Batch System Upgrade Expands Process Flexibility

Automation Keeps the “Craft” in a Craft Brewery

Which Temperature Control Device Should You Use?
Since our origination as Alpha Gear in 1984, WITTENSTEIN alpha has set the bar for excellence in motion control systems—right from the heart of the Midwest. Today our North American headquarters sits on a six-acre campus in Illinois, where we exceed customer expectations daily:

• Ship more than 5,000 products each month, and average 99% on-time delivery.
• Deliver engineering and technical support that helps optimize application performance.
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The quality of WITTENSTEIN alpha gearheads is renowned. Today that quality is more accessible than ever. For providers near you, email info@wittenstein-us.com.
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Find out more about our complete level portfolio on www.yourlevelexperts.com/113ghz
Smart Machines Bring Plants to Life

Smart, secure, connected machines deliver production intelligence to increase productivity, improve flexibility and address safety risks.

FEATURES

Food Maker’s Batch System Upgrade Expands Process Flexibility
Learn how a scalable, standardized batch system helped bread maker increase production, improve batch consistency and reduce cycle times more than 20%.

How Automation Keeps the “Craft” in a Craft Brewery
Learn how Mother Earth Brew Co.’s new facility and automated control system maintains flexible, consistent production and boosts clean-in-place efficiency.

Incorporate Early Warning Devices into Motor-Driven Applications
Prevent equipment damage and unplanned downtime with current transducers that can provide advance warning that a motor might fail.

Which Temperature Control Device Should You Use?
Compare the operation of SCR power controllers to electromechanical contactors and solid-state relays for temperature control.

How NFPA 70E Sparks New Approaches to Electrical Safety
Standard drives technology developments that include risk-reduction tools and strategies for improved workplace safety and productivity.
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WEB-EXCLUSIVES

Visit www.rockwellautomation.com/thejournal to access these Web-only bonus articles!

Free On-Demand Webinar: The Basics of Wireless Controls in Industrial Automation
Learn about the past, present and future of industrial wireless applications. Also explore the three tenants of implementing industrial wireless: increased safety for workers and machines; mobility so employees can move around the facility; and efficiency that helps protect your brand, grow margins and improve performance.

Learn from how a packaging OEM fortified electrical safety and achieved Short-Circuit Current Rating NEC compliance by using compact circuit protectors applied to servo drives.
GREATER VISIBILITY. IT’S LIKE AN ACCELERATOR FOR BUSINESS SUCCESS.

Zebra gives you the big picture. In today’s data-centric world, real-time information is crucial for your business. And with hardware, talking to software, talking to the cloud, only Zebra’s intelligent, enterprise-level solutions give you the connectivity and unmatched visibility you need to manufacture success. See the vision at zebra.com/visibility
Growing up on a farm, I learned quickly to work smarter, not harder. Farmers today are working smarter by adapting new technology such as drones and software systems to help them better monitor their crops, track water usage and oversee livestock operations. Even tractors are smarter, coming equipped with GPS systems among a hoard of other software and hardware solutions to help deliver the highest possible yield.

Not only is technology making a farmer’s work more efficient, but teamwork also plays a vital role. Bailing hay, one of the hardest jobs there is on a farm, actually became enjoyable when everyone worked together as a team to devise new strategies to ease the back-breaking work. That teamwork is paramount in manufacturing operations, too, and by adapting an open mind to new ideas and new technology, your operations will only reap benefits.

As this month’s cover story highlights, smart, connected machines not only help improve operational challenges such as productivity and flexibility, but also address workforce challenges and safety risks. In this article, learn how OEMs are delivering smart packaging machines that help bring plants to life, connecting people, processes and technologies to improve collaboration and decision-making at all levels.

Smart manufacturing also helped breathe life into a craft brewery’s greenfield operation. In our food and beverage case study, Mother Earth Brew Co. expanded into a new facility and adopted an automated control system to maintain flexible, consistent production of the company’s vast collection of brew recipes. Read more about the installation process and how automation also helped boost the efficiency of non-brew operations.

From the field to the factory, smart machines are helping keep operations running smoothly, safely and securely. In this issue, we’ll help you learn how to embrace smart manufacturing, and much more.
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ROCKWELL AUTOMATION EARNS AWARD, JOINS INITIATIVE

CEO Blake Moret commits to accelerate diversity, inclusion and gender equality

Rockwell Automation president and CEO Blake Moret, along with the heads of 40 other leading global companies, has committed to being a member of Catalyst CEO Champions for Change to do more to drive change for gender equality in the workplace. The effort, developed by Catalyst, a global thought leader and partner in accelerating the progress of women at work for more than 50 years, recognizes CEOs and top industry leaders who support and drive diversity and inclusion within their organizations.

The Catalyst CEO Champions for Change initiative was celebrated at the 2017 Catalyst Awards Conference and Dinner in New York City, where Rockwell Automation was named the 2017 Catalyst Award winner for the company’s innovative organizational approaches that address the recruitment, development and advancement of women and have led to proven, measurable results.

The company began its Culture of Inclusion in 2007 with senior leaders renewing their commitment to diversity, inclusion and engagement. This was in response to employee data showing that women and people of color at the company had lower retention rates than white men, and there were gaps in the levels of representation for key demographics. A driving force of this strategy is the knowledge that to affect sustainable change, the dominant group — in this case, white men — must be aware of the impact of their privilege, be engaged, and partner with women and underrepresented groups in a meaningful way.

Results demonstrate that the Culture of Inclusion approach contributed to the advancement of women across businesses and functions at the company. Between 2008 and 2016, women’s representation at Rockwell Automation in the U.S. increased from 11% to 23% among vice presidents, from 14% to 23% among directors, and from 19% to 24% at the middle-manager level.

At the most senior leadership levels, women’s representation doubled, increasing from 11% to 25% among the CEO’s direct reports and from 11% to 20% on the board of directors. In addition, the Rockwell Automation voluntary turnover is well below the benchmark average for women.

“Change must start at the top, where leaders commit to measurable results and hold our teams accountable,” said Moret. “Through this program, Rockwell Automation and the other founding companies will drive a culture shift that advances gender equality in the workplace, where all employees can and want to do their best work every day.”

Catalyst CEO Champions for Change
www.catalyst.org/catalyst-ceo-champions-change

Rockwell Automation
www.rockwellautomation.com

“Through this program, Rockwell Automation and the other founding companies will drive a culture shift that advances gender equality in the workplace, where all employees can and want to do their best work every day,” said Rockwell Automation CEO Blake Moret.
Any budget, Any application.

AMCI's SMD Series integrated stepper motors take the drive and controller out of the cabinet and put them right on the motor, reducing wiring and system costs. Integration couldn’t be easier over EtherNet/IP.

The PLC-Based Advantage

All programming is done using Rockwell Automation Studio 5000® or RSLogix™ 500 software, letting you take advantage of our EDS files, AOI's, and in-house application support. Machine Builders, OEMs, and Systems Integrators can accelerate installation and programming time while improving overall effectiveness using SMD Series integrated motion solutions.

Features for Any Application

- **Encoder Options**
  Incremental or Absolute feedback for position verification

- **Embedded Switch**
  Dual-port design w/built-in Ethernet switch simplifies multi-axis installations

- **IP65/67**
  Optional IP65/67 rating is uniquely qualified for wash down applications

- **Virtual Axis Follower**
  Enable coordinated motion with any other servo/VFD axis on the PLC

Priced for Any Budget $$$$$

Prices start at $525/axis for everything you need to add high performance motion control to your Allen-Bradley PLC or PAC.
MESA ELECTS NEW BOARD MEMBERS

The Manufacturing Enterprise Solutions Association (MESA) International has announced new board members, several hailing from Rockwell Automation and its PartnerNetwork™.

Uwe Kueppers, Rockwell Automation, heads the EMEA (Europe, Middle East, Africa) Board.

Jim Toman, of Rockwell Automation Solution Partner Grantek (www.rockwellautomation.com/go/p-grantek), serves as vice chairman of MESA Americas Board of Directors. Board members at large include John Clemons from MAVERICK Technologies, a Rockwell Automation company (www.mavtechglobal); and Keith McPherson, Rockwell Automation.

Serving on the International Board of Directors is John Clemons, John Dyck, Khris Kammer, and Uwe Kueppers of Rockwell Automation, and Greg Millinger of MAVERICK Technologies.

Several Rockwell Automation PartnerNetwork members also join the International Board of Directors. They are: Mike Hitmar of SAS, a Rockwell Automation Encompass™ Product Partner (www.rockwellautomation.com/go/p-sas); Ananth Seshan of Encompass Partner 5G Automatika Ltd. (www.rockwellautomation.com/go/5g-automatika); and Ian Tooke of Rockwell Automation Solution Partner Grantek.

MESA International
www.mesa.org

BEST FUTURE MACHINE AWARD WINNER ANNOUNCED

Rockwell Automation has announced that the overall winner of its inaugural Best Future Machine Award is Italian company Cama Group (www.camagroup.com).

The competition, created to recognize and reward the high levels of innovation in the packaging industry, was split into five categories: ease of use, modular machines, smart machines, sustainability, and traceability and product safety.

The final shortlist and eventual winners were chosen by a judging panel comprising representatives from four international manufacturers: Johnson & Johnson, Proctor & Gamble, Kimberly Clark and Nestlé; and two major European trade associations: UCIMA and GEPIA.

Cama Group’s packaging machines and robotized lines — designed, manufactured and installed by the Italian company worldwide — can be used in food packaging and other industries. They cover the whole primary and secondary packaging processes, from the line entrance to the end-of-line packaging operations before palletizing.

The award-winning machine is the company’s IF318 robotized monoblock loading unit. Its features include cabinet-free technology, and the iTRAK™ intelligent track system from Rockwell Automation.

>> PartnerNetwork Brief
Polytron, Inc. Appoints CEO. Rockwell Automation Solution Partner Polytron, Inc., an engineering consultancy and systems integration firm based in Duluth, Georgia, has appointed Ronald Rich to CEO, following the retirement of Polytron founder, Charles Jager. As CEO, Rich will focus on connecting with customers and industries, setting vision and strategy for the organization, and strengthening the company’s culture and leadership team.

Polytron, Inc.
www.rockwellautomation.com/go/p-polytron

>> PartnerNetwork Brief
FANUC Designs Machining Training Simulator for Classrooms. Encompass™ Product Partner FANUC America has developed a new machining simulator that covers the complete manufacturing process from part design and engineering to CNC programming to virtual production simulation. The simulator features Autodesk Fusion 360 CAD/CAM/CAE software and a custom machining simulation program designed by ModuleWorks. Fusion 360 is free for students, start-ups, educators and hobbyists once they create an Autodesk account. Commercial users can sign up for a free one-year subscription through a special promotion with FANUC.

