

THE JOURNAL

From Rockwell Automation and Our PartnerNetwork™

HAND OVER CONTROL

Smart drives with built-in predictive-maintenance functions do a lot of the hard work for you, making maintenance strategy easier to implement.

3 KEYS TO
FUTURE-PROOFING
AUTOMOTIVE PRODUCTION

WHICH ELECTRIC
LINEAR ACTUATOR
SHOULD YOU USE?

2020 AUTOMATION FAIR
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HAND OVER CONTROL 16

Smart drives with built-in predictive-maintenance functions do a lot of the hard work for you, making maintenance strategy easier to implement.

FEATURES

Ribbon Maker Cuts Manual Machine Monitoring by 30%

Automating part of its process helped this family business boost efficiency and begin producing types of ribbon that were previously not possible.

How a Toyota Engine Plant Slashed Energy Costs

New air compressor controls are saving 1 million KWh annually and support Toyota's zero-emissions goals.

3 Keys to Future-Proofing Automotive Production

Connected, flexible and scalable powertrain or drivetrain operations can help you keep up with demand and adapt to inevitable technology changes.

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Learn what to look for designing an electro-mechanical system to optimize food and beverage processes, including the basics of key hygienic requirements.

26 What is an IP67-Rated Machine Vision Camera? 35

Here's what IP67 means, and how the IP67 rating protects a camera from dust and water ingress, temperature extremes or high shock or vibration.

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THE JOURNAL

From Rockwell Automation and Our PartnerNetwork™

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ADDITIONAL RESOURCES

The "Automation Chat" podcast features fun and educational discussions providing keen insights about the technologies and trends affecting today's rapidly changing manufacturing environment.

Hosted by Theresa Houck, executive editor of *The Journal From Rockwell Automation and Our PartnerNetwork™* magazine, the podcast is available on the iPhone Podcasts app, Google Play or Spotify. Or listen at <https://rokthejournal.podbean.com>.

Here are some recent episodes:

All About Digital Twins and Virtual Commissioning

Chris Harduwar, VP of Automation at Encompass™ Product Partner Maplesoft, talks about how to use virtual commissioning and digital twins to improve machine development; how digital twins work; how companies would evaluate if virtual commissioning would be a useful tool for them; examples of applications; the difference between MapleSim and the Rockwell Automation Emulate3D solution; and more.

Misconceptions About Shock Safety

Did you know that in the United States, shock is associated with all electrical-related fatalities? In this powerful episode, Mark Pollock, global product manager with Encompass™ Product Partner Littelfuse Inc., and Terry Becker, an electrical safety specialist and management consultant, discuss what contributes to severity of a shock; how NFPA 70E and CSA Z462 updates have affected trends in safety incidents; how industrial GFCLs work; the importance of risk assessments and how to conduct them; and more.

26



35



PLC NETWORK PRODUCTS



Featured Product SV160E2 Integrated Servo

SV160E2 Integrated Servo

AMCI's new SV160E2 integrated servo motor eliminates the need for a separate servo drive, controller, motor, and cabling. No software needed. All programming is done using Studio5000®



THE JOURNAL

From Rockwell Automation and Our PartnerNetwork™

AUGUST 2020, VOLUME 27, NO. 4

In Memory of Julie Cappelletti-Lange
Vice President 1984-2012

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VIRTUALLY EVERYTHING IS GOING... VIRTUAL



Meetings, client calls, videos, screen sharing — most daily business activities are “virtual” now because of COVID-19. While virtual events such as webinars and small-scale meetings have been around for years, 2020 is the year when everything went into hyper drive to transition content intended for live audiences to the online world.

A great example is ROKLive in June 2020 (formerly Rockwell Automation TechEd), the Rockwell Automation industrial digital transformation virtual event and education experience. It drew record attendance! And the content is available online until November, including training sessions, labs and presentations from industry experts showcasing opportunities and advancements in digital transformation.

This year's Automation Fair® event also is going online. Automation Fair At Home is Nov. 16-20. Location: Your home. Dress code: Your choice. Airfare: \$0. No masks, no walking the exhibit floor for miles. As you'll learn in our preview starting on page 30, Automation Fair At Home will be a dynamic virtual experience that will include technical training, product and technology showcases, customized demos for customers, industry forums, and trade show experiences.

Also, in this issue of *The Journal*, you'll learn about motor and power technology advancements, including self-aware variable-frequency drives (VFDs) that contain analytics technology within their firmware to implement predictive maintenance (see p. 16). Get that? Built-in predictive-maintenance. I love technology.

In this “new normal” phase — which, let's face it, is just plain normal at this point — we're all adjusting to make changes needed to stay competitive. The Automation Fair At Home event is designed to provide you with information to help you do that. Until next time...



Theresa Houck, Executive Editor



ROCKWELL AUTOMATION ANNOUNCES PERSONNEL CHANGES

Patricia Contreras and Rob Ninker step into new roles after Bruce Quinn and Steve DuBois retire.

➤➤ Rockwell Automation, Inc. has announced several changes to its North American leadership. Patricia Contreras has been named vice president of Global Public Affairs, effective July 1, and Rob Ninker is regional vice president, North America Channels, effective August 1. Ninker replaces Steve DuBois, who will retire at the end of 2020 after 18 years with the company.

Contreras replaces Bruce Quinn, who retired in June. In her new role, Contreras will oversee the company's federal and state government affairs activities, external communications, media relations, corporate responsibility and environmental, social and governance (ESG) reporting functions as well as the community relations and contributions group. Most recently, Contreras served as director of Global Community Relations and Contributions. She is the first Latina to lead the company's global public affairs function.

A 10-year veteran of the company, Contreras joined the charitable contributions team at Rockwell Automation in 2008.

Ninker joined Rockwell Automation in 1987 as a Sales & Channels engineer. During his more than 30-



Patricia Contreras has been promoted to vice president of Global Public Affairs at Rockwell Automation.

year career with Rockwell Automation, he has held a variety of global roles in engineering, sales, marketing and channels management across Asia Pacific, Latin America and North America. Prior to this new role, Ninker was business director, Customer Support & Maintenance, North America.

Ninker will transition into his position with guidance from DuBois, who was instrumental in creating a strong foundation for distributor partners and system integrators and increasing partner collaboration.

ROCKWELL AUTOMATION TO LAUNCH NEW OPERATING SEGMENTS

Beginning in fiscal year 2021, Rockwell Automation will report revenue and operating earnings based on three operating segments: Intelligent Devices, Software & Control, and Lifecycle Services. The change is designed to simplify the structure around essential offerings, leverage the company's sharpened industry focus, and recognize the growing importance of software in delivering value to customers.

The Intelligent Devices segment will be led by Fran Włodarczyk, currently the senior vice president of the Architecture & Software segment, and will include drives, motion, safety, sensing, industrial components, and configured-to-order products.

The Software & Control segment will be led on an interim basis by Chris Nardecchia, currently senior vice president of Information Technology and Chief Information Officer, while an external search is

conducted for a new senior vice president for this segment. This segment will include control and visualization software and hardware, information software, and network and security infrastructure.

The Lifecycle Services segment will be led by Frank Kulaszewicz, currently senior vice president of the Control Products & Solutions segment, and will include consulting, professional services, connected services, and maintenance services, as well as the Sensia joint venture with Schlumberger.

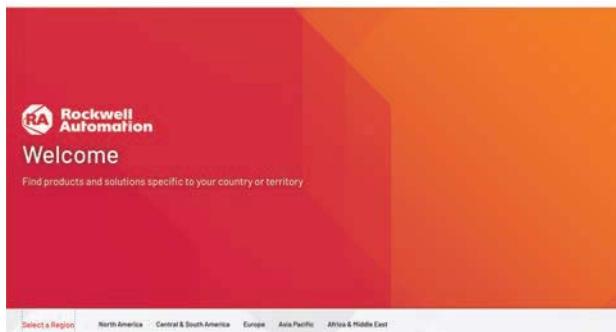
ROCKWELL AUTOMATION LAUNCHES NEW WEBSITE

In July, Rockwell Automation launched a new and improved website based on customer feedback. Key changes include a new tools launchpad, where site visitors can access the most commonly used tools from every page. This provides quicker access to popular resources, such as the Literature Library, downloads, Knowledgebase, service tickets and software subscriptions.

