanced motion logic and discrete I/O logic. Results for a system design using an isolated 16-axis star topology demonstrate that when tested up to 80 percent network bandwidth utilisation, using both managed and unmanaged switches, the system managed 16-position-configured axes with an 8 ms coarse update rate.

Continuous task was 750 rungs, and periodic task was 40 rungs/8 ms period. By entering the continuous task size, users can get an estimate of the execution time after the motion task, system task and periodic task have all executed. The size of the periodic task and the frequency of execution help determine how quickly the continuous task can be executed.

Additional results for system designs using isolated 8-axis star topology, isolated 4-axis star topology, and isolated 4-axis linear/ring topology can be found in the white paper entitled *Scalability – the Best Approach to Change*. The white paper covers topics including network topology, selection of managed and unmanaged switches, network loading, and Ethernet cabling recommendations.

The Rockwell Automation Midrange Architecture System provides OEMs with a single development environment and a fully integrated axis portfolio. OEMs are finding that this combination improves design flexibility and helps quickly scale the control system up, down or across applications to meet a range of automation requirements. **AT**

SOFTWARE CONFIGURES LOGIX-BASED AUTOMATION SYSTEMS

The Rockwell Automation Integrated Architecture™ Builder (IAB) is a tool that helps users select hardware and generate Bill of Material (BOM) for Logix-based controllers, I/O, networks, PowerFlex® drives, On-Machine™ cabling and wiring, motion control and other devices. It includes an Advanced Performance Calculator (APC) that can be used to assess network traffic; additional algorithms help determine critical performance criteria for the processor and communications modules.

In the design validation of the Midrange Architecture System for executing advanced motion logic and discrete I/O logic, the network layout, devices and configurations were entered in the IAB software using the APC to determine the estimated performance of the entire motion system. A similar IAB analysis was conducted for the various network topologies.

Results provided insight into the motion system, displaying utilisation for the Ethernet media, communications controller and Logix controller. Such metrics can help identify potential bottlenecks or limitations in the overall motion system during the sizing and selection stage of the design process.

Metrics are defined with a three-level rating system represented by a green, yellow or red set of indicators. Typically, desired results range from Level 0 (green) to mid-Level 1 (yellow) values. Results at Level 2 indicate that the system has exceeded the acceptable limits and modifications will be needed to reduce the demand on resources.

Coining control at the Royal Australian Mint

A re-imagined materials handling solution, paired with the latest control and automation technology, delivers optimised workplace safety, improved security and enhanced production efficiency at the Royal Australian Mint.

When the Royal Australian Mint invited tender submissions to carry out the complete redevelopment of its coin production and warehousing facility in Canberra, innovation was high on its list of selection criteria. A heavy reliance on manual labour, aging equipment and outdated processes had seen the development of inefficiencies in some areas, and had the Mint looking for a contemporary materials handling solution.

In seeking out such a solution—one that would optimise workplace safety, improve security and enhance production efficiency—the Mint cast the net far and wide. Following a competitive tendering process, the Mint awarded the project to materials handling systems specialist, Australis Engineering.

Australis Engineering redesigned the entire materials handling and warehousing operation, rather than simply automating the Mint's existing processes. A key element of the design was a sophisticated information-enabled automation and control solution from Rockwell Automation.

Manual money making

The Mint's coin production process is carried out across three levels of the facility. Prior to the upgrade, coin blanks would arrive in 200-gallon drums, then be transferred into wheeled tote bins which were positioned over hoppers to feed multiple individual coin presses on the production floor below. Once pressed, the coins were counted, dispensed into tote bins, tipped into drums and readied for packaging or delivery.

For the majority of the production process, the drums of blanks, tote bins and finished coins were manoeuvred about the facility and emptied using manually operated forklifts. The high level of manual handling, combined with the forklift and worker interaction, had become a safety concern. Removing this reliance on manual handling, maximising the physical separation of workers and forklifts, and improving overall system safety were key drivers that prompted the upgrade.

"While improving safety was one of the primary goals of the facility upgrade, we also set out to address issues of security and accountability," says Royal Australian Mint's Chair of the MHWS Steering Committee, Ms Marlene McClelland. "We've implemented a highly integrated and automated process to ensure that blanks and finished coins are properly accounted for—from receipt of raw material, through the production process, to quality control, warehousing and dispatch."

Automated efficiency

Australis Engineering ensured that automation lies at the heart of the Mint's upgraded production facility. Automatic guided vehicles (AGVs), a robotic decanter, numerous belt-, roller- and bucket-conveyors and an innovative multi-axis bucket conveyor have replaced the human-operated forklifts and much of the manual labour. Equipment, such as stretch wrappers, coin inspection and robotic packaging technologies, and an automated Vision Counting System (VCS), have also been incorporated into the production process.

The automation and control solution, paired with production intelligence software from Rockwell Automation, oversees the control and operation of the upgraded process. Implemented by system integrator, Start Services, the new control system permits a more efficient movement of materials through the Mint's facility.

Upon receipt, each drum of blanks is assigned and labelled with a unique identification barcode, which it retains for the duration of the manufacturing process. On the direction of the control system, AGVs take the bar-coded drums to a holding area and, when required, on to the robotic decanting station. Once decanted, the blanks are fed by the VCS into the multi-axis bucket conveyor which transfers them to any one of the coin presses.

Once pressed, the newly minted coins are re-counted and transferred to the packaging area, and loaded into drums, small bags or bulk cartons.

"By incorporating centrally controlled AGVs, robotic systems, the VCS and the multi-axis bucket conveyor into the process, we've managed to eliminate the potentially dangerous and time-consuming manual handling tasks while also significantly improving auditing functions," says Anthony Gustafson, Engineering

Director at Australis Engineering. "As a result, the Mint's production floor is a safer, more secure working environment, with a substantially improved audit trail for circulating coins." The upgraded facility has been designed to process 2.2 million coins per day, and in practice can achieve in excess of 2.4 million coins per day.

Comprehensive control

The Mint's upgraded control system features an integrated control architecture, comprising a network of controllers, drives, EtherNet/IP communications and distributed I/O—all linked to a site-wide manufacturing execution system (MES) founded on FactoryTalk production and performance software.