For more information, visit www.fanucamerica.com/cncsimulators.

FANUC America Corporation
www.rockwellautomation.com/go/p-fanuc

WEBSITE: www.rockwellautomation.com/themail
Cama rated highly in several categories and won best ease-of-use. The Cama machine showed how an integrated, modular design concept can be incredibly flexible and suit multiple applications.

Other category winners included:
- Modular Machines: Gebo Cermex for its modular CareSelect infeed system.
- Smart Machines: Goglio won with its GCap6 filling machine for aluminum capsules.
- Sustainability: CMC Machinery for its CartonPack box-on-demand solution that minimizes packaging waste.
- Traceability and Product Safety: SN Maschinenbau’s FM 200 pouch packaging machine’s communication capabilities was designed with Industrie 4.0 in mind and offers data-capture possibilities for traceability.

The winners were announced at a ceremony held at the interpack show. Cama will be given free flights and hotel accommodations to the Rockwell Automation Automation Fair® event, Nov. 15 and 16, at the George R. Brown Convention Center in Houston. While at the event, Cama representatives will have the opportunity to meet senior management teams and key industry personnel from the U.S.

Best Future Machine Award
www.rockwellautomation.com/global/go/futuremachine

ROCKWELL AUTOMATION EXPANDS PARTNER NETWORK PROGRAM
Rockwell Automation has grown its PartnerNetwork™ program with five new members and three regional expansions among existing member companies.

Ethisphere Institute has recognized Rockwell Automation as a 2017 World’s Most Ethical Company. This is the ninth time that the Ethisphere Institute, an organization that strives to define and advance the standards of ethical business practices, has named Rockwell Automation to the distinguished list of companies that influence and drive positive change, and improve ethical leadership and corporate behavior.

“Thank you to our 22,000 employees who have helped to ingrain ethics and integrity into our corporate DNA,” said Blake Moret, president and CEO, Rockwell Automation. “Our success is grounded in the people who choose to do the right thing, every day, as they enable more productive and competitive manufacturing environments.”

Rockwell Automation
www.rockwellautomation.com

ROCKWELL AUTOMATION NAMED A WORLD’S MOST ETHICAL COMPANY

The PartnerNetwork program helps industrial companies better solve their production and automation challenges by working with an expansive network of leading suppliers, distributors, system integrators, and machine and equipment builders.

In North America, three new companies have recently joined the Solution Partner program. Solution Partners are qualified system integrators that demonstrate the highest level of ability with Rockwell Automation technologies and relationships within their specialized services or solutions. The following companies are now Solution Partners for Rockwell Automation:

Avid Solutions, Winston Salem, North Carolina, specializes in process automation and information solutions for companies focused mainly on chemical, life sciences, power generation, and pulp and paper, with locations in both North America and Brazil. www.rockwellautomation.com/global/go/avidsolutions
Our partners, your success.
Distinguished system integrators who know your business.

Solution Partners, as part of our PartnerNetwork™ are comprised of system integrators with differentiated skills and experience in the areas of control, process, power and information. They can help design, implement, manage and maintain your automated systems and keep your facilities operating at optimum efficiency.

Put our advanced technologies together with the expertise of our Solution Partners, and you have a unique resource to call on.

AIA Automation, Inc.
Automated Control Concepts
Applied Control Engineering, Inc.
Bachelor Controls Inc.
Banks Integration Group
Barry-Wehmiller Design Group
Commerce Controls
Concept Systems Inc.
Cybertrol Engineering
E Technologies
Electro Design Engineering, Inc.

Elm Electrical Inc.
EN Engineering
ESE, Inc.
Grantek
Innovative Control Solutions
Interstates Control Systems Inc.
Javlyn, Inc.
JMP Engineering, Inc.
JNE Automation
Logical Systems, Inc.
Malisko Engineering
Matrix Technologies, Inc.
Melf
Millennium Control Systems Inc.
Outbound Technologies
Polytron, Inc.
PREMIER System Integrators, Inc.
Prime Controls
Pyramid Controls
Revere Control Systems, Inc.
River Consulting
RoviSys Company

Stellar Group
Stone Technologies
Systems Interface Inc.
Taurus Power and Controls
Technical Systems, Inc.
Thermo Systems
TriCore Inc.
Wachter Electric Company, Inc.
W-Industries, Inc.
Western Integrated Systems Ltd.
Zeplin-USA

For more information, go to:
www.rockwellautomation.com/go/tjsi
**Kice Industries Inc.**, Wichita, Kansas, focuses on the milling industry, primarily grain milling, along with wood, plastics and other consumer goods. Their electrical division offers full turnkey integration and consulting of complete milling systems from MES, control systems and power. [www.rockwellautomation.com/global/go/kice](http://www.rockwellautomation.com/global/go/kice)

**NorthWind Technical Services**, Sabetha, Kansas, provides process design and automation services, control panel fabrication and other engineering support services predominantly for the pet food industry. [www.rockwellautomation.com/global/go/northwind](http://www.rockwellautomation.com/global/go/northwind)

The Encompass Partner program is a product reference program that helps customers quickly locate products that solve their application challenges. These products complement, enhance and extend Rockwell Automation solutions. The program has two new members in the Americas region:

- **CBS ArcSafe, Inc.**, Denton, Texas, offers the SecureConnect remote operator for Allen-Bradley® Centerline® 2100 motor control.
EIPVR: EtherNet/IP™
PROCESS VIDEO RECORDER

SECOND GENERATION
ETHERNET/IP PROCESS VIDEO RECORDER

- supports up to 4 cameras recording simultaneously
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SAFETY EXCELLENCE AWARDS NOMINATIONS OPEN

For the fifth year, Rockwell Automation is accepting nominations for its Manufacturing Safety Excellence Awards. Each year, the awards celebrate best-in-class manufacturers that make safety an inherent value in their company culture, compliance procedures and use of machine-safety technology.

“Ideal candidates for these awards are companies demonstrating the vital role that safety has in improving overall productivity and operations,” said Mark Eitzman, safety market development manager, Rockwell Automation. “The 2016 winners — Dana Incorporated, MESNAC and OCME — showed strong leadership in their commitment to improving safety and productivity.”

Manufacturers, industrial producers, machine builders and system integrators are welcome to enter a

>> PartnerNetwork Brief
Bürkert Opens Huntersville Campus. Encompass™ Product Partner Bürkert Fluid Control Systems has officially inaugurated its new 173,000 square-foot U.S. headquarters in Huntersville, North Carolina. The company offers products for measuring and controlling liquids and gases. The new address is 11425 Mt. Holly-Huntersville Road, Huntersville, NC 28078.

Bürkert Fluid Control Systems
www.rockwellautomation.com/go/p-burkert

One existing Encompass Partner has expanded to the EMEA region:
RF IDeas, Rolling Meadows, Illinois, designs and manufactures card-based door access authentication and identification solutions for nondoor applications. www.rockwellautomation.com/go/p-rfideas

Two existing Encompass Partners have expanded to the Asia Pacific region:

MYNAH Technologies, Chesterfield, Missouri, provides dynamic simulation software for automation system software acceptance testing and operator training. www.rockwellautomation.com/go/p-mynah

Rockwell Automation PartnerNetwork Program
www.rockwellautomation.com/partners

>> PartnerNetwork Brief
FANUC CEO Joins AMT Board. Michael J. Cicco, president and CEO of Encompass™ Product Partner FANUC America Corporation, Rochester Hills, Mich., has been elected to a three-year term on the board of directors for The Association For Manufacturing Technology (AMT). AMT and its members represent and promote U.S.-based manufacturing technology.

FANUC America Corporation
www.rockwellautomation.com/go/p-fanuc

NEWS & NOTEWORTHY
NEW 8-Channel ControlLogix®
POWER MONITORING MODULE
Maximize energy efficiency and extend the life of your critical components by accurately monitoring power consumption.

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- Battery monitoring
- Industrial furnaces
- Material processing

The 1756-RMS-SC module helps ControlLogix® users maximize their bottom line by monitoring electricity consumption, load sizes, demand peaks and other utility concerns. With 8 highly isolated channel pairs, a user can monitor voltage and current from multiple inputs throughout the facility.

- 8 input channel pairs; one current and one voltage
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nomination form. Winners will be selected based on the three key pillars of a comprehensive safety program: a strong safety culture, well-executed compliance procedures, and effective use of current, machine-safety technology. These awards also recognize companies that seek to improve collaboration between engineering and EHS departments to help drive down injury rates while also improving productivity.

The 2017 winners will be announced in the fall and will join an esteemed group of past winners including Bevcorp, The Clorox Company, Corning Environmental Technologies, General Motors, The Goodyear Tire & Rubber Company, Kimberly-Clark Corporation, Paper Converting Machine Company (PCMC), Proctor & Gamble and PepsiCo Inc.

To nominate a company, download and complete the entry form (www.rockwellautomation.com/go/safetyaward) and email it to swludwig@ra.rockwell.com with “Safety Excellence Awards Nomination” in the subject line or mail it to the following address: Rockwell Automation, Attn: Steve Ludwig – Safety Excellence Awards, 1 Allen Bradley Drive, Mayfield Heights, OH 44124. The deadline for nominations is Aug. 18, 2017.

Manufacturing Safety Excellence Awards
www.rockwellautomation.com/go/safetyaward

MESA RECOGNIZES OUTSTANDING CONTRIBUTORS

The Manufacturing Enterprise Solutions Association (MESA) International announces the winners of its 2017 Outstanding Contribution to MESA Award. The annual

>> SPOTLIGHT
CORPORATE RESPONSIBILITY REPORT AVAILABLE

Rockwell Automation has announced its 2016 Corporate Responsibility Report is now available online and in print. Besides detailing the company’s approach to ethical business practices, the report provides highlights and updates on the company’s environmental performances, employee safety and culture, and community relations initiatives.

2016 Corporate Responsibility Report
www.rockwellautomation.com/go/tjreresponsibility
award was established in 2008 to recognize the effort and dedication of individuals whose personal contributions have greatly benefited the entire association.

This year, MESA presented the award to Uwe Kueppers of Rockwell Automation, Kempen, Germany, for his leadership as EMEA Board Chair. Ananth Seshan of Rockwell Automation Encompass™ Partner 5G Automatika Limited, Ottawa, Ontario, was recognized for his role as Asset Performance Management Working Group Chair and for advancing initiatives in India.