Another major enhancement is the merging of AB.com, the website dedicated to Allen-Bradley® brand products from Rockwell Automation, into RockwellAutomation.com. This eliminates the need to bounce between sites. All hardware and software information now is in one place under the Products tab.

In addition, under the new Support tab, visitors will find all the tools, downloads, documentation, training and services needed to design, maintain and migrate industrial applications.

The interactive website's fresh, modern look also includes easier-to-read URLs for enhanced search engine capabilities, and the homepage can be personalized to capture products and solutions specific to each visitor's country or territory.



>> PartnerNetwork Brief

Littelfuse Launches Arc-Flash Knowledge Center.

Encompass™ Product Partner Littelfuse, Inc., a global manufacturer of circuit protection, power control and sensing, introduces a new arc-flash knowledge center for engineers, electricians, maintenance workers and others creating a safer electrical environment. The resource provides arc-flash information on causes, mitigation and incident energy calculations and white papers, videos and case studies. Visit Littelfuse.com/arcflash.



ZEBRA TECHNOLOGIES NAMED A BEST PLACE TO WORK IN IT

Encompass™ Product Partner Zebra Technologies Corp., Lincolnshire, Illinois, has been selected as one of *Insider Pro* and *ComputerWorld's* 2020 Best Places to Work in IT. The Best Places to Work in IT list is an annual ranking of the top 100 work environments for technology professionals. Zebra ranked third among the top 25 midsize employers nationwide.

The list is compiled based on a comprehensive questionnaire about company offerings in categories such as benefits, career development, training and retention. In addition, survey responses from IT workers factored heavily in determining the rankings.

Zebra's IT team has been recognized for its comprehensive talent management strategy focused on inclusion and diversity, performance leadership, individual development and rewards. This strategy includes a collaborative online learning platform called the Zebra Education Network powered by Degreed, individual development plans

(IDPs), high-potential development tracks and both pay-and points-based recognition programs.

“We are honored to receive this validation from the IT community and take pride in creating a culture of respect, collaboration, inclusion and innovation,” said Deepak Kaul, chief information officer, Zebra Technologies. “We will continue to drive an intellectually stimulating environment focused on growth and development to give both our employees and those we serve a competitive edge.”

The full list of 2020 Best Places to Work in IT will be available at www.IDGInsiderPro.com. *Insider Pro* and *ComputerWorld* are published by IDG Communications, Inc.

FDT GROUP AND ODVA ADD CIP SUPPORT

FDT Group, a global nonprofit association supporting the evolution of FDT technology, announced its continued partnership with ODVA, Inc. The partnership adds support for FDT’s latest 3.0 architecture solution, incorporating the new FDT IIoT Server (FITS), to the Common Industrial Protocol (CIP™). CIP-based networks such as EtherNet/IP™ lead network communications for both the process and factory automation sectors, who will directly benefit from the emerging communication annex supporting the FITS platform.

FDT and ODVA share a common core mission that includes advancing open, interoperable information and communication exchange for the industrial automation marketplace. The industry associations have cooperated

>> PartnerNetwork Brief

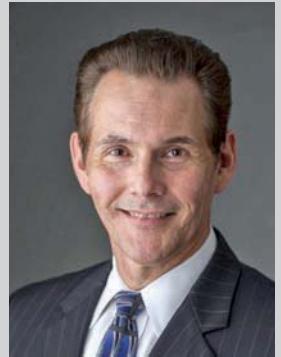
Tolomatic Names new President, CEO. Encompass™

Product Partner Tolomatic, Inc., named Paul Carlson president and chief executive officer. Carlson has more than 30 years of manufacturing experience serving a range of industrial, commercial, food and beverage markets globally. Most recently, Carlson served as vice president of the Commercial and Residential Solutions Division of Emerson Electric Co. He also served as president of Control Products, Inc., a manufacturer of custom electronic controls, sensors and electromechanical assemblies for OEM customers.



>> PartnerNetwork Brief

Realwear Announces CEO and Board Changes. Encompass™ Product Partner RealWear, Vancouver, has named Andrew Chrostowski as chairman and acting CEO. Chrostowski previously served as COO, and more recently as chairman of the RealWear Advisory Board. He is a National Association of Corporate Directors (NACD) Certified Director and Governance Fellow and the former president of Scott Safety, a business that was sold to 3M for \$2 billion in 2017. Also, co-founder and company president Sanjay Jhawar was appointed to the Board.



on the ability to integrate devices implementing ODVA technologies (EtherNet/IP, DeviceNet™, ControlNet™ and CompoNet™) and standards into the FDT ecosystem for more than 15 years.

Recent work resulted in a CIP annex supporting the FDT 2.0 desktop and client/server architecture, which enables seamless nesting through all the networks and in combination with any other network supported by the current version of the FDT standard. This effort allowed any CIP-based FDT Device Type Manager™ (FDT/DTM™) to integrate seamlessly with any FDT-based hosting environment in a plug-and-play manner.

The FDT 3.0 standard will soon be released and will execute FDT Group’s digital transformation pathway to connect and empower the intelligent enterprise supporting the new era of automation for IIoT and Industry 4.0 applications. Based on industry-driven feedback, the new FITS platform supports skid-to-cloud deployment, a robust security architecture, remote access and mobility, IT/OT integration and compatibility.

STRATUS TECHNOLOGIES EARNS ACCOLADES

Encompass™ Product Partner Stratus Technologies has been named a product award finalist by several publications for its ztC Edge computing platform.

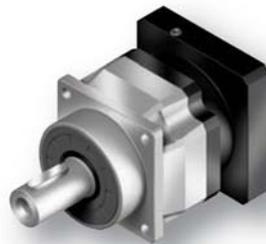
Oil & Gas Engineering named it a 2020 IIoT & Process Control award finalist. This annual award honors automation and information technology innovations

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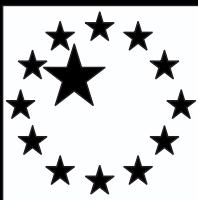


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for oil and gas processes and equipment, highlighting opportunities to advance companies' efforts to operate at peak performance.

Gold, silver, and bronze Product of the Year winners will be chosen by readers, who have until October 16, 2020 to vote. Readers include engineering, operations, and management professionals responsible for optimizing processes and ensuring reliability.

Hydrocarbon Processing (HP) also named the ztC Edge a finalist for its 2020 "Best Process – Plant Optimization" award. This honor emphasizes the ztC Edge's ability to provide advanced edge compute technology to increase efficiency and shorten the time to getting critical applications up and running.

The *HP Awards* celebrate innovative technologies that have been instrumental in improving facility operations. The program honors leading innovations in Energy as well as outstanding personal contributions to the industry.

Stratus also earned *Plant Engineering's* Product of the Year Silver award for the ztC Edge 110i. Readers voted on new and transformative products based on innovation and performance.

The ztC Edge is a secure, rugged, highly automated Edge Computing platform that helps organizations achieve peak performance through increased operational efficiency and zero downtime at the edge. Its built-in virtualization, automated protection, and industrial interoperability is designed to help users easily achieve high availability, simplified deployment and manageability, and reliable security and performance as more assets are connected to the enterprise or cloud and more applications are decentralized in the operation.

>> PartnerNetwork Brief

Owl Names New VP of Engineering. Encompass™ Product Partner Owl Cyber Defense Solutions, LLC, has named Sudhir Nelvagal vice president, Engineering. In this role, Nelvagal will focus on implementing long-term product development strategies and oversee the integration of Owl's engineering teams among its two offices in Danbury, Connecticut and Columbia, Maryland. Most recently, he served as Digital Mission Leader at GE Research in Schenectady, New York.



In this role, Nelvagal will focus on implementing long-term product development strategies and oversee the integration of Owl's engineering teams among its two offices in Danbury, Connecticut and Columbia, Maryland. Most recently, he served as Digital Mission Leader at GE Research in Schenectady, New York.