Standard sequential control functionality is managed via a ControlLogix controller, while safety applications are controlled using a GuardLogix controller. Two separate EtherNet/IP networks—one for standard and safety communications, and one linking the controllers to the RAM's MES—are also employed. A distributed array of both Point I/O and Guard I/O with EtherNet/IP connectivity supports the facility's distributed I/O requirements.

A real-time EtherNet/IP socket interface was developed by Start Services to link the proprietary AGV host PC with the MES system. "The MES acts like a soft-controller, interfacing and responding to the AGV host computer," says Richard Bailey, Start Services Director. "This allows the Mint to track the site's inventory and obtain the status on any one of the 1000-plus pallets live in the system." Similarly, other third-party systems, such as the coin counting machines, barcode scanners and printers, and robotic systems are interfaced with the control system.

Control sequences, such as blank-decanting and coin-pressing are all self-contained. However, some control sequences interact with each other, or rely on instruction from the MES. For example, when a new empty pallet is delivered to a coin press for filling, the MES will identify the pallet and inform the controller that the pallet is in position. The controller then takes over, executing the control sequence. Once complete, the controller informs the MES.

Each of the coin presses and the packaging area is equipped with a mobile control station trolley equipped with a VersaView industrial HMI computer. With connectivity to the MES, the HMIs provide an information display of machine status, operator command display, and alarm annunciation and acceptance.

"The HMIs provide an instant visual overview of the process elements and activities within the complex materials handling process," says Ms McClelland. "This assists us with identifying and remedying potential process hold-ups quickly, resulting in optimised productivity."

SIL 3 safety

In addition to minimising the extent of manual handling processes, the separation of machinery, AGVs and staff on the production floor was paramount. Here, safety light curtains protect the robotic decanting, packaging and conveyor areas, while each of the coin presses incorporates emergency stop buttons.

The GuardLogix-based safety control system ensures that all energy sources are isolated and the equipment has come to rest before any of the access gates can be opened. Gates are fitted with Guardmaster interlocking systems, which provide SIL 3-compliant latching functionality in the safety zones. Similarly, if light curtains are breached, the safeguarded machinery is automatically shut down.

The facility's variable speed drive applications (used to regulate the speed of the plant's conveyors) are founded on the PowerFlex 70 AC drive with 'DriveGuard' option. 'DriveGuard' consists of an electronics card internally mounted within the drive that equips each drive with 'safe off' functionality compliant with Category 3. Importantly, it achieves this functionality without requiring the dual drive output safety contactors typically used in legacy Category 3 drive applications.

Information to act on

The facility's highly functional MES allows the RAM to capture, consolidate and distribute data throughout the enterprise in a purposeful and service-oriented way. Here, the FactoryTalk Production Centre and FactoryTalk View SE platforms play a vital role.

"This information management architecture allows the RAM to fully leverage production data," says Johan Lourens, Rockwell Automation Quality & Project Manager. "It presents a powerful tool for process optimisation and improvement, product tracking and scheduling, as well as reporting, reconciliation and communications to other management systems, such as the enterprise resource planning (ERP) system."

Coin and blank inventories can be tracked while maintaining a production history. High level production coordination, including assignment of coin presses, management of process and control tasks, and control of third-party equipment can be achieved, ensuring production goals are met. Furthermore, customised reports can be configured and generated, and long-term records of production outcomes can be kept.

"Previously, inventory management was a manual process, so the ability to track product movement and obtain instant inventory reports streamlines this process," says Ms McClelland. "With high levels of control and information gathering, we are now able to gain a better understanding of the consumption patterns and productivity of our coin pressing process. This level of insight has enhanced our understanding of production capabilities and will assist in future strategic planning."

Swift, secure and scalable

According to the Mint, the production facility's performance has been steadily improving since final commissioning, with a quantifiable increase in productivity.

Workplace safety and security has also improved at the Mint. "The automation of forklift operations has been key to this improvement in safety," says Ms McClelland. "Also, with the ability to trace product from the supply of blanks, through our processes to our customers, we have realised significant improvements in the secure handling of materials."

"We're very pleased with the control solution, as it's not a static system," says Ms McClelland. "It will support future continuous improvement efforts, as it allows us to expand and build on the existing control architecture and programming. As a result of this project, the Mint is now equipped with world-class automated materials handling infrastructure." AT

MANUFACTURERS STRIKE BALANCE BETWEEN

INFORMATION ACCESS AND SECURITY

Securing a manufacturing facility requires a thorough understanding of all aspects of production.

To meet today's productivity goals, everyone – from engineers to executives – needs better insight into plant-floor operations. A wave of technology advancements is making this possible, from information-enabled programmable controllers to modern human-machine interface (HMI) technology that helps people at any level access the data they need. However, these advancements also introduce an unwelcome wave of security risks, resulting in potential consequences such as downtime and lost data.

A robust security program helps manufacturers leverage the immense benefits of electronic technology while addressing its inherent risks – unwanted and potentially destructive events. However, just as no manufacturing operation is exactly the same, there is no one-size-fits-all security solution.

A successful industrial control system security strategy begins with a thorough asset-based risk assessment of every aspect of an enterprise. That leads to a custom roadmap containing best-practice-based security policies and, often, advanced technologies that help reduce risk and protect manufacturing assets.

Building a Security System

In designing a security system, manufacturers first must understand all aspects of production, according to Brad Hegrat, Industrial Security Business Manager, Rockwell Automation®. Then, they can create multiple layers of security to protect networked assets, data and end points. Understanding each layer is the key to security, which helps increase uptime and, ultimately, the bottom line.

A comprehensive security program lays the foundation for balancing security and access to information. Most manufacturers today can only access one or two system aspects, such as network flow data or communication pathways. Without insight into the other system aspects, engineers don't have access to a vast range of diagnostic and security capabilities, such as protecting devices, control rooms, highly sensitive areas and other valuable assets.

Building the optimal security system starts with a cross-functional team, explains Hegrat. Controls engineers and IT professionals have to combine

their knowledge and expertise to create the most effective security program. But bridging the gap between the two groups is tricky because they have different goals, priorities and procedures.