MESA International
www.mesa.org

>> PartnerNetwork Brief
Nook Industries Names New COO. Encompass™ Product Partner Nook Industries, a provider of linear motion components and systems, announced Jim Rowell as its new chief operations officer. Rowell oversees Nook’s leadership initiatives, driving operational strategy and supporting employee development. He has more than 25 years of industry experience. Prior to joining Nook, he held roles in Parker Hannifin’s Fluid Connectors and Automation groups as territory manager, product manager, business unit manager, manufacturing manager, general manager and vice president of operations.

Nook Industries, Inc.
www.rockwellautomation.com/go/nookindustries

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Manufacturers are eager to understand their operations better, improve productivity and keep up with competitive pressures. As a result, they expect their machine builders to deliver packaging machines that fill two primary purposes.

First, manufacturers want smart packaging machines that allow them to capitalize on the transformative potential of smart manufacturing. Smart machines are connected, Ethernet-enabled machines. They should deliver real-time diagnostics, use modern machine-safety technologies and be easy to integrate. They also should be designed with an eye to the future, with capacity to scale up to support additional connections and expansions.

Second, they want machines that can support increasingly high-performance packaging operations. This means helping them boost productivity to gain a competitive edge, as well as improving their operational flexibility to support expanded product varieties and more diverse packaging sizes. It also means helping address new productivity and worker-safety challenges that are arising from an evolving workforce.

Embracing Smart Machines
Smart, high-performing machines can help manufacturers improve their operations and address pressing business needs in several ways. Four key focus areas include improving productivity and efficiency, increasing flexibility, reducing design complexity and addressing workforce challenges.

Improving productivity and efficiency. One of the most essential ways to get more from packaging machinery systems is by connecting machines, sensors and devices and using intelligent software to improve control. Companies can also combine standardized machine functionality with standardized information reporting to drive continuous overall equipment effectiveness (OEE) improvements across multiple sites.

The greater connectivity available in a smart-manufacturing approach also creates completely new ways to improve productivity, such as remote monitoring. This can be used to oversee operations, perform real-time diagnostics and troubleshoot problems.

For example, Rockwell Automation OEM Partner Premier Tech Chronos (www.rockwellautomation.com/go/premiertech) offers a cloud-enabled, remote-monitoring solution for its packaging equipment. The solution can give operators and maintenance teams mobile access to machine statuses, and it allows for the sharing of diagnostic information. It even can provide the required part numbers, fulfill part orders and schedule maintenance if an issue arises.

Increasing flexibility. Expanding product portfolios and more diverse packaging sizes means that production runs are shorter and changeovers are more frequent. As a result, manufacturers need
It’s About Time

Time to Save
Time is money. Time saved in engineering can lower costs or be used to generate more revenue. Switching to EPLAN Electric P8 from CAD software typically reduces project time by 40% or more right out of the box – as much as 80% when using the feature-rich EPLAN portfolio to its fullest.

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EPLAN provides direct access to over 33,000 certified Allen-Bradley parts from right within our software using the EPLAN Data Portal. We also provide bi-directional synchronization with Studio 5000 Logix Designer® through Studio 5000 Architect™ to ensure that data integrity is preserved throughout the design and programming of automation systems.

Several Encompass™ Product Partner companies in the Rockwell Automation PartnerNetwork™ (www.rockwellautomation.com/partners) provide capabilities that support machine connectivity. Visit their websites to learn more about how they can help you.

**PartnerNetwork**

**Ethernet Remote Access**
HMS Industrial Networks AB
www.rockwellautomation.com/go/p-hms

ProSoft Technology
www.rockwellautomation.com/go/p-prosoft

Spectrum Controls
www.rockwellautomation.com/go/p-spectrum

**Robotics – Networked**
DENSO Robotics
www.rockwellautomation.com/go/p-denso

FANUC
www.rockwellautomation.com/go/p-fanuc

**Robotics – Logix Integrated**
Codian
www.rockwellautomation.com/go/p-codian

KUKA Robotics Corporation
www.rockwellautomation.com/go/p-kuka

Weiss North America Inc.
www.rockwellautomation.com/go/p-weiss

Helm Instrument Co. Inc.
www.rockwellautomation.com/go/p-helm

Mettler-Toledo, LLC.
www.rockwellautomation.com/go/p-mettler

Rice Lake Weighing Systems
www.rockwellautomation.com/go/p-rice

Schenck Process LLC
www.rockwellautomation.com/go/p-schenck

VPG – BLH Nobel
www.rockwellautomation.com/go/vpg

**Weighing Instruments**
Hardy Process Solutions
www.rockwellautomation.com/go/p-hardy

**Friedhelm LOH Group**

**Engineering Software**
greater flexibility in their machines to minimize change-over times and ultimately maximize throughputs.

Traditional motor solutions that use rotary-driven chains, belts and gears can be rigid, with complex designs and little flexibility. New machine solutions often can meet modern production needs better.

An intelligent track system, for example, is a scalable, motion-control system that provides independent control of magnetically propelled movers on a track. It replaces traditional mechanics with simple software profiles, which can improve speed and flexibility in a diverse range of packaging applications.

Rockwell Automation OEM Partner and food and beverage packaging machine builder Delkor Systems (www.rockwellautomation.com/go/p-delkor) uses an intelligent track system on its HSP-400 case packaging system for flexible pouches. The system’s independent control of product movers allows the HSP-400 to reach three times the average speed of other case packers with precision, says the company.

Reducing design complexity. Incorporating smart devices from multiple equipment manufacturers can lead to challenges in getting those devices to communicate and operate in concert with each other. This can increase engineering time and costs during machine design and commissioning and create maintenance challenges in the future.

Improved controller-device integration helps address these challenges. Premier Integration from Rockwell Automation is a unique capability that consolidates controller programming, device configuration and machine-operation and maintenance activities into a single software environment. Premier Integration is made possible by using the latest intelligent devices in a Logix-based control architecture.

During integration, the Logix-based controller can recognize and retrieve the profiles of other Logix-based devices automatically. The engineer selects the specific device module, and the software pulls in all of the device’s parameters. This can reduce substantial time engineers spend poring through device manuals to identify the meaning of parameter fields in the control-system software.

Library management is another capability in Premier Integration. It allows packaging machine builders to store, manage and reuse code from their programs. This can help them reduce development time and build on the outcomes of their successful projects.

Addressing workforce challenges. The global manufacturing workforce is in the midst of a massive transition. Skilled worker shortages have emerged as a threat to growth and productivity in multiple regions around the world. To help manufacturers cope with these challenges, packaging machines should be designed for easy use by newer and experienced workers, while also optimizing worker safety and productivity.

Contemporary machine safety systems can help reduce safety risks and improve productivity. These safety systems...
are integrated with machinery-control systems and are less prone to nuisance shutdowns than hardwired systems. They also are more ergonomic, reducing the probability that workers will override the systems and put themselves at risk.

Additionally, human machine interface (HMI) faceplates with systemwide diagnostics and easy-to-understand display screens can help younger, less experienced workers detect issues and ease troubleshooting. Embedded help functions and user manuals also can help improve machine familiarity.

Design Considerations

Achieving the desired levels of connectivity and performance are essential to a smart machine's design.

At the network level, the machine should be able to communicate in real time across an Internet Protocol (IP)-based, standard and unmodified Ethernet network infrastructure. For example, EtherNet/IP™ supports a simple network architecture, with the ability to handle discrete, continuous process, batch, safety, drive and motion applications.

At the system level, the machine should use the latest integrated control and information technologies. These technologies are well-suited for smart machines because they offer increased performance, easier access to information and reduced machine complexity.

New compact controllers provide up to 20% increased application capacity to support the growing demands of smart manufacturing. New I/O modules also offer two 1-gigabit Ethernet ports for faster scanning and for connecting up to 31 modules without the need to expand.

Security also is essential in a smart machine. More connections present more opportunities for security threats, whether they’re physical or electronic, malicious or unintentional, remote or onsite.

Smart packaging machines should follow a defense-in-depth (DiD) security approach to help protect intellectual property, safeguard operations and secure remote-access connections. DiD security is based on the idea that any one point of protection can and likely will be defeated. It uses a combination of physical, electronic and procedural safeguards to establish multiple layers of protection.

Smart Manufacturing Comes to Life

Smart manufacturing is transformative. It helps connect people, processes and technologies to improve collaboration and decision-making at all levels. It can replace laborious, manual data collection with automated data collection to save time and reduce the risk of human error. It can use production intelligence to increase productivity, improve quality and address safety risks.

Machine builders are central to making all of this possible in packaging operations with smart, secure, high-performing and Ethernet-enabled machines.

Rockwell Automation Smart Machines
www.rockwellautomation.com/global/go/smartmachines

Rockwell Automation OEM Partners
www.rockwellautomation.com/go/tjoem
FOOD MAKER’S BATCH SYSTEM UPGRADE EXPANDS PROCESS FLEXIBILITY

Learn how a scalable, standardized batch system helped bread maker increase production, improve batch consistency and reduce cycle times more than 20%.

Bread is on nearly every restaurant menu. Sandwich makers, for instance, roll through millions of cases of bread each year. Behind the scenes, industrial food manufacturers, such as Tolleson, Arizona-based Southwest Baking Company produce more than 2-million cases of bread annually to keep sandwich makers and other restaurants in business.

Southwest Baking’s bread-making process begins in raw material receiving, where ingredients such as flour, yeast and salt are stored in holding bins until transferred into the batching system. The batching system draws the raw materials from the holding bins into an industrial mixer where ingredients are combined. The mixture then moves into production where the bread product is formed and frozen before being packaged, palletized and shipped to distribution centers.

Limited to an outdated, proprietary batch system, Southwest Baking could run only one batch every eight minutes. This kept the factory at only 85 to 90% capacity, based on the machinery’s production power. To meet growing demand, the company required an intuitive solution for improved flexibility.

Batch Challenges
Adding to their growth restrictions, the company was experiencing five to six hours of downtime per month at a
cost of thousands of dollars per hour. Sometimes a downtime event would last up to a full day or more while a lone programmer tried to fix the problem.

“When the programmer left the company, knowledge of the system left with him,” says Robert Wroblewski, plant engineer, Southwest Baking. “Our employees didn’t know how to operate [it], leaving us to wait hours for outside support when issues occurred.”