>> PartnerNetwork Brief

FRABA Celebrates 20 Years. Encompass™ Product Partner POSITAL-FRABA Inc.'s U.S. branch has been operating since 2000. Starting with just one home office, the company has expanded to numerous employees and a production facility. In its first year of business, the company generated less than \$100,000 in business; in 2020, revenue grew to more than \$7 million.

SOUTHWIRE EXPANDS MANUFACTURING CAPACITY

Encompass™ Product Partner Southwire, a manufacturer of wire and cable, and tools, components and assembled solutions, recently began construction of a 250,000-sq.-ft. addition to its manufacturing campus in Bremen, Indiana.

"With this expansion, we will now have more capacity in Bremen to support our OEM customer base, enhance our Southwire SPEED services and better serve the commercial, institutional, factory automation, electric vehicle and telecom markets," said David Skinner, vice president of manufacturing.

Southwire started operations in Bremen upon the company's acquisition of Coleman Cable in 2014. Since that time, the existing 476,000-sq.-ft. manufacturing campus has supported Southwire's OEM customers through a range of wire and cable products.

The company expects the expansion to create around 115 jobs over the next three years. The building expansion is projected to be completed by early 2021 with equipment installations to follow.



Southwire breaks ground on construction of a 250,000-square-foot addition to its manufacturing campus.



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LITTELFUSE NAMED BEST PLACE TO WORK

Chicago-based Littelfuse, Inc., a global manufacturer of circuit protection, power control and sensing technologies, and a Rockwell Automation Encompass™ Product Partner has been named as one of the 2020 “Best Places to Work in Illinois” in the large employer category. This is the ninth consecutive year the company has been recognized by this awards program.

Sponsored by The Daily Herald Business Ledger in partnership with the Illinois Chamber of Commerce, MRA-The Management Association, the Small Business Advocacy Council, and Best Companies Group, the statewide awards program recognizes the best places of employment in Illinois, benefiting the state’s economy, workforce and businesses.

>> PartnerNetwork Brief

Matrix Technologies Opens Georgia Office. Maumee, Ohio-based Matrix Technologies, Inc., a Rockwell Automation Solution Partner, has expanded into the Southeast region. The new office is located at 1280 Highway 74 South, Suite 110, Peachtree City, GA 30269. The location will provide multidiscipline engineering, automation, and information engineering services. The team will bring experience in a variety of engineering disciplines and industries.



ENJOY THE JOURNAL'S PODCAST, "AUTOMATION CHAT"

Join Theresa Houck, Executive Editor of *The Journal From Rockwell Automation and Our PartnerNetwork* magazine, for our “Automation Chat” podcast.

Enjoy short, informative and fun conversations with industrial automation pros about technology, digital transformation, industry trends, workforce challenges and more.

Available on your favorite podcast app, or listen here: <https://rokthejournal.podbean.com>.



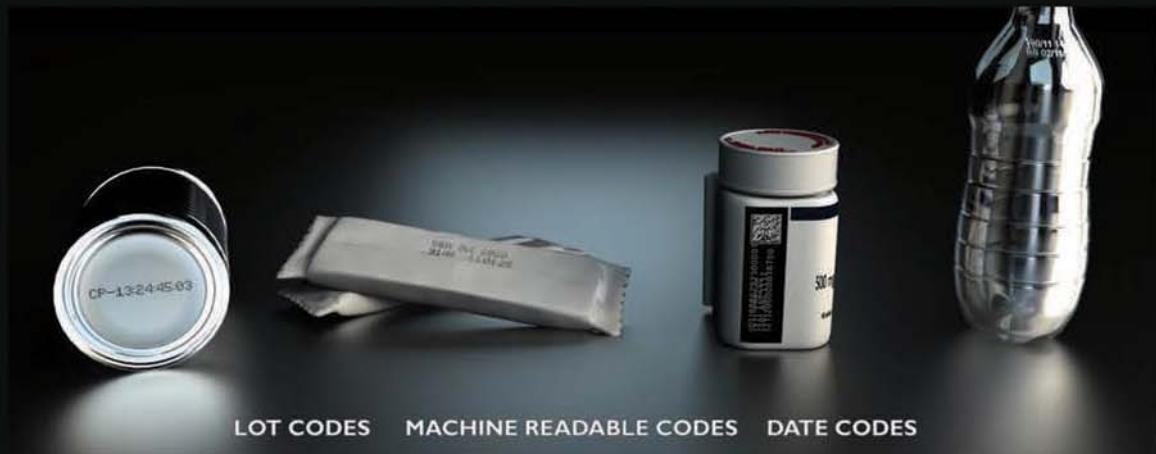
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A human hand in a grey suit sleeve holds a black car key fob. A white robotic hand reaches up from the bottom right towards the key fob. The background is a solid teal color.

HAND OVER CONTROL

*By Garron Morris, Sr.,
principal engineer,
Rockwell Automation*

Smart drives with built-in predictive-maintenance functions do a lot of the hard work for you, making maintenance strategy easier to implement.



>> Many industrial producers already use predictive maintenance to identify equipment problems early and get ahead of downtime events. And now, technology advances such as self-aware variable-frequency drives (VFDs) are making this smarter approach to maintenance easier to implement.

Self-aware drives contain within their firmware the analytics technology to implement predictive maintenance. They use advanced physics-of-failure models to convert stressors, such as speed, voltage and temperature, into component-life consumption. This allows them to calculate how many hours remain until the percentage of consumed life reaches its event level, which is the maximum life consumed before an alarm is generated.

When a component reaches a user-defined event level, the drive informs maintenance personnel that preventive maintenance is needed.

Predictive models are tailored to the drive components that they monitor, so users can feel more confident about the need to replace them. Power semiconductors, fans, DC bus capacitors, contacts and switches, and line capacitors are all examples of components that benefit from predictive models.

Power Semiconductors

The predictive models for drive-power semiconductors are known as insulated-gate bipolar transistors (IGBTs). They are based on a physics-of-failure model created from IGBT-manufacturer data and extensive testing. The models address two IGBT failure modes: short-term bond-wire fatigue and long-term solder fatigue.

Applications with high internal IGBT temperature cycles will consume life faster than applications with low temperature cycles. To calculate these temperature cycles, a combination of internal sensors, control parameters and advanced thermal models are used.

Because the predictive models rely on real drive operation, they consider the drive operation's dynamic nature to capture actual life consumption. Elapsed- and remaining-life calculations are updated

>> Rockwell Automation Encompass Partners Support Predictive Maintenance

Encompass™ Product Partner companies in the Rockwell Automation PartnerNetwork™ program provide capabilities that support asset management. Visit <http://bit.ly/ROKEncompass> to learn more about how they can help you.

Software – Asset Management

Eagle Technology, Inc.
Llumin, Inc.

every minute, and the remaining-life calculation is determined based on the user-defined event level.

Fans

Predictive models for each fan are based on physics-of-failure models for bearing life and any life-limiting

electronics that either have reliability data from the fan manufacturer or have undergone life testing.

Fan life is affected by local air temperature, fan speed and total rotation time. To track local air temperature, the predictive model uses either direct measurements or accurate estimations from one or more air-temperature sensors. For the rotational time, the drive tracks a fan's on/off state, and the actual fan speed is monitored.

When a fan is not rotating, life isn't being consumed. A fan-derating parameter also reduces the calculated remaining life. This parameter accounts for other stresses, such as environmental contamination, which reduce fan life.

DC Bus Capacitors

A DC bus capacitor's predictive model is based on a physics-of-failure model from the manufacturer. Two factors that affect capacitor life are internal temperature and applied voltage. To calculate the heat generated inside the capacitors, the predictive model uses several sensor and control values. The internal temperature is calculated from two temperature sensors and the heat-generation estimates using an empirical model derived from extensive thermal testing.

Contactors and Switches

The lifespan models for a drive's main circuit breaker, pre-charge contactor and molded case switch all are based on the number of no-load disconnect actions. Each action consumes life from the total available life of these components.

Line Capacitors

The line-capacitor life in a drive's LCL filter is most affected by



What to do when analog won't do?