For example, when dealing with data, IT professionals value confidentiality, then integrity and, lastly, availability. Controls engineers typically prioritise these attributes in the opposite order: availability, integrity and then confidentiality. Also, IT specialists consider 98 percent uptime great for their business network, but this is unacceptable to most controls engineers responsible for high-profile processes.

This stems, in part, from different business models. IT specialists have the luxury of horizontal scalability, meaning they can connect multiple hardware or software entities, such as servers, that work as a single logical unit. When multiple servers work together as one, the failure of one has little – if any – effect on operations. Controls engineers, on the other hand, are locked into a vertical scalability model in which entities, such as ovens in a food processing plant, do not work as a single logical unit. If one oven fails, it impacts overall production, making individual system uptime critical to many manufacturers.

Forward-thinking manufacturers tackle differences like these by finding common ground and focusing on key priorities. The top priority for everyone on the team is securing the manufacturing facility with policies and procedures, as well as physical and electronic barriers for each production zone to ensure system and process uptime. This cross-functional team should develop comprehensive rules that address all possible users, whether on-site or remote, machine builders or employees, human resources or engineering.

Regardless of who poses the production risk, manufacturers must control who can access the system. Software tools like the FactoryTalk®

Security-enabled software suite from Rockwell Automation help control access by providing capabilities like authentication and role-based authorisation. This service verifies the identity of each user who attempts to enter the automation system and grants access only to those authorised to perform particular actions on a system's features and resources.

In addition, developing layers of network security help protect control and information data. Firewalls and demilitarised zones (DMZs – which create a neutral place between the manufacturing and enterprise zones, preventing traffic from directly traveling between the two zones) help prevent unwanted people, viruses and spyware from intruding into either zone.

Microsoft® Windows®-based point-of-sale system that connects to a credit card reader, reservation system and the hotel intranet. In this process, there are strict technical controls in place to prevent unauthorised use of the terminal; the account the employee uses while operating this device is not part of the administrators' group but part of a group with restricted privileges, such as the standard users' group. This operation of using an account with the minimum requirements to meet the job function is an example of Least Privilege.

The second, the Principle of Least Route, notes that devices are only given network access to fulfill a function. For example, in an office environment at the network layer,

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The top priority for everyone on the team is securing the manufacturing facility with policies and procedures, as well as physical and electronic barriers for each production zone to **ensure system and process uptime**.

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However, security cannot be set so high that it unnecessarily restricts legitimate access and necessary control of production. To strike a balance, a security plan should follow two guiding principles designed to help manufacturers evaluate potential vulnerability and determine mitigation techniques.

The first tenet, the Principle of Least Privilege, says that manufacturers should only give users credentials to fill a job function, preventing them from accessing things they should not control, within a system or a particular machine. An example of this principle can be found in business travel. When a person checks into a hotel, the front desk associate takes ID and credit card information, verifies the reservation, checks the guest into the hotel and provides the room keys. The computer that the associate uses is typically a

there are no protections from errant Layer 2 communications (switched traffic). Essentially, one employee on the network could communicate via the network with an employee in the neighboring office, irrespective of the business reason to do (or not to do) so. Enterprise networks are constructed with the intention of end-to-end, seamless and ubiquitous access across all nodes of the environment.

In purpose-built networks such as industrial control systems, storage-area networks and Internet-facing DMZs, errant Layer 2 or switched communications can have demonstrable effects on the up-time, security and overall performance of those environments. Therefore, one must take care in restricting that Layer 2 traffic as tightly as possible while still fulfilling its intended purpose.

A manufacturer with multiple

NETWORK HEALTH

production lines may designate a PLC to be used only on Line 1. The network should be constructed so that Line 1 is restricted to its own very small subnet. This allows the line to be protected by either industrial firewalls or Layer 3 access control lists (since one has to route to get to that Line 1 specific subnet), as well as preventing Line 2, and other areas, from having a negative effect on Line 1. By limiting the Layer 2 traffic in such a manner, this control system follows the Principle of Least Route. The Principle of Least Route is the antithesis of that enterprise network model where all nodes have end-to-end, seamless and ubiquitous access.

The HMI Impact

The hub of human interaction with technology is the HMI. Much has been said over the years about physically hardening computers so they withstand harsh conditions on the factory floor, but security threats require hardening at a whole new level.

The same best practices that IT professionals apply to enterprise computers should also apply to manufacturing computers. To help protect against system mismanagement, manufacturers should have sound patch management strategies, ample configuration management documentation and sufficient means to test and roll out anti-virus definitions. Disabling the guest account and implementing a guest policy

provides controlled access without compromising security.

Uninstalling unused components like Windows programmes (e.g. Outlook® Express) and USB ports is another best practice. This helps prevent users from performing tasks unrelated to production, such as checking their email or plugging an unauthorised virus-laden USB memory key into a USB port. While seemingly harmless, such activities can result in viruses or unplanned downtime.

Applying these best practices opens the door to a new level of information access. Hegrat explains that through an HMI, operators have a dashboard to securely monitor, manage and control all aspects of production. Taking a layered approach to security provides the foundation for a robust visualisation system that helps ensure operators only perform acceptable tasks and guard critical manufacturing information.

"As quickly as information access advances," Hegrat concludes, "so do the security threats that can lead to catastrophic losses in productivity, assets and data. A well-planned, comprehensive security strategy enables manufacturers to strike the right balance that optimises access without jeopardising production." **AT**

MANAGING THE SECURITY LIFE CYCLE

Security throughout the automation life cycle of a control system requires ongoing investment to help protect the system from evolving threats. It is essential to proactively plan and implement a control system strategy that accounts for obsolescence and associated risks with aging products and systems, says Doug Wyle, Industrial Security Business Development Manager, Rockwell Automation®.

Security needs to encompass both technical and nontechnical factors to address risk. By maintaining the competency of control system operators and maintenance personnel, evolving

security risks can be mitigated. Important focal areas of life cycle management include training and continuous improvement; monitoring of people, processes, and components; auditing; and maintenance.