The proprietary platform wasn’t scalable, so Southwest Baking couldn’t expand process lines for future growth. “Beyond scalability, we’d continuously run into situations when new equipment needed to be added or the procedures in our batch process had changed, causing us valuable time reprogramming, starting up and testing before run time,” Wroblewski adds.

In addition, the company’s outdated platform had limited reporting capabilities. Reports were restricted to pulling in data from raw materials receiving and were not accurate or collected consistently. Operators had to gather the data manually at various intervals in the process, leaving room for human error. The system also could store only a few days of data.

Southwest Baking required an easily supported batch solution that was sustainable over the long term and that could track and report critical process data accurately.

**Standardized Solution**

Southwest Baking collaborated with ECS Solutions Inc. (http://ecssolutions.com) a Recognized System Integrator in the Rockwell Automation PartnerNetwork™ program, (www.rockwellautomation.com/partners) to help design and implement a replacement for the limited legacy system.

After assessing a number of vendors, Southwest Baking and ECS Solutions chose to standardize on a flexible batch recipe management system using FactoryTalk® Batch software (www.rockwellautomation.com/global/factorytalk-batch) from Rockwell Automation (Figure 1). The company upgraded its control system to Allen-Bradley® ControlLogix® controllers (www.rockwellautomation.com/go/tjcontrollogix) with an advanced HMI interface and process historian.

“With the new system, we can finally add, change or expand processes as needed,” explains Wroblewski. “Our improved flexibility and the associated cost savings alone helped pay for the system in just one year.”

In addition, the new system complies with S88 standards, allowing operators to make modifications to batch procedures and changes to controller codes more easily.

Enhancing operator functionality, the updated platform lets operators perform maintenance and troubleshooting without tapping outside programmers. Intuitive displays make the system easy to operate and increase insight to the full batch process.

As part of the new solution, Southwest Baking now has a visualization, analysis and reporting portal, allowing operators to view batch process trends — such as material
usage, balance of ingredients and delivery accuracy — and make adjustments to recipes easily when needed (Figure 2). The new historian collects almost 200 data points and can store years of data.

A Real Breadwinner
Southwest Baking wanted a reliable system with local support to help increase batch consistency across the facility. The company not only achieved this goal, but exceeded it. Since implementing the new batch solution, Southwest Baking increased production by 5% — approximately 10 lb. of dough per minute and an additional 400,000 cases of bread per year.

In addition, the company reduced its cycle time by more than 20%, meaning it can run more batches in the same time frame. “With our old system, we were running eight batches every hour. We now run 10 batches an hour,” says Wroblewski.

Downtime is almost a thing of the past. Southwest Baking has reduced downtime from an average of one hour of downtime per event to a couple of minutes of downtime per event.

The new batch system empowers operators at the plant level to respond to system errors when they arise. “Our operators are now the first responders at our facility,” says Wroblewski. “They understand the software and have direct insight into the process. In fact, nine times out of 10, they know how to fix the issue themselves — and if they don’t, local support is a phone call away.”

Additionally, the improved information and reporting accuracy helps the company maintain consistent recipes and reduce the amount of wasted ingredients.

Southwest Baking no longer is limited in flexibility. The scalability of the batch platform allows for additional process lines to be integrated easily and the overall baking process to grow with the company.

Rockwell Automation Food & Beverage Solutions
www.rockwellautomation.com/global/industries/food-beverage
San Diego, California-based Mother Earth Brew Co. (www.motherearthbrewco.com) started in a small garage and grew to a tap house to a production facility in just six years. In 2016, the company’s growth called for an additional production site.

Mother Earth’s executives chose a new 40,000-sq-ft space near Boise, Idaho, with a 50-bbl, four-tank craft brewery, and engaged Paul Mueller Co. to engineer the process, brewhouse and piping and Rockwell Automation Solution Partner Stone Technologies Inc. (www.rockwellautomation.com/go/p-stone) to provide the automation. The goal was to design a new facility that could maintain the flexibility needed to uphold and expand the company’s eclectic collection of craft labels. Chris Baker, head brewer at Mother Earth Brewing Co., oversaw the project.

Baker and Ryan Williams, project manager, Stone Technologies Inc., shared their experience and lessons learned from the greenfield installation at the 2016 Process Solution User Group (PSUG) conference held in November in Atlanta.

Along with recipe flexibility, the automation system handles energy recovery, process-value-dependent routines and an innovative approach to clean-in-place (CIP). The controlled equipment includes:

• a mash mixer to mix crushed grain and water under controlled pH and temperature;
• a lauter tun, where grain and liquid wort are separated and solids are extracted using a rake mechanism;
• a brew kettle to boil, concentrate and sterilize the wort and to add hops;
• a whirlpool filter to further separate solids and deliver cool wort;

Learn how Mother Earth Brew Co.’s new facility and automated control system maintains flexible, consistent production and boosts clean-in-place efficiency.
• fermenters, where temperature is controlled closely to prevent off flavors;
• a centrifuge with a 10-micron lenticular filter to clarify the brew;
• and “bright beer” storage before carbonation and packaging.

The system has to handle a variety of recipes. “We typically brew seven varieties of beer in a given week, and 60 or 70 varieties over the course of a year,” Baker says.

Reliable, Repeatable and Flexible

“Automation makes craft beer reliable and repeatable — you’re not dragging hoses around — while providing the knobs brewers need to twist to keep it craft,” explains Williams, project manager, Stone Technologies Inc.. With that flexibility, the system had to allow for expansion and handle several non-brewing capabilities, all with “an information-driven interface for non-technical users,” he adds.

The PlantPAx®-based system from Rockwell Automation (www.rockwellautomation.com/go/plantpax6) uses Sequencer Object for sequencing control, Batch Scheduler for scheduling and starting times and separate parameter values for non-brew operations including CIP. “The CIP sequences use the same Sequencer Object instruction as the brew process, since all the control functions are the same,” Williams notes.

Instead of a separate CIP skid, the system “uses the vessels themselves as washing machines,” Williams explains. “The process equipment has cycles to clean one, trigger the next, add caustic, etc. They can clean all four circuits at one time, which they couldn’t do with a CIP skid.”

Approximately 50 parameters are associated with the equipment, and about 50 variables can be used as recipe parameters, including CIP. “These are the ‘knobs’ they can turn to get the taste and characteristics they’re looking for,” says Williams.

“The displays are a compromise of grayscale for situational awareness, and color they wanted to make them happy,” Williams adds. “ Sequencer Object gives a very good, in-depth visual of sequencing, a powerful addition to the PlantPAs library.”

An Allen-Bradley® ControlLogix L72 processor (www.rockwellautomation.com/go/tjcontrollogix) and FactoryTalk View SE (www.rockwellautomation.com/global/go/factorytalkse) HMI software from Rockwell Automation allow for expansion. “The kettle is the bottleneck now, and they might add another, with more pumps and valves,” Williams says.

Lessons Learned

Lessons from the project include involving the customer early and thoroughly. “Chris was involved from the beginning, in the process of functional spec creation and through factory acceptance test (FAT), checkout, water batching and commissioning,” Williams says. This resulted in very fast customer ownership.

“PlantPAx provides an excellent interface with users, allowing them to control a process without a need to understand PLC programming,” Williams continues. “And our use of development tools such as Excel creates a consistent and structured program.”

In the end, “No matter how much planning is done and how many meetings take place around the functional spec, there are always modifications needed and requested during startup,” Williams says. “Sequencer Object and PlantPAx make those modifications very quick, often with no need to open a PLC program.”

Stone Technologies, a Rockwell Automation Solution Partner, is a national systems integrator based in St. Louis focusing on consumer products, life sciences, and fine chemical industries. The company provides operations consulting, MES/MOM and process control design, development and implementation for smart manufacturing solutions.

Stone Technologies
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Rockwell Automation Food and Beverage Solutions
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Teledyne DALSA Industrial Products is committed to helping manufacturers improve product quality, lower costs and increase production with easy-to-deploy, cost-effective machine vision solutions for factory floor deployment.

“Our BOA products offer customers a compact industrial solution with diverse applicability across all manufacturing segments. We designed these products for quick set-up and easy integration to existing lines, such as attaching to the end of a robot arm,” says Steve Geraghty, vice president, Industrial Vision Solutions at Teledyne DALSA.

Headquartered in Billerica, Massachusetts, Teledyne DALSA Industrial Products is a participating Rockwell Automation Encompass™ Program Partner and manufacturer of highly integrated vision systems, simple and affordable vision sensors and innovative machine vision software for industrial applications. Products are used across industries including automotive, food and beverage, electronics, health and beauty, medical devices, packaging, pharmaceutical and semiconductor manufacturing.

A participating Encompass Partner since 2007, Teledyne DALSA’s vision solutions are designed to integrate seamlessly with Rockwell Automation devices. In the Encompass program, the company offers BOA products, highly integrated vision systems specifically designed for industrial use.

“Teledyne DALSA is committed to providing Rockwell Automation customers with best-in-industry product solutions, application expertise and global support,” notes Geraghty.

BOA vision systems are packaged as an industrial smart camera in a small, rugged enclosure that fits easily into existing production lines. Unlike traditional smart cameras, BOA incorporates multiple processing technologies — DSP, CPU and FPGA — for algorithm, communication and control optimization. BOA products are available in a range of resolution for monochrome and color applications and are configured through a web browser via a standard Ethernet interface.

They’re EtherNet/IP™ conformance tested and include protocols for interfacing with Rockwell Automation PLCs and HMs. Physical interfaces include Gigabit Ethernet, RS-232 serial, and opto-isolated inputs and outputs, all of which can be connected using standard M12 factory cables. A DIN-mountable breakout module simplifies control-panel wiring.

“We continue to develop products to satisfy the broad variety of customer requirements. These include single 640 x 480 standard camera configurations to high performance multi-camera models with 4,096 x 3,072 color resolution. Our BOA products are offered in small, rugged enclosures making them easy to integrate into tight-fitting applications or harsh factory environments knowing the heat, vibration or moisture will not affect performance.” Geraghty concludes.

Teledyne DALSA supplies digital imaging components for the machine vision market. Its image sensors, cameras, smart cameras, vision systems, frame grabbers, and software are used in automated inspection systems across many industries and applications.

For more information, visit www.rockwellautomation.com/go/p-teledyne-dalsa.
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Only 14% of manufacturers have integrated plant floor information to the enterprise*
Motors are used everywhere in industrial automation applications. Various means are available to determine whether a motor is running, such as an indicator light connected to the motor power input. However, knowing that a motor is operating optimally, and within specifications, requires a different approach.