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Download *The Journal* magazine's 2020 Motors & Electrical Systems eBook to learn how to improve drive performance and motor efficiency; how drive-based predictive analytics help extend machine life; how AC drives and shielded VFD cables help boost safety; how to use linear actuators in automated electromechanical systems; and more. Download the free eBook by visiting <https://bit.ly/20motoreleceb>.

capacitor temperature. The predictive model combines manufacturer data with a physics-of-failure model that uses temperature as an input. Capacitor temperature is calculated from a model that uses data from extensive thermal testing. The component's life is consumed faster as the ambient temperature increases, and elapsed and remaining life calculations are updated by the minute.

What Does This All Mean?

Predictive maintenance helps reduce unplanned downtime and boost overall productivity. Drives with built-in predictive-maintenance functions are designed to do a lot of the hard work for you. They already have life models that learn and adapt to changes in the application and environment, so all that remains is to develop a maintenance plan for using the insights the drives give via life consumed and predicted remaining lifetime. □

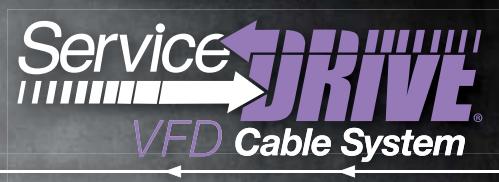
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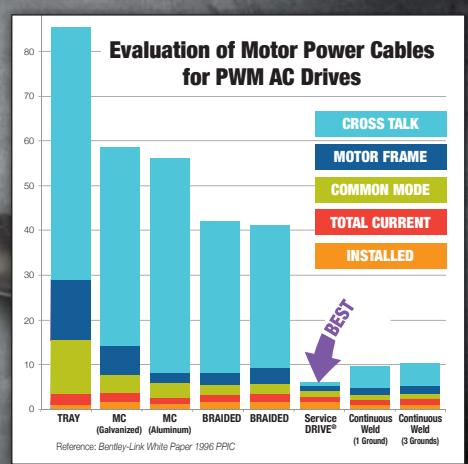
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MC (Aluminum)	~40	~10	~5	~55	~60
BRAIDED	~35	~10	~5	~50	~55
Service Drive	~5	~5	~5	~15	~20
Continuous Weld (1 Ground)	~5	~5	~5	~15	~20
Continuous Weld (3 Grounds)	~5	~5	~5	~15	~20

Reference: Bentley-Link White Paper 1996 PFC

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Automating part of its process helped this family business boost efficiency and begin producing types of ribbon that were previously not possible.

RIBBON MAKER CUTS MANUAL MACHINE MONITORING BY 30%

>> Cream City Ribbon began more than 100 years ago in Milwaukee making string for the city's bustling leather industry. Fast forward to 2019, and owner Eric Crawford uses the same manufacturing process to make high-end decorative wrapping ribbon that is both beautiful and sustainable.

However, the company needed ways to increase efficiency by automating manual processes typically performed by the person designated as the master ribbon maker. The shop uses a mix of machinery ranging from the early 1900s to the present. Each piece plays an important role, but the ribbon maker is the key.

Throughout each step, the ribbon maker must make sure nothing goes wrong. This becomes especially challenging during the ribbon's time on the accumulator: If the speed is off, it could snap or fall off, requiring it to be respooled, adding extra time to the process.

"Our previous master ribbon maker was a professional dancer, and she would literally dance around the shop checking on things constantly, watching the speed of the accumulator and manually adjusting the speed," Crawford notes.

When the company brought in a new master ribbon maker, Crawford saw it as an opportunity to identify ways to increase efficiency. The new ribbon maker was spending about 40% of his time adjusting the speed or fixing other things that went wrong — time Crawford knew could be better spent on other tasks.

Unique Ribbon Making Process

Rather than weaving the yarn strands, Cream City uses an adhesive to bond 55 individual strands together, which makes them stronger than your average ribbon. The company sells custom and stock ribbon to large and small specialty gift retailers and individual customers. This makes for an array of variation in the product. Spools leaving the facility on any day can differ in width, color and print pattern.

No matter what the final touches are, the process always begins the same way.

First, the ribbon maker adheres the strands together and then sends it through large drying wheels. Once dry, the ribbon goes through an accumulator station, which moves it up and down to ensure it remains flexible so it doesn't snap. Finally, the ribbon maker adds the decorative touches such as crimping the ribbon or adding a polka dot print.

Connections to Collaboration

When Crawford was ready to learn about automation options for his shop, he knew who to call. Carl Penner of Revere Electric, a Designated Allen-Bradley® Distributor, went to grade school with Crawford, and they had worked

together on factory needs in the past. He also volunteered on a local environmental nonprofit board with Blake Moret, CEO of Rockwell Automation.

"We wanted to stay as true to the artistic process as possible, but we knew that some elements could be automated without impacting the integrity of the ribbon," explains Crawford.

Penner and the Revere Electric team visited the shop to determine the best way to automate the accumulator station and drying wheels. They identified a solution that included Allen-Bradley Bulletin 45DMS distance measurement sensors and Allen-Bradley PowerFlex® 523 AC drives from Rockwell Automation. The sensors can monitor if ribbon is too loose or too tight, and the drives can speed up or slow down the accumulator in response, helping avoid extra slack or snapping the ribbon.



Teams from Rockwell Automation, Revere Electric and Cream City Ribbon fine-tune the automation of a 100-year old ribbon-making process.

Crawford's team mounted the sensor and did most of the wiring. Revere Electric then programmed the drive, connected it to the sensor and made sure everything was compatible.

Focusing on What Matters

The ribbon maker went from spending 40% of his time adjusting the accumulator, to spending just about 10% of his time monitoring the system. Crawford is pleased with the results so far and is happy that his small team now can focus on what really matters — the art of making beautiful ribbons.

The company's shop has three ribbon-making systems, and two are now automated. If business calls for it, Crawford plans to automate the third one. The increased efficiency already has helped expand the business, as they are now able to produce a new type of ribbon — the Eco Flat String, which is similar to string made by the original shop more than 100 years ago. □

HOW A TOYOTA ENGINE PLANT SLASHED ENERGY COSTS

New air compressor controls are saving 1 million KWh annually and support Toyota's zero-emissions goals.



You've heard of emission-free vehicles. But what about emission-free vehicle production?

That's the vision of Toyota, one of the world's largest automakers. Its Toyota Environmental 2050 Challenge calls for the company to remove CO₂ emissions from its global production plants by 2050.

To meet these ambitious goals, Toyota is taking steps to both reduce its energy usage and move to renewable energy. And as evidenced in the company's Huntsville, Alabama, plant, these efforts are helping Toyota not only shrink its environmental footprint, but they're benefitting the bottom line.

Inflated Energy Costs

The Huntsville plant makes engines for popular Toyota vehicles such as the Tacoma, Tundra and Highlander. Workers at the plant receive engine components that have been cast at other facilities to machine and assemble them into the engines that will go into vehicles at yet other facilities.

The plant's air compression system is crucial to the production process. Comprised primarily of five large centrifugal air compressors, the system provides air across the 1.2 million-sq.-ft. plant for various machine processes, automation and drying engine components.

Compressed air systems are energy intensive by nature. The system at the Huntsville plant is no exception; it accounts for 25% of the plant's annual energy costs.

The legacy controls made the system an even bigger energy user than it needed to be. The aging controls were slow to start up the compressors and didn't allow them to work together as an integrated system. They also didn't have enough compressed air storage to draw from during high peak air demands.

Because of these limitations, team members had to keep compressors online more than necessary for most of the day to guarantee enough air capacity to ride through short, occasional demand surges in the plant.

"We need a minimum of 81 psi for machines to run without stoppage," says Eddy Kiggen, a facility specialist at Toyota. "But because the compressors took so much time to start up, we had to maintain 91 psi just to make sure we didn't fault out at 81 psi low compressed air pressure."

The plant's electrical contract created more challenges. The contract charges more for energy consumed during peak usage hours. When team members needed to start one of the large compressors during these times to keep the plant at capacity, a single machine start-up could increase the plant's electricity bill by 100% of one day's energy charges.



Local and Plantwide Upgrades

To help rein in energy costs and support its 2050 energy initiative, Toyota Motor Manufacturing, Alabama (TMMAL) decided to upgrade the plant's air compressor control systems.