The awareness of industrial systems being targeted is likely to increase with more direct attacks being expected in the future. Indirect attacks will always exist. More systems will be designed from the ground up to be secure, changing the focus from physical security to auditing the system and continually monitoring compliance and up-to-date technology.

Specialist consulting services can

often help achieve a more thorough and complete evaluation of security posture. The Network & Security Services group of Rockwell Automation has the expertise to help address industrial security concerns in a balanced way. Wylie explains that Rockwell Automation will continue to make ongoing investments in product development and asset management to help customers attain their goals in secure industrial control solutions. The company will continue to work with its customers to help address risks to safety and the operational integrity of customers' control systems.

Leveraging Cloud Computing for Asset Management

Rockwell Automation helps oil and gas equipment builder access asset management data remotely via cloud computing technology.

M.G. Bryan Equipment Co., an equipment builder for the oil and gas industry, uses cloud computing for remote asset management of high-tech fracturing equipment. Its new control and information system, designed and integrated with Rockwell Automation®, leverages the Windows® Azure cloud-computing platform from Microsoft® Corporation.

The solution enables M.G. Bryan to secure remote access to real-time information, automated maintenance alerts, and service and parts delivery requests. In addition, with assistance from Rockwell Automation, the company designed a simple, user-friendly system using the cloud to improve productivity and business intelligence.

Matt Bryan, president of M.G. Bryan, explains that fracturing vehicles operate in extreme, isolated environments. They typically require new oil filters every 200 hours and complete engine rebuilds after 4,000 to 5,000 hours of service. "By leveraging the cloud," he says, "we can cost-effectively keep tabs on our equipment and help customers maximise asset uptime, dramatically improving their return on investment."

Rockwell Automation upgraded M.G. Bryan's fracturing equipment with a tightly integrated control and information system that brings together disparate information sources, including historical, relational and transactional data. To fully leverage this rich data without requiring M.G. Bryan or its customers to build and manage their own datacenters, Rockwell Automation turned to cloud computing. Using mobile technology and the seamless transfer of business information over the cloud, M.G. Bryan has access to a higher degree of connected intelligence, enabling new levels of customer service in this industry.

Using mobile technology and the seamless transfer of business information over the cloud, M.G. Bryan has access to a higher degree of connected intelligence, enabling **new levels of customer service** in this industry.

With the new system, data can be pulled from the cloud via mobile devices and web browsers to produce reports and dashboards on the condition of individual vehicles' drivetrains and on hydraulic fracturing performance, as well as process performance and maintenance trends related to entire fleets. The flexibility and scalability of cloud computing will help M.G. Bryan offer holistic operations management to its rapidly expanding fleet of vehicles. **AT**

Integrated CIP Motion over EtherNet/IP Removes Automation Hurdles

Technology paves the way for manufacturers to handle automation, discrete, process, safety and motion on a single network.

The addition of Integrated CIP Motion™ into the extensive list of capabilities of EtherNet/IP™ reinforces the fact that this industry-proven communication protocol is steadily becoming the first point of call for many of the world's leading process companies, machine builders and end users. In addition, with integrated CIP Motion on EtherNet/IP being available on the new Midrange Architecture System from Rockwell Automation®, these advanced capabilities can now be enjoyed by a much wider industrial audience.

Since its conception nearly 40 years ago, Ethernet has undergone a constant evolution – which has not lost any of its pace – as it becomes faster, more robust and eminently suitable for a much wider range of applications. It has also seen a number of tailored protocols developed to exploit its capabilities in a wider arena of operations.

One such derivative, EtherNet/IP, is setting the pace in the industrial arena, primarily due to its adherence to the main Ethernet standard. This contrasts with other industrial Ethernet solutions that bypass certain elements of the Ethernet model in order to achieve particular performance goals. This modified approach, unfortunately, leads to the need for proprietary hardware, firmware and software to handle those portions of the application that require real-time control, none of which restrains the deployment of EtherNet/IP.

Through its standard-based approach to Ethernet, EtherNet/IP has kept pace with the rapid development and enhancements experienced by the core protocol. So much so that it is now feasible to run an entire manufacturing or process operation on a single, scalable network, thanks to the adherence of EtherNet/IP to the same Ethernet protocol used in the office environment. By offering seamless data exchange from the shop floor to the enterprise level, companies are capable of making significant savings in both engineering efforts and deployment/commissioning costs.

Future-Proofing Assets

One of the most recent advances for EtherNet/IP is the addition of integrated CIP Motion, the introduction of which now means that companies can handle automation, discrete, process, safety and motion on a single network. This is made even more attractive by the fact that all of these primary control disciplines can be programmed using a single, scalable software environment – RSLogix™ 5000. With the introduction of these capabilities into its new Midrange portfolio, Rockwell Automation is also bringing this control solution – normally seen in much bigger installations – down to single-machine or cell level.

There are many reasons why the single-architecture approach to motion is attractive to the industrial market. Looking at it from a holistic perspective, many machine builders and end users have to address multiple scenarios such as integration, safety, information, diagnostics and sustainability. More often than not, these will involve multiple protocols with equipment from many vendors, all of whom ultimately have to "talk" to each other to produce an outcome that, although feasible in terms of actual performance and end results, may not be feasible in terms of cost and the applied engineering effort.

The simplicity and functionality of the single-network approach is what makes EtherNet/IP so attractive. And, as it is based on an unmodified and established protocol – which has an extremely positive past, present *and* future – the investment in EtherNet/IP is very much a long-term commitment towards future-proofing assets and effectively integrating them with the wider enterprise.

Deterministic Control

The question on many people's lips is: "If other companies have had to modify Ethernet to handle motion, why haven't you?" Most competitors will point to speed as being the defining reason for the perceived unsuitability of EtherNet/IP for motion applications. However this is, in fact, a flawed argument and is disproven by the way EtherNet/IP handles motion commands.

Open DeviceNet Vendor Association (ODVA), the organisation that supports network technologies built on the Common Industrial Protocol (CIP™),

DeviceNet™, EtherNet/IP, CompoNet™ and ControlNet™, sums it up nicely. Typically, multi-axis motion control uses event-based synchronisation, which requires scheduled, absolute hard delivery of time-critical cyclic data across the network. Jitter of less than 1µs for cyclic data is necessary for precise speed and/or position control. But the CSMA/CD data layer of Ethernet is not capable of delivering data with less than 1µs of jitter.