Motors have shaft bearings, and those bearings will wear over time. The source of a motor failure, such as bearing wear, can be used to provide an early warning of impending failure. A current transducer can help prevent equipment damage and unplanned downtime by providing advanced warning that a motor might fail.

Early Warning Methods

Years ago, in the hard coal mining industry, long before gas detection devices were available, miners would carry a canary deep into the coal mines with them. They would keep an eye on the canary to determine whether harmful gases such as carbon monoxide were present in the mine. If the canary collapsed, it was the miners’ early warning to evacuate the mine shaft until the source of the toxic gas could be located and eliminated before they, too, fell victim.

A current transducer can be used in much the same manner as the canary once was. They can be used to create an early warning that then can be used to investigate a potential problem’s source well before a catastrophic event occurs. Think of it as an “electronic canary in a coal mine.”

As motor bearings wear, the motor will work harder to overcome the increased resistance associated with shaft bearing wear. The effect of increased resistance is reflected in the current a motor is drawing. As the bearings wear, the motor current draw will increase proportionally. A current transducer installed on one conductor of an AC motor can be used to monitor the motor’s current draw. The current transducer’s analog output can be connected to a programmable logic controller’s (PLC’s) analog input card. The PLC can in turn be programmed to issue an alert or sound an alarm when the motor current exceeds the motor current draw associated with an optimally functioning process.

Incorporate Early Warning Devices into Motor-Driven Applications

Prevent equipment damage and unplanned downtime with current transducers that can provide advance warning that a motor might fail.

By Ron Rapczynski, director of business development, NK Technologies
More than Just Motor Damage
The value of monitoring motor current should not be underestimated. Losing a motor may seem to be inconsequential. However, the motor expense itself often can be the least costly piece of equipment when the process the motor operates is damaged. Instead, the $10,000 spindle connected to the motor shaft may be a more expensive problem if the motor seizures up. The same is true of raw material the process is consuming. If the motor fails, the associated loss in process raw materials and production often can exceed the motor cost by many orders of magnitude.

Current transducers are the preferred device to monitor for motor bearing wear. For instance, when connected to a PLC, a variable frequency device (VFD) motor’s nominal operating current needs profiled to determine the upper control limit. With that known, and assuming the VFD motor is properly sized horsepower-wise, the excessive current alert level in the PLC can then be accurately programmed.

Predictive Maintenance and Planning
Keeping an operation that uses motors running 24/7 can be a formidable challenge. However, with a little forethought and predictive maintenance devices, you can control your process versus it controlling you. Usually if something catastrophic is going to happen, it will occur at the least desirable time. Just like a canary alerted miners long ago, current transducers can alert you to potential motor failure before it happens.

Encompass™ Product Partner NK Technologies develops and manufactures current and voltage sensing transducers and ground fault detection products for the industrial and factory automation markets.

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Editor's Note: This article is adapted from the whitepaper, "Top Advantages of SCR Power Controllers Over Contactors and Solid-State Relays," from Advanced Energy. Download the free, comprehensive white paper at https://goo.gl/Lpv6oz, to get in-depth information comparing electromechanical contactors and solid-state relays to SCR power controllers operating in a similar on-off manner. It includes details about on-off cycling, utility cost reduction, control accuracy, heater lifetime, cost-efficiency, noise and transient resistance and diagnostics.

Electricity can be controlled by a variety of switching devices. This article compares SCR power controllers to electromechanical contactors and solid-state relays (SSRs) operating in a similar on-off manner to regulate temperature.

An electromechanical contactor is a device that opens or closes a contact, allowing electricity to be switched fully on and fully off. An electrical control signal triggers the opening or closing of the contact or contacts.

In general, an electromechanical contactor is rated for a specific number of on-off cycles while in operation throughout its lifetime. This rating depends on the manufacturer and typically ranges from less than a million cycles at rated current and voltage to a few million cycles at rated current and voltage.

For a process cycle time of 30 seconds, a mechanical contactor performs 829,440 on-off cycles per year. At a process cycle time of 10 seconds, a mechanical contactor performs 2,488,320 on-off cycles per year. Based on the manufacturer's recommendation, the electromechanical contactor electrical contacts should be inspected and cleaned, and possibly repaired or replaced, after reaching the specified number of on-off operations.

A solid-state relay (SSR) is an electronic switch that operates without an electromechanical relay’s moving parts. Because it does not have moving parts, the SSR's life expectancy is greater. Typical cycle times are 2 to 5 seconds for reasonable SSR life.
The SSR can operate at a faster cycle (on-off) time than a comparable mechanical contactor. However, the SSR has a higher contact resistance and is susceptible to damage from surge currents. It also has limited switching arrangements compared to an electromechanical contactor (typically a SPST contact).

The **SCR power control module** is designed to switch the power applied to its output load quickly. Typical cycle times are 1 second, which means that the SCR will perform 24,883,200 operations in a year for the conditions stated.

The chart compares the calculated total quantity of cycles of operation for the electromechanical relay, the SSR and the SCR over 48 weeks, operating six days per week.

### On and Off Cycling During Typical Operation

The electromechanical contactor and SSR both switch electricity to a load when signaled to do so. This means that both devices can turn the electrical power to the output load on and off at any point in a sinusoidal wave.

In the United States, electricity is provided at 60 cycles per second, or 60 Hz. When the power supplied to a device doesn’t turn on or off at a zero crossover point in the sinusoidal waveform, voltage spikes occur on the sine wave, and radio frequency interference (RFI) and harmonics are generated. An arc also may occur with this type of random on and off operation.

The contactor and SSR devices operate efficiently (no disturbances when fully turned on or off). However, under normal process operating conditions, the generated harmonics can cause the sine wave provided by the power company to become distorted. This may cause difficulty for the power company’s measurement equipment, making it appear that the measured or required power is greater than the actual power used. This could increase power costs.

An SCR power control module is an electronic semiconductor device designed to regulate the power to an output load efficiently. It can switch the power applied to an output load in milliseconds.

Zero-cross operating mode allows SCRs to function comparably to contactors and SSRs, which operate by turning power fully on and fully off. However, in zero-cross mode, the SCR turns the output on and off at the zero-cross point in the sinusoidal wave, which gets rid of the potential RFI, harmonics and arcing associated with contactors and SSRs. These features make SCR power control module use suitable for electric thermal heating applications, for example.

### Assess Your Needs

Assessing the pros and cons of each type of device to determine suitability for a particular application can help optimize thermal control and output in temperature-critical processes.

*Advanced Energy, Inc. is a participating Encompass™ Product Partner in the Rockwell Automation Partner Network™. Based in Fort Collins, Colorado, Advanced Energy provides power and control technologies, including power control modules, for high-growth, precision power conversion solutions.*

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**Register to download the free, complete white paper, “Top Advantages of SCR Power Controllers Over Contactors and Solid-State Relays,” at https://goo.gl/Lpv6o2. The paper provides in-depth information comparing electromechanical contactors and solid-state relays to SCR power controllers operating in a similar on-off manner. It includes details about on-off cycling, utility cost reduction, control accuracy, heater lifetime, cost-efficiency, noise and transient resistance, diagnostics and more.**

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**Cycles Per Year**

<table>
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<tr>
<td>Contact</td>
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</tr>
<tr>
<td>SSR</td>
<td>2,488,320</td>
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<tr>
<td>SCR</td>
<td>24,883,200</td>
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This chart shows a comparison of total cycles of operation depending on device.
Safety is the reduction of risk, not the absence of risk. This risk reduction defines true safety innovation. In 1979, the National Fire Protection Association (NFPA) published its first edition of NFPA® 70E to address the growing number of electrical shock injuries and fatalities. Over the years, NFPA 70E has developed a track record of minimizing incident energy in power distribution systems, thus reducing arc-flash and shock injuries.

The organization continues to further improve safety; the 2000 edition included quantifying the poorly understood physics of arc-flash incident energy and began to define methods and procedures for reducing risks to workers. A recent study showed that 57% of facilities reported noticeable safety improvements following their implementation of an NFPA 70E electrical safety program.

The upcoming NFPA 70E 2018 edition aims to further enhance electrical safety in the workplace. Its emphasis on risk management will continue to drive electrical safety innovation and keep the floodgates open for better risk reduction in the future.

Standard Sparks Innovation

Since 2000, NFPA 70E has inspired almost two decades of rapid-fire innovations, including arc-rated equipment, smarter circuit breakers, arc-flash software tools and innovative training techniques. Each innovation has contributed to electrical safety risk reduction. Safety innovations can move the risk-reduction needle only if they rest solely on the unchanging principles of electrical safety. Here are some ways NFPA 70E has contributed to worker safety through new standards and advances in technology.

**Energized Electrical Work Permit.** The inclusion of the live work permit in the 2004 NFPA 70E, for the most part, eliminated high-risk live work tasks. Getting an approved live work permit requires a full job risk analysis, a job plan and approval of several layers of management.

Most often, the high risk associated with live work is deemed unacceptable and can wait until the system is de-energized. The result is better planning and a more robust predictive maintenance program to avoid unplanned shutdowns.

**Incident Energy Mitigation.** Before NFPA 70E, power system designs focused primarily on short-circuit coordination. Now these designs include incident energy values for the system, which helps facility engineers “pre-engineer” out the risk of arc flash. NFPA 70E also inspired the development of the arc-flash relay that reduces the intensity and damage caused during arc incidents.

Another new technology finds hot spots in electrical equipment before they can cascade into arc flashes. Hot spots within electrical equipment should be found early, especially when located on a bus with high incident energy.
and this early detection can help to prevent catastrophic equipment failures. One solution deploys a nonconductive light-based technology continuously to monitor potential hot spot locations within electrical equipment.

This hot spot monitoring technology is immune to voltage and allows sensors to be bolted directly to the bus-bar or potential failure point. Infrared thermography provides a similar functionality but is only a snapshot in time with a limited ability to direct and impact day-to-day maintenance activities. Partially loaded conditions during scanning can affect infrared reading accuracy. Additionally, many of these inspections are performed with the equipment doors open, which exposes workers to the risk of arc flash.

Safety by Design

The concept of permanent electrical voltage testers installed into electrical panels is a true safety-by-design innovation.

Fundamental to mechanical lockout/tagout (LOTO) is the bump test. The U.S. Occupational Safety and Health Administration (OSHA) requires this test to make sure all energy sources are in a safe state. However, many technicians began mistrusting the bump test because of sophisticated control and machine safety systems, so in most cases it was rendered irrelevant and ineffective.