For the job, Toyota asked for help from Rockwell Automation OEM Partner Case Engineering and IZ Systems, a supplier of compressed air vacuum systems and equipment. Together, they delivered a two-part solution that included local and plant-wide controls.

Locally, Case migrated the controllers on the five large compressors to its AirLogix control solution. It's based on the CompactLogix™ control platform from Rockwell Automation and includes an Allen-Bradley® PanelView™ Plus 7 operator interface to give workers performance and diagnostics data at each compressor.

At the plant level, Case used its AirMaster load-sharing solution to create a master air control system, which is based on the Rockwell Automation ControlLogix® platform and uses the FactoryTalk® View SE software for data collection and visualization. Case worked with IZ Systems, which also installed a 5,000-gallon storage tank for boosted compressed air of 500 psi to allow the system recovery time without faulting.

A modulating valve delivers air during high air demand periods. This stored air provides a smooth transition when

The new system gives workers trending information to monitor air pressure and flow, energy usage and critical data at each machine, including vibration. And because this information is available in near real time, it helps analyze the compressed air system and help when troubleshooting.

an additional centrifugal machine is required to meet the plant's air demand.

Revving Up Savings

The new, more efficient air compressor controls have helped the Huntsville plant reduce annual energy usage by nearly 1 million kilowatt hours per year. This doesn't include the savings realized by avoiding start-ups during peak-usage hours.

As a result, the plant recovered its investment in the new controls faster than its goal of two years.

"We've been able to reduce our setpoint for the system from 91 to 85 psi," Kiggen explains. "That's where the majority of the savings are on this project."

The updated local controls help the compressors run more efficiently than the legacy controls by increasing the throttle

capacity from each machine. The new master controller monitors pressure, and air flow will start or stop compressors to match demand. It will draw

compressed air from a high-pressure storage tank while a compressor comes online, ride through demand surges and protect against potential issues.

“The way it’s set up now, we always have enough pressure in the storage tank for any dips or compressor failures,” Kiggen says. “Even if the next compressor we try to start fails, we can start yet another compressor, and people on the plant floor won’t know anything happened.”

The new system gives workers trending information to monitor air pressure and flow, energy usage and critical data at each machine, including vibration. And because this information is available in near real time — something team members previously didn’t have — it helps to analyze the compressed air system and assist when troubleshooting.

Team members can view the information locally at each machine as part of their routine operations monitoring. Toyota and Case Engineering can view it from anywhere using remote access.

“After electricity, air is the most important utility we have, so we keep a close eye on it,” Kiggen says. “I look at the data daily to see how the system is performing and to review its efficiency. I get a text message if we have an issue, like a pressure drop or the storage tank falling below a certain level. We also like having Case connected and let them know of an issue so they can get online to fix the problem right away.”

Toyota is looking at replicating this project elsewhere for similar energy savings while continuing to drive toward zero CO₂ emissions.

“Producing zero CO₂ in the process of building a vehicle is a very big task,” Kiggen says. “Right now, we’re trying to save as much energy as possible before we jump into renewables. And for this plant, these control upgrades are the most successful energy projects we’ve done in a long time.” □

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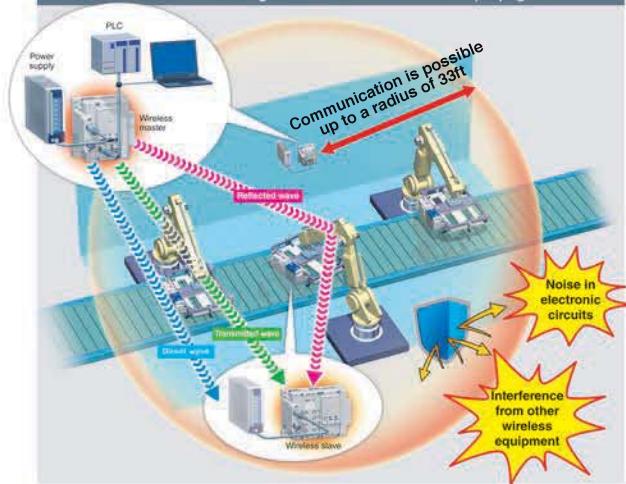
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What would a world without internal combustion engines look like? While this isn't the current reality, changes in legislation and consumer habits are driving this global shift in a major way.

If you're an electric vehicle start-up, you're already looking past gas-powered engines and working to build the all-electric fleets of the future. Or, if you're a mature automaker, your journey to building all-electric vehicles is probably a long road that first involves shifting your current operations to incorporate hybrids.

Powertrain manufacturing systems are sophisticated. So, whether you're building electric drivetrains or hybrid powertrains, you need the same thing: flexible and scalable production operations. Not only do they help adjust production to keep up with the demand for electric or hybrid vehicles, but they also help confirm you're equipped for future technology advancements.

To create scalable and flexible powertrain or drivetrain operations, incorporate these three elements:

1. Connected Plant

Vehicles are changing, and production must change with them. That's why progressive automakers are unifying their manufacturing and IT operations to create more connected plants.

Connected, information-enabled plants launch faster and perform better. It allows you to measure and analyze almost any aspect of production to help operators make informed decisions. Processes can be simulated to improve training and validate line changes before they're made. You can blend the physical and digital aspects of your operations to help staff work more efficiently and see production in new ways.

Also, connected plants can do more than improve production — they can transform it. By connecting everyone from the consumer to your suppliers to your plant work-

ers, you can deliver personalized cars that are as unique as the people who drive them.

Realizing these capabilities calls for connected plants to include a robust network foundation designed for reliability, scalability and security. Connecting workers and verifying they can access important data in real time requires plants to incorporate Industrial Internet of Things (IIoT) technologies.

For help with building connected operations, take advantage of freely available resources such as the Converged Plantwide Ethernet (CPwE) design guides from Cisco and Rockwell Automation. Then, work closely with a system integrator that can help guide your unique path to a connected plant.

2. Scalable, Digital Solutions

Imagine software that can turn raw production data into useful information for operators. Not only would this help save time and money but is a necessity in current automotive operations.

However, too often, automakers are hesitant to adopt more modern, high-value software and digital solutions. As a result, they continue to use home-grown solutions that can't achieve operational needs or internal customer expectations. They're difficult to integrate with other systems and challenging to scale as operations either grow or evolve.

That's why it's essential to use software that can grow quickly with your operations.

Scalable analytics software, for example, can help you become more efficient while dealing with the constant changes in powertrain and drivetrain technologies. The software also helps protect the quality of electric or hybrid vehicles by tracking critical points in the production process — from raw material usage to battery assembly to finished-good performance.

3 KEYS TO FUTURE-PROOFING AUTOMOTIVE PRODUCTION

Connected, flexible and scalable powertrain or drivetrain operations can help you keep up with demand and adapt to inevitable technology changes.

By Bill Sarver, senior consultant, global automotive industry, Rockwell Automation

Analytics software also can use new, disruptive technologies to change how you monitor and manage production. Being able to identify and solve these problems before they happen is one of the major benefits of this software. It can use machine learning to predict production outcomes, such as machine failures or quality issues.

Analytics software also can use augmented reality (AR) to change how plant workers do their jobs. An operator, for example, could use an AR headset or tablet to identify bad batteries that get digitally flagged in the AR environment so the operator could remove those batteries from production.

Scalable manufacturing execution system (MES) software is equally critical. It can automate data collection and drive decision-making to help manage complexity, especially as your services grow or evolve.

An MES can manage production from order initiation to final assembly to help reduce the work in process. It can also make sure that materials are available for planned production sequences to keep lines moving, and can use enforceable instructions to help make sure workers build vehicles to spec.

An MES also allows you to create a digital genealogy for every vehicle that can be tracked and traced through both your plant and the supply chain. No matter what stage pro-



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duction is in, this system can help you identify, investigate and resolve potential vehicle quality and safety issues.

3. Flexible Production Technologies

Hybrid and electric-vehicle sales are steadily growing and expected to account for 30% of vehicle sales by 2025, according a 2018 report by J.P. Morgan. That's why you need production technologies that can help keep up with demand.