This determinism problem might seem to rule out standard unmodified Ethernet for motion control, but ODVA has overcome this limitation with EtherNet/IP without resorting to changing any of the four lower layers of Ethernet, using standard, unmodified Ethernet and TCP/UDP/IP.

EtherNet/IP with CIP Motion solves the problem by changing the strategy for determinism. It removes the requirement for strict determinism from the network infrastructure and entrusts the end devices with the timing information necessary to handle the real-time control needs of the application.

EtherNet/IP with CIP Motion can thus deliver the high performance, deterministic control required for closed-loop drive operation, using standard, unmodified Ethernet. Clock synchronisation of better than 200 ns can be readily achieved, meeting the needs of the most demanding motion control applications. Because the clocks in the end devices are tightly synchronised, a small amount of jitter in receipt time of the message is unimportant, because information in the message is time-stamped. EtherNet/IP with CIP Motion allows 100 axes to be coordinated with a 1 ms network update to all axes.

Competitors may still argue that 1 ms is still not as fast as what they can offer, but in real-world applications, the mechanical constraints/inertia imparted by what is being driven by the motion solution make this point moot. The likelihood is that the end application is for packaging or label applications; in these instances, 1 ms is more than adequate and, indeed, is for the majority of motion applications.

The benefits of migrating to an EtherNet/IP-based solution for motion are many and must be considered in parallel with the needs of the wider system and enterprise. Scalability, flexibility, seamless integration, a single operating environment and an Integrated Architecture™ all work together to make it an extremely attractive proposition, not just for motion but also for machine and process control in their broadest sense.

What's more, future-proofing plays a huge role, as the inevitable migration to Gigabit Ethernet is easy for both users and device suppliers due to maximum leveraging of commercial off-the-shelf technology.

Only EtherNet/IP with CIP Motion technology combines the requirements of deterministic, real-time, closed-loop motion control with "standard" Ethernet, offering full compliance with Ethernet standards, including IEEE 802.3 and TCP/IP. AT

Scalable Automation Solutions Cater to Ever-Changing Market Needs

The new Midrange portfolio from Rockwell Automation enables users to transfer programmes from one controller to another with minimal engineering effort.

Agility and flexibility are essential facets of the modern manufacturing environment. Companies that can offer rapid changeovers, increased throughput and multiple product formats within very short timescales are arguably going to be the first point of contact for original equipment manufacturers (OEMs) and end users alike.

To achieve this type of agility, more and more organisations are turning to automation suppliers that understand their needs and can supply scalable automation solutions that allow them to cater to the ever-varying market needs that they face.

The enhanced Midrange Architecture System portfolio from Rockwell Automation® will help machine builders and OEMs address many of these needs, thanks to increased processing power, advanced motion capabilities, EtherNet/IP™ networking and seamless scalability within the range of programmable automation controllers (PACs).

The Power of Scalability

By bringing the ControlLogix® L7 engine into the CompactLogix™ form factor, Rockwell Automation can provide value-driven machine builders with performance features such as Integrated CIP Motion™ over EtherNet/IP – for both servo drives and AC drives – at a much lower pricepoint. This gives users one network, a single development environment and a full, integrated axis portfolio, explains Lee Lane, business director, Architecture and Software.

In terms of Midrange hardware, the Allen-Bradley® CompactLogix L1 PAC is a solid and dependable starting point for simple automation applications. Compared to its predecessors, the L1 exhibits faster processors and greater memory, as well as other advanced features, forming a viable alternative to more expensive units available from other companies in the automation domain. The L2 and L3 models expand on the L1's capabilities, giving users an increasing range of options and performance characteristics that can be matched to their precise needs.

One of the core strengths of the new CompactLogix range is its scalability. Seamless scalability within the range means that users can develop an application using an L1 PAC, for simple machines, and, if the machine requires more I/O or a higher axis count, the user can simply migrate up to the L2 or L3 PACs. All the PACs within the new Midrange portfolio use the same common development environment and programming language, so the programmes can be simply and easily transferred to another controller with minimal engineering effort.

Scalability also plays a huge role should the user need to migrate to an even more powerful solution for more complex machines. Use of the same common development environment and programming language enables companies to migrate up to Allen-Bradley ControlLogix PACs just as easily as migrating within the CompactLogix family. Once again, this offers immense savings in terms of time, engineering effort, commissioning and training.

Tools to Enhance Productivity

With Integrated CIP Motion now being available on the Midrange PACs, users can also develop advanced motion solutions covering anything from as low as two axes in the L1 up to 16 axes in the L3. Coupled to the new Allen-Bradley Kinetix® 350 Servo Drive, users now have access to a solution more suited to standalone applications with low axes counts.

Lane notes that with the Logix5000™ development environment, users can also take advantage of Motion Analyzer from Rockwell Automation, which makes analysis, optimisation, simulation and selection of motion control systems faster and easier, giving engineers a powerful set of tools to assess their design prior to committing to capital outlay.

With EtherNet/IP communication being a core facet of the Midrange portfolio, Rockwell Automation has also developed Ethernet switching technology specifically designed for Midrange applications, with the launch of the Stratix 5700™ industrial Ethernet managed switch – with Cisco® Technology.

Tools for configuration and monitoring also have been developed for both IT and manufacturing professionals. These tools can provide secure integration to the enterprise network while allowing for easy setup and diagnostics from within the Rockwell Automation Integrated Architecture™.

Scalability is quickly becoming the ultimate target for many machine builders and end users; but what they need is a scalable solution that also offers easy migration and minimal additional engineering effort. The new Midrange portfolio from Rockwell Automation has been developed to address these specific needs -- and to help companies achieve short-term objectives while still keeping an eye on the medium- and long-term demands of the market. AT

on the web

For more information on the Rockwell Automation midrange portfolio, visit:
http://ab.rockwellautomation.com/Programmable-Controllers/CompactLogix

Integrated Motion on EtherNet/IP Simplifies Motion Design

Machine builder leverages Rockwell Automation solutions to develop a flexible, robotic, bottle-handling palletiser system.