To address this, voltage indicators installed on the load side of isolators provide a simple way for frontline workers to see firsthand that electrical energy is off. By opening the isolator, the voltage indicator changes state (illumination to no illumination), which helps determine that the right isolator is open and that there is a low residual risk of the electrical energy causing hazardous motion.

In addition, NFPA 70E determined that opening electrical panels was risky, so a simple voltmeter test for electrical isolation in mechanical LOTO wasn’t practical and added more, not less, risk. The end result — workers were more productive and reported saving an average of 13 min. per LOTO.

Voltage indicators installed on isolators brought an unexpected safety dividend to electrical LOTO. Voltage indicators essentially engineer out risk by increasing the likelihood that workers are exposed to zero voltage when performing the OSHA-required absence-of-voltage voltmeter test on the disconnect switch after opening the enclosure. The reliability record of voltage indicators, coupled with the statistical improbability of a combined, simultaneous failure of both the voltage indicator and isolator have made their use widespread within many facilities.

The Voltmeter Test

Will permanent voltage testing instruments ever supersede the practice of test-before-touch by qualified electrical workers? Ironically, this practice doesn’t diminish the voltmeter’s importance in LOTO but rather elevates it in becoming the worker’s personal electrical safety tool.

For certain occupations such as pilots, high-rise window washers or electricians, safety failures may result in death. In these workplace scenarios, workers personally verify proper equipment operation and suitability before starting their work tasks: pilots don’t fly unless they perform a thorough preflight check, and electricians never touch conductors without checking for voltage with their voltmeters. Therefore, the voltmeter test always will be a nonnegotiable safety step before an electrician works on conductors.

New Technology and Safety Fundamentals

Technology will continue playing a role in providing novel risk-reduction tools and strategies resulting in more safety and productivity for employees working on and around electrical energy. However, fundamental electrical safety principles, such as test-before-touching electrical conductors, will remain intact for some time. Future innovations eventually will rewrite the rules of electrical safety, but until then some safeguards will stay the same.

Encompass™ Product Partner Grace Engineered Products, Inc. provides personnel safety products including programming interface ports for controllers, SafeSide permanent electrical safety devices and IR viewing windows.

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AMF ADDRESSES BAKERY EQUIPMENT
SAFETY AND SANITATION

OEM’s sanitary direct-drive mixer reduces mixing time, provides safer operation and facilitates more efficient washdowns.

Take a walk down any grocery store aisle and the sheer variety of food products lining the shelves is mind boggling. Today’s consumers demand choice — and food producers oblige with selections that accommodate a range of flavor preferences, portion options, dietary requirements and additive restrictions.

This drive for versatility has a direct impact on machine builders challenged to develop efficient, agile equipment for an ever expanding range of ingredients and processing parameters.

“No doubt, our dough mixing equipment must quickly changeover from one formulation to the next,” says Alain Lemieux, director of engineering for dough systems, AMF Bakery Systems (www.rockwellautomation.com/go/p-amf). “But even more important, our machinery must address increasing safety and sanitation requirements.”

A Markel Food Group company, AMF Bakery Systems manufactures high-speed bread, bun and soft roll machinery and provides complete automated bakery solutions and engineering expertise. Headquartered in Richmond, Virginia, the company has a global customer base that includes some of the world’s largest commercial bakeries.

Backed by more than 50 years of experience in mixing innovation, AMF recently entered a new market segment with the introduction of the Specialty Sigma Arm mixer.

This sanitary direct-drive mixer can accommodate a variety of dough types for cookies, crackers, buttermilk biscuits and specialty snacks. The machine has a mixing capacity of 250 to 1,000 lb.

“Compared to many machines on the market, our Sigma Arm mixer offers significant design benefits —
especially from the standpoint of efficiency, operator safety and equipment sanitation,” Lemieux explains. “The key is a less complex, more open design — and a fully integrated control system.”

The new design includes a fully enclosed bowl tilt system. The simple, mechanical tilting mechanism allows a 180° forward tilt to discharge the dough once mixing is complete.

“The better the tilt angle, the faster and more efficiently the dough is released from the bowl,” Lemieux notes.

Typically, the dough is released to an AMF complete dough transfer system before moving on to portioning equipment and other downstream processes.

“The complete forward tilt of the bowl — along with the tubular, open-frame design — allows for easier washdowns and significantly reduces equipment sanitation time,” Lemieux adds.

To enhance operator safety, the Sigma Arm mixer includes two-hand safety controls combined with AC inverter agitator speed control and fast stop-action from a dynamic brake resistor. During the manual discharge sequence, the mixer is designed to agitate only when both of the operator’s hands are on pushbuttons — and away from rotating machinery.


A single programming platform, Connected Components Workbench™ software (www.rockwellautomation.com/go/ccws), helped configure all control products within the application, simplifying machine development.

“From a safety design standpoint, using the Guardmaster relay in combination with the PowerFlex drives was a game changer,” Lemieux says. “Instead of applying multiple, hardwired safety relays, we could achieve the function-

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With this free iPhone app, you have a convenient way to access product information, videos, websites, feature articles, Rockwell Automation event information and other resources.
More Torque! AMCI Partners with WITTENSTEIN

AMCI, manufacturer of SMD Series integrated motors, and WITTENSTEIN, producer of high quality gearheads, have partnered to sell their products together. WITTENSTEIN CP and NP series planetary gearboxes are now 100% compatible with AMCI’s integrated SMD Series stepper + motor + drive. The aluminum gearhead provides high power density, absolute reliability and optimal availability. When the gearheads are used with SMD integrated motors, the combination expands speed and torque performance over a wider variety of motion control applications, and offers an IP64 ingress protection rating. www.rockwellautomation.com/go/p-amci

ADVANCED MICRO CONTROLS INC.

WITTENSTEIN alpha V-Drive Basic Worm Gear

The V-Drive Basic worm gear is designed for price sensitive applications with no high-end requirements for maximum torsional backlash. Available with hollow or solid shaft, and a total of five different reduction ratios. At just 7.4 kg and 12 kg respectively, the lightweight V-Drive helps save energy when the gearhead is used in moving machine axes. www.wittenstein-us.com

WITTENSTEIN, INC.

New TILTIX Inclinometers

POSITAL FRABA has introduced new versions of its TILTIX inclinometers that provide reliable tilt measurement under dynamic loading conditions. These new devices feature advanced signal processing software that receives signals from arrays of accelerometers and gyroscopes and combines these to provide compensation for inertial effects. As a result, these instruments provide clean tilt measurements under shock, vibration or strong acceleration loadings. Dynamic TILTIX inclinometers are ideal for control and safety-assurance systems on mobile machinery, robots or other fast-moving equipment. www.posital.com

POSITAL FRABA INC.

Remote Equipment Monitoring

RACO offers three field-proven remote monitoring products that fully integrate with your existing Allen-Bradley® controllers. Both Verbatim Gateway and Catalyst allow for easy, cost-effective integration with PCs using Allen-Bradley EtherNet/IP™ and other protocols. Plus, AlarmAgent.com allows for low-cost, wireless, web-based alarm detection and notification that easily integrates into your SCADA/HMI system via OPC. All three provide the peace of mind that comes with knowing your systems are secure. For more information, call (800) 722-6999 or visit www.racoman.com/allen-bradley

RACO MANUFACTURING & ENGINEERING CO.

System Integration Just Got a Whole Lot Easier

HMS provides a family of network connectivity products based on the Anybus technology, which offers full integration into Rockwell Automation ControlLogix® and CompactLogix™ PLC controllers on EtherNet/IP to seamlessly communicate with Modbus, PROFIBUS, DF1 and serial devices. www.encompass.hms-networks.com/home

HMS INDUSTRIAL NETWORKS

InteGREAT

Itoh Denki expands its selection of 24VDC conveyor modules with the new F-RAT-U225 (Flat right angle transfer). It uses no pneumatics and comes in a low-profile design. It incorporates Run-On-Demand technology, increasing energy savings over traditional transfers. Quiet and capable of moving product in four different directions, the F-RAT-U225 is available in 10 sizes and can transfer products up to 110 lbs. Operated by two of our IB-E03 series of EtherNet/IP™ control cards, it can fit directly into existing MDR conveyor frames, simplifying integration. www.rockwellautomation.com/go/p-itohdenci

ITOH DENKI USA, INC.
Excel Reports and Forms for Industry

Finally, a reporting solution that gives the information you need, in the form you want, with absolutely no programming. With XLReprinter, you use Excel as your “design studio,” complete with our easy-to-follow FastStart wizard. Your reports are ready within minutes in Excel, Web, PDF and email. The product is compatible with RSLogix®®, RSView®, FactoryTalk® View, PanelView™ Plus, OPC, OPC-HDA, databases and much more. For more information, contact us at (508) 520-9957 or sales@SyTech.com. Download your free evaluation copy from www.SyTech.com.

SYTECH INC.

EtherNet/IP Process Video Recorder

IMPERX’s EtherNet/IPTM Process Video Recorder (EIPVR) is an event-recording system that captures high-speed video when you need it. This product is EtherNet/IP-conformance tested, compatible with IEEE 1588 and uses Power-over-Ethernet cabling for a simple installation. EIPVR records up to 60 seconds of video at 250 fps, automatically saves video to a server and plays video for quick feedback. EIPVR is triggered via EtherNet/IP, is ODVA tested and approved, and is compatible with EtherNet/IP devices. http://imperx.com/rockwell-encompass-partner-program

IMPERX, INC

Process Diagnostic & Optimization Technology

Is your goal to optimize production? PlantESP actively monitors control loop performance on a plantwide basis. It utilizes existing process data to uncover mechanical issues, PID tuning opportunities and more. PlantESP identifies issues, isolates root causes and recommends corrective actions. PlantESP’s powerful diagnostics and intuitive design make it easy to improve production throughput and efficiency. Customizable reports and alerts keep you informed of all performance changes. Contact us at (860) 872-2920 ext. 1602 or visit www.controlstation.com/plantesp.

CONTROL STATION, INC.