If you're an electric-vehicle start-up, you need drive-train operations that can transition from low-volume to high-volume production based on demand. For example, an assembly cell system concept allows you to build flexible, highly standardized assembly lines using machines that can run semi-automated for current needs, then transition to fully automated later when production ramps up.

If you're a mature automaker, you might need to create more flexible and modular powertrain production operations that can support both traditional and hybrid vehicles. Pre-engineered integrated automation solutions can help create fast and flexible powertrain operations.

An automation-based design and configuration solution such as the Rockwell Automation Production Performance Builder (PPB), helps enable more flexible manufacturing through faster line reconfiguration. Normally, this process would take a large amount of time, but by applying this new solution, powertrain lines can be rebalanced and reconfigured within a day.

For powertrain assembly plants, a configurable line can help achieve optimal line balance even as you deal with changing technologies, more production models and fluctuating capacity. This new addition translates to lower overall operational costs and can help reduce production bottlenecks. Also, for powertrain equipment suppliers, a design and configuration tool helps achieve design repeatability and appropriate system sizing from the outset.

Future-Proofed Production

Hybrid and all-electric vehicles will someday constitute most cars on our roadways. However, we can't predict how consumer preferences will evolve or how technologies like batteries and fuel cells will change before we reach that day.

With a connected plant strategy, scalable software and flexible technologies in hand, you can build flexible and scalable powertrain or drivetrain production operations that can adjust to future technology and demand changes. This will help make the road to an all-electric future a smooth one. □

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GET READY TO ATTEND AUTOMATION FAIR... AT HOME!

This year's event is online and offers a unique experience while still sharing the latest IT/OT and control technology and best practices.

➤➤ With a global pandemic that just won't go away, the 2020 Automation Fair® event will look different this year. From November 16-20, set aside your dress shoes, slip on your comfy slippers and loungewear, grab a snack and your laptop or tablet, and settle into the couch in your living room. Join us for Automation Fair At Home.

The 2020 Automation Fair At Home experience will include technical training, product and technology showcases, customized demos for customers, industry forums, keynotes, a unique trade show experience and more. Registration and event details will be available in September.

Just think: you won't have to spend hours on a plane, wear a mask, walk for miles or spend long hours on the show floor shaking hands and searching for breath mints. Instead, you'll feel energized while you drink coffee from your favorite mug, ready to log in to this exciting new online experience — Automation Fair At Home.

You Matter

After hearing thoughtful feedback and insight from its partners and distributors regarding the evolving global pandemic and its impact on businesses, Rockwell Automation decided to launch the 2020 Automation Fair At Home — a primarily virtual event with options for unique, hands-on, on-site experiences at its Milwaukee headquarters, conditions permitting. The decision also is consistent with the company's effort to prioritize the health and safety of its employees, customers, partners and distributors.

And just as COVID-19 conditions change daily, Rockwell Automation will be introducing new elements to the Automation Fair at Home experience throughout the next few weeks, so watch for announcements at www.automationfair.com.



While looking a little different from previous Automation Fair® events, this year's experience still will be jam-packed with information. Experts from Rockwell Automation and members of its PartnerNetwork™ program will share how you can use technology as a competitive advantage to get your products and services to market faster, reduce costs, use power and plant-floor assets more efficiently, and minimize risks in your manufacturing environment.

And There's More

In conjunction with Automation Fair At Home, Rockwell Automation also will host the Process Solutions User Group (PSUG) on November 16-20. You can join your peers during this interactive online event to gain greater insight into the latest process automation technologies.

>> Checklist for Automation Fair At Home

- ✓ Shower: not necessary
- ✓ Ball cap to hide your unkempt hair: check
- ✓ Jammies: check
- ✓ Slippers: check
- ✓ Kids on their iPads: check
- ✓ Comfy chair on your deck: check
- ✓ Chew toy for the dog: check
- ✓ Food delivery app ready to order lunch: check
- ✓ Favorite beverage: check



Through thought-provoking keynotes, insightful technical and customer application sessions, and more, PSUG addresses the production challenges you face every day, including control strategies, optimization and process safety.

Process control engineers, plant managers, operators, manufacturing IT professionals, integrators and EPC consultants will want to take advantage of the sessions highlighting innovative approaches, outstanding ROI, and successes achieved through Rockwell Automation solutions.

Attendance is Free

The Automation Fair At Home event is free. Registration opens in early September. Visit www.automationfair.com for registration information, or contact your local Rockwell Automation representative. Then in November, get casual and comfortable, and enjoy the experience. □

>> Join Us via Social Media!

You also can stay connected with the Automation Fair At Home through social media:

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Editor's Note: This article is adapted from the white paper, "Electric Linear Actuators in Food and Beverage Equipment Applications." Download the full paper at <https://bit.ly/2020nookwp> to learn about the fundamentals of applying DC motor-driven electric linear actuators to food and beverage applications. Also get comprehensive information about linear actuator design, hygienic design requirements, and types of linear motion solutions suitable for various applications.

>> Food production is a key market sector that will receive significantly more focus on a global scale as we emerge from the current COVID-19 situation. More efficient farming, harvesting and production are critical to keeping stocked shelves, refrigerators and freezers in our supermarkets.

As agriculture and food equipment manufacturers prepare for this by upgrading and redesigning their machines, it's important to consider the most efficient and environmentally safe linear motion solution.

Applications That Require Linear Actuation

These are some of the most common food and beverage process operations that use linear actuation.

Filling. Filling applications typically require faster machine operation in hygienic environments. In addition, equipment must provide highly accurate fill control while adapting to varying bottle heights to reduce changeover time. This can include both volumetric and

HOW DO YOU KNOW WHICH ELECTRIC LINEAR ACTUATOR TO USE?

Learn what to look for designing an electro-mechanical system to optimize food and beverage processes, including the basics of key hygienic requirements.

By Nicholas Novotny, product line manager, Nook Industries

piston operation. Bottles, cups, bags and containers are some common examples of items to be filled.

Cutting and Slicing, Chopping, Mixing and Extruding. These operations are fundamental for food processing equipment operations. In addition, they require a high degree of precision, flexibility and safety. Hygienic factors play an increased role here, because the equipment is in much closer proximity to the food or beverage being processed. Additional types of processing operations include deboning, meat processing and blenders.

Conveyors, Aligning, Packing and Sorting. Various linear actuators are routinely used to properly adjust conveyors and aligning and sorting positioning devices. These can include different environmental conditions, such as indoor, outdoor, heat, cold or messy.

The processing equipment on the conveyor system may require adjustment, such as a heavy heating element. Or, the products themselves might require repositioning as they travel down the conveyor system, such as bottled water. Some typical specialized operations include conveyors, ovens, separators, handling, palletizing, pick and place, and packaging.

Open and Close Lids, Stacking, Emptying and Pressing. Linear actuators are ideal for opening and closing lids of any size safely, hygienically, and with easy washdown clean-up. Many of these applications require multiple lanes to independently index lines of food products for optimal throughput and accuracy while maintaining product integrity, quality and safety.

Other functions that require linear motion include doors, hatches, safety devices and emptying containers.

Regulatory Basics of Hygienic Design Requirements

Standard design guidelines have been developed to help ensure food processing machinery can be properly cleaned and sani-

>> Download the White Paper

Visit <https://bit.ly/2020nookwp> to download the full white paper, "Electric Linear Actuators in Food and Beverage Equipment Applications," from Nook Industries. Learn about the fundamentals of applying DC motor-driven electric linear actuators to food and beverage applications. Also get comprehensive information about linear actuator design, hygienic design requirements, and types of linear motion solutions suitable for various applications.

The requirements and testing to meet the IP69K rating for an electric linear actuator has translated well into the food and beverage industry where washdown operations and hygienic classification often are required.



tized after every use. The pertinent governing bodies include 3-A Dairy and U.S. Department of Agriculture (USDA).

The IP (Ingress Protection) Rating system was originally established by the IEC 60529 standard. The first digit, IP-XX, equates to Solid Particle Ingress Protection. The second digit, IP-XX, equates to Liquid Ingress Protection. Download our white paper at <https://bit.ly/2020nookwp> to see useful tables showing what each digit represents.