P roduction Automation Inc. (PAI), a U.S. machine builder in Montgomery, Alabama, specialises in building palletisers used in the beverage industry. Over the years, the company has seen many evolutionary changes as technological advances have allowed producers to trim the plastic used in bottles, vary pack sizes, and serve a range of retail outlets and consumers.

Traditionally, palletisers have used physical diverters to sort products into specific patterns for packaging. Each new pack size or configuration requires a new pattern, meaning

Integrated motion on EtherNet/IP simplifies design, control and integration of the Gantry Hybrid Palletizer with a singular programming environment.

diverters must be added, removed or rearranged. This conversion typically translates into three days of downtime, including testing. What's more, the cost of new diverters, turning devices or other components can run into tens of thousands of dollars.

In addition, diverter-based palletisers can have trouble sorting and packing thinner bottles at high speeds without product damage and loss. Dents, popped-tops and product spills can result, equating in financial losses for the bottler.

While robotic-arm palletisers have been developed as an alternative to diverters, they are often expensive to run and maintain. And, robotic arms often require separate control platforms and even separate communication networks to carry out high-speed, precise motion.

To address these challenges, PAI chose to develop a machine to handle various pack configurations and sizes, as well as thinner bottles. The company collaborated with Montgomery, Alabama-based Kendall Electric Inc., a Rockwell Automation® distributor, on system design and delivery.

An Integrated System

The result of the team's efforts was the Gantry Hybrid Palletizer, a machine that utilises integrated motion on EtherNet/IP™ to provide the flexibility and ease-of-use PAI's customers wanted, without sacrificing speed or handling quality.

The machine incorporates a dual-head gantry crane that stands above a conveyor belt carrying a steady stream of bottle packs. A robotic arm extends from each crane and moves laterally, reaching down to grab a case and position it into a predetermined pattern for palletising. Guards are raised at various points along the conveyor to hold cases in place. At the end of the conveyor, the arranged cases are lowered onto a pallet in layers for shipment, based on order requests.

PAI chose to network the entire machine on EtherNet/IP because it can handle large amounts of data at high speeds. Movement instructions for the palletiser's robotic arm travel over the EtherNet/IP network from an Allen-Bradley® ControlLogix® programmable automation controller (PAC). Because EtherNet/IP relies on standard infrastructure components, it can be integrated into a plant-wide Ethernet network without gateways or routers.

The PAI design team used EtherNet/IP-ready Allen-Bradley® Kinetix® 6500 servo drives to control Allen-Bradley MP-Series™ low-inertia motors. Allen-Bradley Stratix 6000™ managed switches direct network traffic and reduce the amount of data on the network. Motors and servo drives are configured using the same Rockwell Software® RSLogix™ 5000 design and configuration software.

Reducing Design Time

PAI reduced design time by using the free Allen-Bradley Drives and Motion Accelerator Toolkit (DMAT) with Motion Analyzer design software. The tools helped PAI design and produce a working physical model of the Gantry Hybrid Palletizer in just three months – less than half the usual development time.

Choosing integrated motion on EtherNet/IP and leveraging the free design tools allowed PAI to develop a system that lets its customers modify the pattern of a pallet stack without massive mechanical or software changes, reducing downtime and making the machine easier to maintain. **AT**

Get Load-Bearing Linear Motion Out-of-the-Box

The Allen-Bradley® Integrated Linear Thruster provides machine builders with high-speed, load-bearing linear motion out-of-the-box. The LDAT-Series Integrated Linear thruster is capable of pushing, pulling or carrying loads.

The linear thruster combines high velocity, up to five metres per second, high levels of acceleration and peak thrust forces ranging from 168 to 4,305 Newtons to help maximise performance. It is suited to applications that currently use a custom-designed belt actuator or linkage device that converts rotary into linear motion, including cartoners, stackers, case packers, case and tray formers, in-out feeds, diverters, ejectors, drop gates and horizontal conveyors.

Direct drive technology increases reliability by eliminating wear items associated with rotary-to-linear motion conversion. Integrated linear bearing carries loads without having to mount and align external bearings.

By using Motion Analyzer software (version 6.0 or higher), users can select and simulate the most efficient drive-actuator combination to optimise performance and minimise energy consumption.

To minimise installation time, the Integrated Linear Thruster can be used with any Allen-Bradley servo drive; it uses the same SpeedTEC® DIN connectors as the rest of the Allen-Bradley servo motor family for a quick, secure assembly.

For more information, visit:
*http://ab.rockwellautomation.com/
motion-control/actuator/
integrated-linear-thrusters*

Allen-Bradley® Kinetix 5500 Servo Drive and VP Low Inertia Servo Motor

Rockwell Automation has expanded its Integrated Architecture with the Kinetix 5500 servo motor and VP Low Inertia servo motor offering. Combined as a system, they can provide a cost-effective motion solution that delivers the high performance and scalability you need to compete in today's industry.

Enhancing the current midrange architecture portfolio, this motion system is designed to connect and operate with the new family of CompactLogix™ controllers using Studio 5000 Software supporting Integrated Motion on EtherNet/IP.™ With the benefits of this motion system, you can now run motion applications on a single control platform, using a single network – simplifying the design, operation and maintenance of equipment.

With its innovative, compact design, the Kinetix 5500 requires less panel space and can be connected easily. In addition, you can reduce installation and commissioning time by using just a single cable. You can now get the feedback, motor break and motor power all in one cable – simplifying wiring and reducing inventory. To further enhance the design, the Kinetix 5500 has dual Ethernet ports allowing for multiple topologies.

For more information, visit:
http://ab.rockwellautomation.com/motion-control/kinetix-5500-servo-drive

Allen-Bradley SMC-50 smart motor controller

Rockwell Automation introduces the Allen-Bradley SMC-50 smart motor controller, the company's latest generation of solid-state motor controllers. This release includes a newly designed three-phase, fully solid-state, silicon-controlled rectifier (SCR) power structure. The new SMC-50 controller addresses the motor control needs of OEMs and end users seeking a more economical alternative to drives and more advanced control than across-the-line starters. Designed for customer flexibility, the SMC-50 controller combines advanced monitoring and protection features, multiple start and stop options, and expandable control inputs and outputs. These features help users increase efficiency, reduce downtime and improve control.