Dynamic Checkweigher Family

Hardy Dynamic Checkweighers deliver the benefits of open source (programmable with Studio 5000™), off-the-shelf (made with AB components) and seamless integration (FactoryTalk® data management). We listened to the needs of manufacturers and leveraged the Rockwell Automation Premier Integration model. This novel approach seamlessly integrates equipment data, control and analytics into plant-level and enterprise networks. www.hardysolutions.com

HARDY PROCESS SOLUTIONS

Molex CompactLogix Modules Are Now cULus Listed

Selecting a communication module for any application that connects a CompactLogix™ to either a Modbus or PROFINET networks is now easier. These Molex modules are not only comprised of leading technology and innovative software, but now are also cULus listed, offering the most functional and economical solution on the market today for your CompactLogix system. https://goo.gl/R1ulk2F

MOLEX

**ENCOMPASS SHOWCASE**

**Excel Reports and Forms for Industry**

Finally, a reporting solution that gives the information you need, in the form you want, with absolutely no programming. With XLReprinter, you use Excel as your “design studio,” complete with our easy-to-follow FastStart wizard. Your reports are ready within minutes in Excel, Web, PDF and email. The product is compatible with RSLogix®, RSView®, FactoryTalk® View, PanelView™ Plus, OPC, OPC-HDA, databases and much more. For more information, contact us at (508) 520-9957 or sales@SyTech.com. Download your free evaluation copy from www.SyTech.com.

SYTECH INC.

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MOLEX
Remote Operator for MCC Maintenance

Encompass™ Product Partner CBS ArcSafe introduces the SecureConnect remote operator system for Allen-Bradley® CENTERLINE® 2100 motor control centers (MCCs). The safety system allows technicians to remotely disconnect an individual plug-in unit or motor control bucket from the CENTERLINE vertical power bus while the enclosure door is closed and while standing up to 300 ft away.

A multipoint validation system confirms for operators when the unit or motor bucket power has been withdrawn from the vertical bus and can be manually withdrawn from the MCC. By isolating an individual MCC unit from the power source, the remaining MCC unit can continue to operate without disruption, thereby reducing the need to completely shut down the equipment and impact other processes.

A pair of limit switches inside the plug-in unit separately measure the position of the motor control contactors and the shutters on the MCC unit. Safe conditions are shown by a green LED light, while a red LED indicates that the unit is still connected to an energized bus or that arc-flash danger is still present.

Installation and operation of the system is quick, simple, and does not require any modifications to the existing electrical equipment.

Hardy Process Solutions
www.rockwellautomation.com/go/p-hardy

Weight Processing Module

Encompass™ Product Partner Hardy Process Solutions offers the Hardy HI 1734-WS POINT I/O™ Series weight processing module, a new plug-in module for the Rockwell Automation POINT I/O chassis. The true weight processing module is designed for POINT I/O systems, as opposed to passing raw A/D counts through the PLC for interpretation.

This module is easy to mount, set up, calibrate and maintain. It can be quickly installed and commissioned by snapping modules into terminal blocks onto a POINT I/O network adaptor. It is configured using a Rockwell Automation Add-On-Profile (AOP) in RSLogix® or Studio 5000® with no programming required.

Designed to replace analog transmitters, the module provides noise filtering and improved scale settling times. It is ultracompact, reducing machine cost and control cabinet footprint. The module also includes C2 weightless calibration, Integrated Technician system diagnostics, and WaverSaver immunity from mechanical vibration. Rockwell Automation adaptor products allow connectivity to EtherNet/IP™, DeviceNet, and ControlNet in linear, star and ring topologies.

EPLAN Software & Service
www.rockwellautomation.com/go/p-eplan

PRODUCT SPOTLIGHT

Schematics Generation Software

Encompass™ Product Partner EPLAN introduces the EPLAN Cogineer, a software package that generates schematics automatically, helping save time and avoid errors. EPLAN Cogineer is suitable for projects of any size, but can save large amounts of engineering time in large or complex projects with many schematics.

With one click, the software can generate complete electro-technical documentation. This provides error-free implementation of all defined rules and structures for accurate documentation and potentially shortens the entire order fulfillment timeline.

The software is integrated into the EPLAN Platform shared by EPLAN Electric P8 and other EPLAN software products. This allows users to create project data in EPLAN Electric P8, and then generate schematics using that data in EPLAN Cogineer without any duplication of effort.

The software has an intuitive user interface to help designers generate their first project within a short period of time. A mechatronic rulebook and configuration interfaces can be put together without knowledge of any high-level programming languages.
Direct Replacement for 1746-HSTP1

Encompass™ Product Partner Advanced Micro Controls Inc. (AMCI), offers their 3501-HSTP1 single axis stepper motor controller for the Allen-Bradley® SLC™ 500 system. The module is a direct replacement for the Allen-Bradley 1746-HSTP1 motion module for SLC 500, which has been discontinued.

The controller is designed to control the position and velocity of a stepper motor, and features discrete inputs for functions such as homing and emergency stop. The module also can control a servo system that has been configured to use step and direction inputs.

The drop-in replacement behaves like its predecessor, sharing identical features and programming software, with no additional changes needed. Sample programs are available on AMCI’s website and can be incorporated into new or existing ladder logic programs, making adding the module a quick and efficient process. The 3501-HSTP1 sample programs are written in RSLogix 500®.

AMCI
www.rockwellautomation.com/go/p-amci

Voltage Transducer

VTD-BD Series voltage transducers from Encompass™ Product Partner NK Technologies are high-performance transducers for sensing voltage in DC powered installations. Applicable for use on circuits to 600 VDC, the transducers provide a fully isolated ±5 VDC or ±10 VDC output signal in response to DC voltages that change polarity.

Housed in an easy-to-install DIN rail or panel mount case, the transducers come in a variety of ranges to suit many primary voltages. It includes industry standard outputs for use with existing controllers, data loggers and SCADA equipment. Its I/O circuitry is electrically isolated for improved safety.

The transducer is designed to detect below normal or “brown out” voltage conditions and conditions that may cause stress in or damage to soft starter components; identify conductor loss conditions by detecting voltage reduction in one motor lead; and monitor over voltage conditions associated with regenerative voltage.

NK Technologies
www.rockwellautomation.com/global/go/nktechnologies

PRODUCT SPOTLIGHT

Alarm Notification Software

Encompass™ Product Partner WIN-911 offers three new editions: WIN-911 Standard, Interactive and Advanced. They provide reliable alarm notification that can be configured from a basic call-out list to sophisticated workflows and dynamic alarm routing for highly complex environments.

The software can model complex escalation workflows, taking actual condition reports into consideration. Using a drag-and-drop interface, integrators can design multiple workflows, routing notifications by severity, type, role and based on dynamic conditions. Highly configurable policies govern notification, providing dynamic response as events unfold. These help deliver messages to the right personnel at the right time, for improved time-to-resolution and efficient staff management.

All editions allow complex scheduling including shared schedules, holiday schedules and 24-hour roll-over. Roles can be assigned to make sure alarms are sent to the correct people. When someone leaves or joins the organization, no alterations to the system are required. In addition, roles allow stepped call-outs. If one person in the role is unavailable, the system notifies the next person or all contacts in a role.

Editions run on the latest 64-bit operating systems and are engineered as “runtime all the time” to reduce downtime during configuration. WIN-911 connects directly with the latest versions of SCADA, HMI and OPC systems, and a modular architecture improves security. Easy, browser-based configurations are now stored in an SQL database for increased scalability. The software now supports VoIP and SMS messaging via Ethernet modem in addition to previously supported email, voice calls via analog lines, and smartphone/tablet apps.

WIN-911
www.rockwellautomation.com/go/win-911
Solid-State Cable-Pull Switch
The Allen-Bradley® Guardmaster® Lifeline 5 cable-pull switch from Rockwell Automation is a solid-state, cable-pull E-stop with microprocessor-based technology. The solid-state operation of the cable-pull switch offers an electronic, rope-monitoring system to compensate for thermal expansion and cable sag.

The switch provides constant access to the E-stop function, stopping a machine hazard with a simple pull of the attached cable. The microprocessor-based solution simplifies setup and allows for more efficient maintenance and troubleshooting. The easy-to-see LED indicators assist in cable tensioning for quick, precise setup while providing switch status and diagnostics during operation.

Available in die-cast aluminum or rugged, stainless-steel housings with IP66 and IP67 environmental ratings, respectively, the switch helps optimize productivity by combining maximum reliability with diagnostics that can help prevent unplanned downtime.

Platform Control Module
The OCP CompactLogix™ system from Encompass™ Product Partner Phoenix Digital includes military grade security, eliminates the need for IP addressing, requires no software configuration and has a MTTR of less than 30 seconds. It offers simplified industrial networking designed to improve Ethernet-based communications and system security without the complexity of traditional IT-based solutions.

The OCP system incorporates Gigabit communication speeds, enhanced diagnostics, and expanded Logix5000™ integration. The OCP also provides network RSS (return signal strength) for fiber optic troubleshooting and integrity testing, and supports both redundant fiber optic and redundant copper-based ring communication media.

The OCP makes installation as simple as plugging in any standard I/O module. This makes it easier to expand networking capabilities and results in simpler system architectures fully maintainable by maintenance staff.

PRODUCT SPOTLIGHT
Enhanced HMI FactoryTalk View Software

The latest version of FactoryTalk® View software from Rockwell Automation improves the operator’s experience with valuable, data-driven information while also delivering enhanced design-time productivity via tighter integration with the control system.

FactoryTalk View v9.0 includes the TrendPro trending tool that helps operators access real-time data with built-in analysis tools. The tool showcases contextualized production data by pulling from a variety of sources that were once difficult to access: FactoryTalk View SE data logs, FactoryTalk Live Data and FactoryTalk Historian data. The latest release provides operators easy, ad hoc, drag-and-drop capabilities that bring trends front and center.

The software uses the Integrated Architecture portfolio to directly connect with Allen-Bradley® ControlLogix® tags. New tag-extended properties remove the need for redundant engineering work, giving developers direct access to tag descriptions, engineering units and min/max settings. This leaves less room for duplication errors and streamlines the design process.

Tag-extended properties also allow simplified language switching. Instead of requiring a developer to program language strings within the HMI, translated content now can be directly accessed from the controller, further saving design time.

RecipePro+, the software’s new recipe manager, allows download and upload of multiple machine parameters at once. A user-friendly interface helps create, edit, import and export recipe files.

FactoryTalk ViewPoint mobile HMI software also improves productivity in version 9.0. Operators are now able to acknowledge or shelve an alarm notification directly from a mobile device.
**Servo Motor**
The Allen-Bradley® Kinetix® VPC servo motors from Rockwell Automation allow manufacturers to run machines at higher speeds and higher torque for improved machine throughput. A cooling fan and cooling fins on the motor provide increased torque and power output. Encoder options with improved resolution and accuracy provide more precise and responsive control.

The servo motor also helps reduce machine downtime. It uses larger bearings to improve L10 bearing life by up to 60%. An optional single cable for power and feedback helps reduce installation, setup and maintenance time compared to dual-cable motors. The field-replaceable, quick-change fan helps maintain maximum machine uptime.