Recently, it was determined that the prior highest rating of IP68 still wasn't sufficient for enclosures that were regularly exposed to high pressure or high temperature environments, such as those in washdown applications.

Therefore, a special IP rating of IP69K was created, originating from the German DIN 40050-9 standard (for road vehicles exposed to routine intensive cleaning).

The requirements and testing to meet the IP69K rating regarding waterproofing exceed those seen with the NEMA 4X rating. However, the new standard has translated well into the food and beverage industry where similar demanding washdown operations — and hygienic classification — often are required (see **photo**).

In addition to high pressure and high temperature, some applications also require cleaning agents to achieve specific hygienic conditions. Typically, IP69K rated linear actuators are specially designed to meet these stringent requirements.

Consider the Big Picture First

When engineers are designing an electromechanical system that uses electric linear actuators versus other technologies, there can be multiple ways to solve one application. All variations differ in accuracy, performance, space (footprint), total cost of ownership and other factors. Therefore, it's important to consider the big picture of your operations and objectives, and not just focus on product specifications alone. □

Nook Industries, Inc., is a participating Encompass™ Product Partner in the Rockwell Automation PartnerNetwork™ program. Based in Cleveland, Ohio, the company provides a complete line of linear motion products, including ball screws and linear actuators.



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Editor's Note: This article is adapted from the white paper, "Advantages of Using Rugged Integrated IP67 Cameras in Industrial Applications." Visit <https://bit.ly/tj2020imperxwp> to download the full paper to learn about the IP67 rating, the importance of each camera component in IP67 solutions, and how an integrated IP67-rated camera functions in harsh industrial applications.

>> Today, cameras are found almost everywhere, from the intrusive devices we carry around, to doorbell cameras, to rear-view cameras in vehicles, to cameras and imaging systems used in industrial applications worldwide and so on. Standard industrial cameras,

however, aren't built to withstand severe environments with high shock and vibration, wide temperature ranges, high particulate content and water ingress.

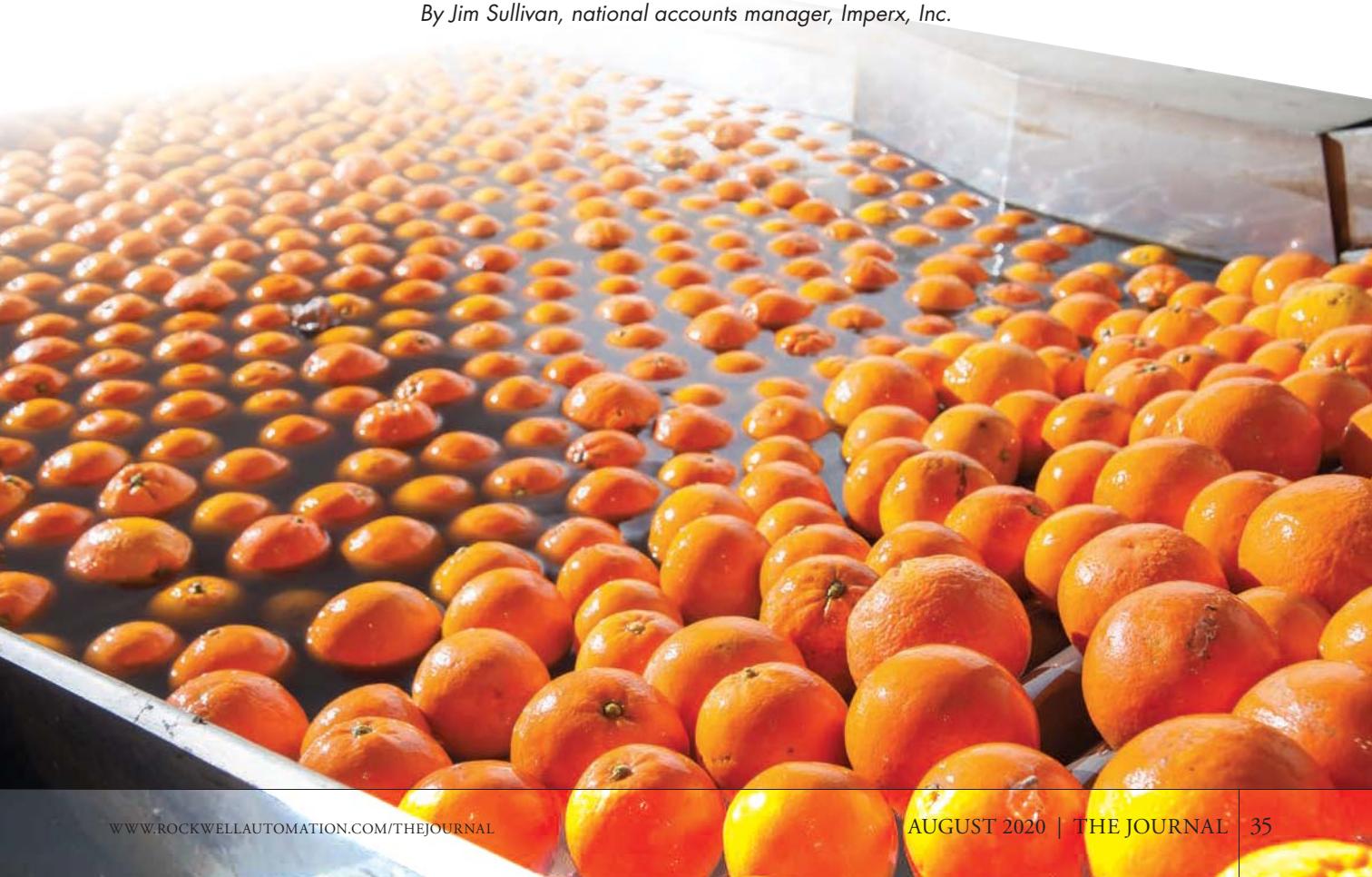
Industrial machine-vision camera manufacturers take different approaches to protect cameras from the elements. One option is to place a camera inside an IP-rated enclosure. The user buys the camera and enclosure from two different companies, then someone determines how to place the camera inside the enclosure and connect it to the computer.

A second approach is to have the camera manufacturer integrate the IP67 compliance into the camera itself. An integrated IP67 camera solution (see **photo**) simplifies the camera's protection with minimal impact on size and cost.

WHAT IS AN IP67-RATED MACHINE VISION CAMERA?

Here's what IP67 means, and how the IP67 rating protects a camera from dust and water ingress, temperature extremes or high shock or vibration.

By Jim Sullivan, national accounts manager, Imperx, Inc.



There's no need for a separate enclosure, and users can obtain the IP67-rated camera from a single supplier.

What is an IP Rating?

The International Electrotechnical Commission (IEC) developed the "Ingress Protection" standard to give a measurable way to define concepts such as "waterproof" or "dustproof." Two digits define the IP for a device.

The 1st digit, which relates to "Solid Ingress Protection," defines the level of protection the enclosure provides from contact with objects inside the enclosure and the ingress of solid foreign particles (dust) into the enclosure.

The second digit of IP relates to "Water Ingress Protection." It defines how well an enclosure prevents water from entering the enclosure. The range of water protection goes from 1, where there is protection against dripping water, up the scale to protection from water ingress at increasingly higher pressures. From water flowing down a grade and hitting the enclosure, to sprayed and splashed water, to protection from jet streams of water, finally "7" and "8" allows for completely immersing the enclosure or device in water.

Therefore, the IP67 rating for machine-vision cameras means the camera is protected from ingress of dust, and it can be submerged to depths up to 1m for up to 30 minutes without affecting camera use.

When using an integrated IP67 camera solution, it's a best practice to understand the type of cabling that will be used to maintain compliance, the enclosure options available to surround and protect the lens to accommodate

This integrated IP67 solution has protection built directly into the camera.



>> Download the White Paper

Visit <https://bit.ly/tj2020imperxwp> to download the complete white paper, "Advantages of Using Rugged Integrated IP67 Cameras in Industrial Applications," from Imperx, Inc. Learn about the IP67 rating, the importance of each camera component in IP67 solutions, and how an integrated IP67-rated camera functions in harsh industrial applications.

varied sizing needs, and the way the lens enclosure can affect the resolution of the final image from the camera. You can learn about all this by downloading our white paper at <https://bit.ly/tj2020imperxwp>.