Rated at 200V-690V AC and with software from 90 to 520 amps, the SMC-50 controller is ideal for controlling motor speed and torque in a range of normal-duty applications, including pumps, compressors and short conveyors, as well as in heavy-duty applications, such as rock crushers, wood chippers, centrifugal fans and long conveyors.

For more information, visit:
http://ab.rockwellautomation.com/motor-control/soft-starters/smc-50

Design and Validate New Machine Concepts

Motion Analyzer 7.0 Software is a motion-application sizing tool for analysis, optimisation, selection and validation of Kinetix® motion control systems.

The software facilitates the machine design process, enabling users to design and validate new machine concepts without purchasing or installing physical equipment.

The software, available as a free download, now supports simple language switching, including Simplified Chinese. With Motion Analyzer 7.0, users can:

- Create and simulate multi-segment cycle profiles to determine the best solution for your application needs
- Link 3D mechanical designs in SolidWorks 3D CAD to the generation of control programs in RSLogix™ 5000 software
- Export motion profiles directly into RSLogix 5000 software to catalyze start-up and commissioning
- Optimize machine sustainability using Ratio Analysis and System Efficiency Analysis tools
- Verify system performance and maximize long-term machine reliability
- Select from a full range of Kinetix motion control products and features to complete machine design
- Generate Bills of Materials (BOM) using a rule-based approach

For more information, visit:
*http://ab.rockwellautomation.com/
Motion-Control/Motion-Analyzer-Software*

Rockwell Automation Updates RSLogix 5000
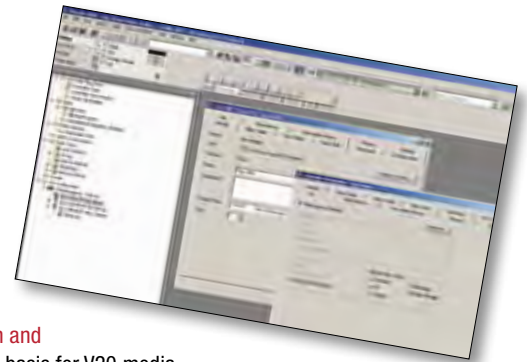
V20.01.00 RSLogix™ 5000 Design and Configuration software serves as the basis for V20 media in both English and international versions. The software delivers the high performance of an integrated control system for machine builders, system integrators and end users looking for a single control infrastructure with a single development environment that scales to match application requirements in process, batch, discrete, drives, safety and motion disciplines.

This release features controller firmware update and new CompactLogix™ L2 controller firmware.

V20 enhancements included support for a broader range of controllers, I/O and drives, including the single-axis Kinetix® 350 servo drive; broader device integration; enhanced safety features; and Integrated CIP Motion™ on EtherNet/IP™.

For more information, visit:
http://www.rockwellautomation.com/rockwellsoftware/design/rslogix5000/whatsnew.html

Non-Display Computers for Control Room or Factory Floor

Non-display industrial computers enable users to enhance the performance of their applications.

Allen-Bradley® industrial computers are built to complement the suite of Rockwell Software® solutions. Whether used in a control room or on the factory floor, these computers provide users with solutions to space limitations, mounting limitations and other requirements.

Non-display models in machine mount and 4U rack-mount configurations feature "performance" and "server" levels. Computers deliver the same housing and dimensions as current models. They come installed with Windows® Server 2008 RS/Windows 7 64-bit or Windows XP Pro SP3. Performance improvements are said to be 10x the CPU Mark score.

Computers include the Unified Extensible Firmware Interface (UEFI) with integrated diagnostics for booting an operating system and running pre-boot applications as well as the Intel® Active Management Technology (AMT), which enables users to query, restore, upgrade and protect devices remotely.

The server version comes with RAID 1 feature. With two hard disks, if one fails, the other still runs.

For more information, visit:
http://ab.rockwellautomation.com/Computers/Non-Display-Computers/Bulletin-6177

ControlLogix Redundancy Modules

ControlLogix® 1756-RM2 Redundancy Modules support redundant controller architectures with no additional programming required.

Programs are cross-loaded automatically from the primary to the secondary controller. The primary automatically updates the secondary with data changes to maintain controller synchronisation. If the primary fails, control switches to the secondary automatically. Controller redundancy is transparent to devices connected over an EtherNet/IP™ or ControlNet™ network.

1756-RM2 features higher data throughput rates, 1 GB fiber speeds, redundant fiber channels and enhanced diagnostic display. It is compatible with firmware versions used with 1756-RM as well as with the same communication modules.

Existing systems must be upgraded in pairs. Both primary and secondary chassis must have 1756-RM2 since that device will not communicate to a 1756-RM.

For more information, visit:
http://ab.rockwellautomation.com/Programmable-Controllers/ControlLogix-Redundancy-Modules

Rockwell Software PharmaSuite Improves Time to Results in Life Sciences Industry

The latest release of Rockwell Software® PharmaSuite™, version 4.0, targets regulated industries, setting a new standard for lower risk, lower cost and improved time to results while meeting regulatory requirements.

The software contains a comprehensive set of functions that address the most common applications like dispensing, quality and electronic batch recording. It allows regulated manufacturers to meet their operational goals and productivity requirements in a consistent and predictable way. The software tracks material, equipment and personnel involved in the manufacturing process and maintains a complete electronic batch record.

Rockwell Software PharmaSuite is based on S88 and S95 standards, which allow for better integration with other enterprise systems involved in manufacturing operations. It is built on the FactoryTalk® ProductionCentre platform. Release 4.0 introduces Intelligent Migration and Modeling Support in recipe authoring.

For more information, visit:
www.rockwellautomation.com/rockwellsoftware/lifesciences

Pavilion8 Software Simplifies Model Predictive Control

New tools have been added to the Rockwell Automation® Pavilion8® Model Predictive Control software that give users the ability to create simple to complex process models on their own.

Pavillion8 version 4.0 gathers data from within a facility – including equations, empirical data and heuristics – to help users develop a model of the process. The software continuously assesses current and predicted operational data, compares it to desired results and computes new control targets to reduce in-process variability and improve process performance.