The motors meet or exceed IE4 efficiency ratings, which can save energy costs compared to using an IE3 or lower-rated motor. When used with the Kinetix 5700 servo drive, the motor can also help manufacturers use less current than larger, more energy-intensive motor and drive solutions.

As part of the Rockwell Automation Integrated Architecture platform, the motor and drive are programmed using the Rockwell Software Studio 5000® design environment. This integrated design approach can help speed up machine deployments and reduce the likelihood of manual errors.

Allen-Bradley Kinetix VPC Servo Motor
www.rockwellautomation.com/global/kinetixvpc

**Level Transmitters with Advanced Diagnostics**
Rockwell Automation Strategic Alliance Partner Endress+Hauser adds Heartbeat Technology to its Micropilot FMR5X free-space radar and FMPSX Levelflex guided radar level transmitters.

Heartbeat Technology is an onboard diagnostics and instrument verification system that continuously monitors the status of mechanical, electromechanical and electronic components in the sensor, and sends alerts when it detects a problem. Alerts are sent in accordance with NAMUR recommendation NE 107 and displayed at the device. The built-in diagnostics can detect process problems, such as build-up or foam, before failure occurs.

Heartbeat Technology also performs device verification in accordance with industry requirements that call for level instruments to be removed and calibrated unless in-situ verification proves the device is operating properly.

The Micropilot FMR5X series of free-space radar level transmitters provide accuracy up to ±2mm for level measurement of liquids and ±4mm for bulk solids products. Multiple transmitters can be installed in the same tank without interference among them because the transmitter pulses are statistically coded.

Levelflex guided radar level transmitters are used for continuous level measurement of liquids, pastes and slurries but also for interface measurement. The measurement is not affected by changing media, temperature changes, gas blankets or vapors.

Endress+Hauser
www.rockwellautomation.com/go/p-eh

**Wireless Environmental Monitoring System**
Rockwell Automation Strategic Alliance Partner Panduit Corp. introduces its SynapSense wireless environmental monitoring system. The easy-to-deploy solution gathers, communicates and visualizes environmental data within the facility for improved reliability, product quality and energy optimization.

Robust wireless mesh sensing technology delivers granular temperature, humidity and differential air pressure data to the IIoT application at a fraction of the time and cost of wired solutions. The software package includes tools to visualize, analyze and alarm from multiple devices, easing deployment and allowing immediate use of collected data. Complete kits with detailed instructions are available to further speed learning and deployment.

Panduit
www.rockwellautomation.com/go/p-panduit
**MagneMotion LITE Independent Cart Technology**

MagneMotion, a Rockwell Automation company, offers the MagneMover LITE independent cart system to help improve productivity in manufacturing operations. Independent cart systems replace hardware with simple software profiles, so changeovers can occur at the press of a button.

The system is designed to quickly and efficiently move light loads in in-machine and between-machine applications. The programmable independent carts on a straight or curved track can boost speeds by up to 30% over mechanical systems.

The independent cart system can be used in assembly, process, test and manufacturing applications in the medical device, assembly, automotive, pharmaceutical, packaging and optical industries. The system also can help end users reduce their energy usage and machine footprint size.

MagneMotion
www.magnemotion.com/magnemover-lite/

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**PRODUCT SPOTLIGHT**

**Food-grade Servo Actuator**

The IMA electric linear actuator from Encompass™ Product Partner Tolomatic, is now available with a food-grade white epoxy coating and stainless steel components for washdown applications in the food and beverage industry. The compact IMA actuator series integrates a servomotor and a ball or roller screw designed to extend service life.

The integrated motor design is suited for applications such as slicing control, pressing, valve control and volumetric filling. Available in four sizes, the actuators feature stroke lengths from 3 to 18 in. (76.2 to 457.2 mm) and peak thrusts from 200 to 6,875 pounds force (890 to 30,594 N) at speeds up to 24 in./sec (610 mm/sec).

With its integrated servomotor, the IMA actuator is shorter for a given stroke length than other types of electric rod actuators. Its design allows for easy re-lubrication of the screw without disassembly, increasing service life. It integrates seamlessly with the Rockwell Automation Kinetix® platform with approved custom motor files (CMF/BLB) for the PIC and integrated motor actuator.

A hollow-core rotor design allows the nut of the screw to pass inside the rotor, creating a compact package. This decreases overall actuator length compared to standard actuators due to the elimination of a separate motor, motor mount and gearbox. Skewed stator windings minimize cogging of the motor and provide more efficient motion with improved force repeatability.

Tolomatic
www.rockwellautomation.com/go/tolomatic

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**Arc-Flash Relay**

Encompass™ Product Partner Littelfuse, Inc. introduces the AF0100, a compact, cost-effective arc-flash protection relay sized to fit tight footprints and budgets.

Measuring 3.5 in. high x 5 in. wide x 2.4 in. deep, the relay is 30% smaller than previous models. Both DIN-rail and surface-mountable, the AF0100 can be retrofitted easily into existing switchgear or pre-installed in new equipment with little or no configuration.

The relay detects light from an impending arc-flash and rapidly trips to reduce potential damage. Its two light sensor inputs accept point sensors and fiber optic sensors in any combination for installation flexibility. The energy-reducing arc-flash mitigation system helps comply with the latest National Electrical Code (NEC) requirements.

The design includes two internal trip paths for greater reliability. If the first trip path fails, the backup trip path seamlessly takes over and sends an alarm notifying the operator. The backup trip path also initializes quickly upon power up to provide protection while the system is energizing and when arc-flash risks are higher. Sensor health is continuously monitored for fail-safe operation.

Littelfuse Inc.
www.rockwellautomation.com/go/p-littlefuse
Networked Safe Torque Off Option Module

Rockwell Automation has introduced a networked safe torque off option module, allowing safety and nonsafety functions to share the same EtherNet/IP™ network. Designed for the Allen-Bradley® PowerFlex® 755 and PowerFlex 755T AC drives, this safety option helps protect personnel and equipment by removing rotational power from the motor without removing power from the drive. This functionality allows a quick restart after a demand on the safety system.

Compatible with both Allen-Bradley GuardLogix® and Compact GuardLogix controllers, the option module allows users to have one IP address for both the safety and control functions, reducing the number of ports required. The networked safe torque off option module is compliant with global industry standards, providing a SIL 3/PLe Safety Integrity Level rating, and can be used for hardwired and networked safe torque off applications.

With the safety functions integrated over EtherNet/IP, users experience reduced hardware and installation costs, improved productivity and a reduced panel footprint. The networked safe torque off option module has the flexibility to be field-installed when the functionality is required.

Simulation Software Update

Encompass™ Product Partner MYNAH Technologies announces the latest release of Mimic simulation software, v3.7.0. Mimic is a software platform for the process industries that provides fast, easy, flexible, dynamic simulation for plant operations life cycle results.

The latest version contains the new Mimic Advanced Thermo Package. This is a complete set of advanced thermodynamic methods and data designed to help users develop an accurate dynamic simulation of their plant. The package is built for easy user configuration, and real-time model performance.

The package also is designed to reduce the time and effort required to build and maintain high fidelity simulators with an intuitive, easy-to-use approach. Thermo methods and data are set per Mimic Component Set, providing an intuitive, fast, open, and flexible approach to using advanced features. A wizard guides users through setup and tuning of component sets. Users also can change or copy component sets to try different thermo methods quickly and easily.

EtherNet/IP to PROFIBUS DP Linking Device

Encompass™ Product Partner HMS Industrial Networks has released the third product in their EtherNet/IP™ Linking Devices family. The new EtherNet/IP to PROFIBUS DP Linking Device allows users to connect devices on PROFIBUS to a Rockwell Automation ControlLogix® or CompactLogix® PLC.

The device makes it possible to introduce any automation device with PROFIBUS DP communication into an EtherNet/IP-based network architecture. It is designed to be a cost-effective alternative to in-chassis communication modules.

Mounting the unit close to the connected devices instead of the PLC allows connection via a single Ethernet cable instead of multiple network specific cables. The linking devices support ODVA’s Device Level Ring (DLR) for ring topology.

Users access their PROFIBUS DP network and device configuration through their existing Studio 5000 Logix Designer™ software from Rockwell Automation. Studio 5000 supports process variable data tags, and manual and automatic generation of named and structured Studio 5000 Controller Tags without any required user logic.

The device supports up to 7,000 bytes of I/O data, 3,500 in each direction. Because the device operates stand-alone (distributed), it doesn’t affect PLC backplane performance, even when large amounts of data are transferred. The PLC simply scans the linking device as if it were any other I/O device on the network.

HMS Industrial Networks

www.rockwellautomation.com/go/p-hms
Voltage Indicator

Encompass™ Product Partner Grace Engineered Products offers the SafeSide Flex-Mount voltage indicator (R-3D2), a permanent electrical safety device (PESD) that mounts onto any electrical equipment. In addition to the four-wire option, the Flex-Mount has an optional five-wire configuration for use in wye connected systems.

Engineered with redundant LED circuitry, the voltage indicator is powered by the same voltage it indicates. The indicator is externally mounted to one of four sides of a power disconnect or motor combination starter.

The device comes fully potted with CAT III and CAT IV ratings that can be hardwired directly to the voltage source and designed for use in both AC and DC applications. Once incorporated into a facility’s electrical safety procedure, qualified personnel can safely and productively validate zero electrical energy without being exposed to voltage.

The voltage indicator is CE and cUL Listed and can be installed on any equipment with an M20 or ¾-in. conduit knockout.

Grace Engineered Products, Inc.
www.rockwellautomation.com/go/p-grace
Inclusion Fuels Innovation

We create an environment where our almost 22,000 people can bring their best work, be heard, and work together as partners. It’s about all of us bringing our best to transform our company. Our Culture of Inclusion fuels innovation for everyone.

We are honored and humbled to win the 2017 Catalyst Award, which recognizes innovative organizational approaches with proven, measurable results that address the recruitment, development, and advancement of women. Our work continues — we’re not done yet.
Innovation That Delivers Complete Connectivity

Simply Solved

Molex is a Rockwell Automation Encompass Product Partner, with over 20 years of seamless innovation at every step of the process. From proof of concept and design through engineering and manufacturing, we continually develop cutting-edge technologies that are based on customers’ needs. With proven expertise, our in-house engineers develop solutions utilizing Molex hardware, software and firmware to solve our customers’ network communication requirements.

See how Molex innovation can answer your industrial automation challenge by visiting www.molex.com/a/encompasspartner