The software features solution builder tools that enable users to build, maintain and adjust many models on their own without the need for outside support; web-based dashboards that leverage the latest Google web tools to provide a customisable, browser-based user experience; and an automatic step-tester, which makes the step-testing process easy, fast and adaptable to changing process conditions.

For more information, visit:
http://www.rockwellautomation.com/solutions/process/systems/advancedpc/

Integrated Architecture Tools: Accelerator Toolkits

**LISTEN.
THINK.
SOLVE:**

Speed up the engineering, software development and commissioning phases of your projects with help from Rockwell Automation Accelerator Toolkits. Toolkits provide templates for hardware drawings, sample code for your controllers and HMIs, as well as quick start manuals to show you how to put it all together. Download or order these DVDs from Rockwell Automation and experience how these tools can "accelerate" your projects.

*Available at **www.ab.com/go/iatools***

Allen-Bradley • *Rockwell Software*

Rockwell Automation

Studio 5000™ Automation Engineering and Design Environment

Version 21: Logix Designer

Studio 5000 software includes the Logix Designer application for the programming and configuration of Allen-Bradley ControlLogix 5570 and CompactLogix 5370 programmable automation controllers.

Maintaining the user-friendly workflows and interfaces of the RSLogix 5000 design and configuration software, Studio 5000 Logix Designer enables a new level of integration within the Integrated Architecture system by embedding features such as program comments and descriptions, and a new circular and permanent alarm log, directly in the controller. Storing all this information in the controller enables greater engineering collaboration, and helps ensure that alarm data will not be lost if there is a communication or network failure.

Studio 5000: The Future

Future versions of Studio 5000 will integrate additional applications into this one common framework to address engineering tasks, such as HMI development, library management for reusable components, information integration, and more.

Multiple capabilities included in one common environment will allow you to define data once and easily use it across the Integrated Architecture system, improving development efficiency and reducing programming errors. Additionally, this engineering and design environment will have the ability to communicate and perform at higher speeds, resulting in improved productivity, shorter

Rockwell Automation Boosts Allen-Bradley PowerFlex 755 Drives to 2,000 Horsepower

Rockwell Automation has extended the ratings of its Allen-Bradley PowerFlex 755 AC drives to 1500 kW/2,000 Hp, completing the power range of the PowerFlex 750-Series portfolio and providing customers with a wide selection of options and features. The high-power drive builds on the application flexibility and common user experience of the PowerFlex 750-Series, giving heavy industries a new option for advanced power control.

The PowerFlex 755 drive is well suited for a wide variety of applications ranging from simple variable speed and variable torque control to the most demanding systems requiring constant torque control.

The latest frame extension delivers the enhanced control capabilities of earlier high-power models, including features, such as 400/480/600/690 volt ratings and N-1 technology. With N-1 technology, users can configure the PowerFlex 755 high-power drive to utilize one, two or all three of its power structures. This gives the redundancy and advanced control needed to effectively manage load changes, protect equipment, and keep the drive up and running in the event of a power failure.

Like all PowerFlex 755 drives, the latest frame size includes an embedded Ethernet port and multiple option slots, so users can tailor the drive to their application. Option modules include I/O, feedback, safety, additional communications and auxiliary power supply. In addition, a convenient rollout design allows easy access to the drives for fast installation and maintenance. The drive's converter and control pod can remain in the unit while the inverter is rolled out, so control wiring can remain intact. The drive is suitable for standalone applications, and features a real-time clock that provides data-logging and enhanced diagnostics.

For more information, visit:
http://ab.rockwellautomation.com/Drives/PowerFlex-755

New Allen-Bradley Micro850 and Enhanced Micro830 Programmable Logic Controllers

To meet machine builders' needs for flexible micro programmable logic controllers (PLCs) that optimize stand-alone machine performance and cost, Rockwell Automation announces the new Allen-Bradley Micro850 and enhanced Micro830 PLCs. Both micro PLCs feature embedded motion capabilities for up to three axes of motion, allowing them to support a wide range of applications.

The Micro850 micro PLC is equipped with the same form factor, plug-in support, instruction/data size and motion capabilities as the 24-pt and 48-pt Micro830 controllers, but with the added capabilities of Ethernet and expansion I/O. The Micro850 controller specifically targets the needs of OEMs and excels at stand-alone machine applications.

The Micro850 controller has an embedded Ethernet port for higher performance connectivity to human-machine interfaces (HMIs). The EtherNet/IP protocol with CIP Symbolic support is used for simplified Allen-Bradley PanelView Component HMI connectivity. Tags created while configuring the HMI screens can easily reference the variable names in the Allen-Bradley Micro800 program.

For more information, visit:
http://ab.rockwellautomation.com/Programmable-Controllers/Micro800

VISIT ROCKWELL AUTOMATION AT THESE EVENTS: MARCH - MAY 2013
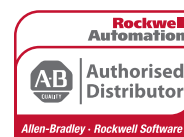
DATE	EVENT	LOCATION
5–6 March	Rockwell Automation On The Move	Auckland, New Zealand
13 March	Rockwell Automation On The Move	Christchurch, New Zealand
19 March	Rockwell Automation On Tour	Parramatta NSW, Australia
21 March	Rockwell Automation On Tour	Newcastle NSW, Australia
21 March	Mining Seminar	Newcastle NSW, Australia
9 April	Rockwell Automation On Tour	Brisbane QLD, Australia
15 April	China / Australia Mining Forum	Brisbane QLD, Australia
16 April	EtherNet/IP Seminar	Melbourne VIC, Australia
18 April	Rockwell Automation On Tour	Darwin NT, Australia
30 April	Rockwell Automation On Tour	Adelaide SA, Australia
7–10 May	AusPack 2013	Homebush NSW, Australia
14 May	Rockwell Automation On Tour	Perth WA, Australia
21 May	EtherNet/IP / Manufacturing Intelligence	Sydney NSW, Australia
28 May	EtherNet/IP / Manufacturing Intelligence	Brisbane QLD, Australia
29 May	IICA Table Top	Wollongong NSW, Australia