Industries and Applications

Some markets where use of an IP67 camera is ideal include oil and gas, transportation, automotive, aerospace, manufacturing, security, military and more — any place that isn't a pristine environment.

For example, the food and beverage industry has areas where there is extensive cleaning, such as regularly washing an area with disinfecting solutions, and some splash zones will exist. IP67 protection can also help automotive and other manufacturing industries such as machining and metal processing where gases, sparks, metal particles, dust, oil and solvents can be present.

The IP67 enclosure is dustproof, but it should not be used in environments where the camera needs to be explosion proof. That is entirely another spec and solution, and not part of the IP rating scale.

Evaluate Environmental Conditions

When choosing a camera, particularly for harsh environments, be sure your camera is protected and will survive in whatever conditions you may have. Consider what type of contaminants the camera will need to endure; choosing IP67-rated products will offer protection from dust and water ingress, temperature extremes or high shock or vibration without breaking the bank. □

Imperx Inc., based in Boca Raton, Florida, is a participating Encompass™ Product Partner in the Rockwell Automation PartnerNetwork™ program. Imperx designs and manufactures high-performance cameras, process video recorders and frame grabbers.

ENCOMPASS SHOWCASE

What's the Best Way to Connect Your PLC to IIoT Business Apps for Analytics?

tManager is the only CompactLogix™ PLC module that connects the PLC directly to your enterprise SQL database, favorite analytics package, dashboard projects, track and trace, recipe download, high-speed sorting, and quality monitoring app. Eliminate the connectivity server in the middle and custom coding and use tManager, the built-for-purpose PLC in-chassis connectivity module, for bidirectional data movement between IT and OT. Here's the "how to" video series: <https://bit.ly/3aVJURk>



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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 PLCs 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.racom.com/allen-bradley.



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SYTECH INC.

Small and Mighty EIP Single-Channel Weight Processor

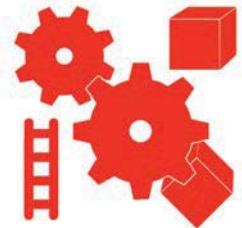
Hardy's new HI 6200 series are ultra-compact, single-channel weight processors featuring EtherNet/IP™, IIoT compatibility, remote diagnostics and a user-friendly, color touch screen interface. Ideal for OEMs and systems integrators, the HI 6200 allows for high-density panel design over traditional weighing instrumentation, reducing both machine cost and control-cabinet footprint. Learn more at <http://bit.ly/hardyhi6200>.



HARDY PROCESS SOLUTIONS

Free Sample Programs

AMCI provides free, downloadable sample programs for many of their Rockwell Automation-compatible products, including their PLC Plug in modules and EtherNet/IP™ devices. These programs are written using Studio 5000® and RSLogix 500® and easily can be incorporated into new or existing ladder logic programs, making adding AMCI products to your system a quick and efficient process. Download your free sample programs directly from AMCI at <https://bit.ly/AMCISample>.



ADVANCED MICRO CONTROLS INC. (AMCI)

Configure a PLC or Machine Remotely

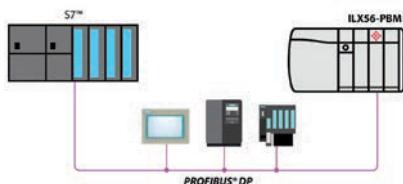
The Ewon Cosy from HMS Networks is an industrial VPN router that offers the ability to troubleshoot your machines remotely without going on-site, drastically reducing support costs and improving machine uptime. <https://ewon.biz/products/cosy>

HMS NETWORKS



>> PROFIBUS In-Chassis Modules for ControlLogix

Encompass™ Product Partner **ProSoft Technology** has added two new PROFIBUS in-chassis modules for Rockwell Automation ControlLogix® control systems. Premier integration tools and each module's PROFIBUS® DP packet capture utility helps users reduce configuration time.



The ILX56-PBM PROFIBUS DPV1 Master/Multi-Slave module allows ControlLogix processors to communicate with various PLCs and devices using the PROFIBUS DP protocol. As a PROFIBUS DP

Master, the module can transfer up to 5,000 bytes of cyclic I/O data with various slave devices on the network.

The module also serves as a multi-slave, where it can emulate up to 10 individual nodes on a PROFIBUS DP network, allowing for more cyclic I/O data transfer.

The ILX56-PBS PROFIBUS DPV1 Multi-Slave module allows ControlLogix processors to communicate on a PROFIBUS DP protocol network by emulating up to 10 individual slave devices. This multi-slave support of the module provides the ability to pass up to 2,440 bytes of input and output data as high-speed cyclic I/O data on a PROFIBUS DP network.

>> Machine Performance Monitoring App

Encompass™ Product Partner **HMS Networks** offers the eCatcher Mobile KPIs for live mobile monitoring of key performance indicators from any machine equipped with an Ewon Flexy router. By using a mobile device with the eCatcher Mobile app installed, users get a live look into their machines' status and performance from anywhere in the world.

The mobile version for iOS and Android is based on the secure eCatcher software, which establishes remote connections to Ewon-connected machines via the cloud service Talk2M.

Users can select up to six KPIs from the list of defined machine variables inside each machine-connected Ewon Flexy, and set KPIs to trigger alarms.

After a few configuration clicks, a live view of the chosen KPIs helps users instantly monitor machine status and performance from anywhere.



Users can review any active KPI alarms and the degree of severity through an intuitive color indication of alarm status. If a machine reports a critical alarm, the user can instantly create a remote VPN connection over Talk2M to the machine in question for quick intervention.

>> PRODUCT SPOTLIGHT

ProposalWorks Standards Builder Tool

The **ProposalWorks™ Standards Builder** from Rockwell Automation is an application designed to assist end users with generating, customizing and maintaining their control standards. Engineers can document project standards, track revisions and more to help establish consistency from project design through procurement and commissioning.



Although Standards Builder is its own capability, users launch the application via the ProposalWorks tool. They can output detailed specification documents and a standards BOM that can be uploaded into ProposalWorks. They can share this with others, including suppliers, to help product design and selection.

Control standards creation and maintenance can be a manual and time-consuming process, and users can be unaware of changes in life-cycle status and product obsolescence after a control standard is published. With Standards Builder, users will spend less time maintaining control standards or specifications and also achieve more detailed content that is easier to maintain than in a static document.

In addition, users can attain a higher standardization of systems, resulting in fewer spare parts, less training and more reliable designs. They can easily add product lines or products to their standards or specs, allowing better product availability and alignment with suppliers during design/build.

>> Cable Entry Plates

Encompass™ Product Partner **icotek** has expanded its range of cable entry plates with the KEL-DP 25 version A and KEL-DP 32 version A and B. The new products fit metric standard cutouts M25 and M32.



Depending on the model, up to 13 different cables can be inserted. The plates suit cables with diameters between 5.2 and 8 mm. After gently piercing the membrane, the cable can be passed through. The icotek plug ST-B can close a punctured membrane that is no longer required. It is installed tool-free by simply snapping it into the cutout. The integrated spring bars also center the position of the KEL-DP.

The KEL-DP 25s are available in version A (for sheet thicknesses from 1.5 to 2.5 mm). The KEL-DP 32 are available in version A (for sheet thicknesses 1.5 to 2.5mm) and version B (for sheet thicknesses 2.8 to 4.0mm). Construction height is 5mm.

The KEL-DP 25s are available in version A (for sheet thicknesses from 1.5 to 2.5 mm). The KEL-DP 32 are available in version A (for sheet thicknesses 1.5 to 2.5mm) and version B (for sheet thicknesses 2.8 to 4.0mm). Construction height is 5mm.

The new cable entry plates have certifications such as IP65 (certified according to DIN EN 60529: 2000-09).

>> Mobile Device Accessories for Harsh Environments

Encompass™ Product Partner **Pepperl+Fuchs** expands its ecom brand of mobile device offerings for harsh environments with new charging and carrying solutions. The accessories are designed for use with the smartphone Smart-Ex 02 and Ex-Handy 10.

A mounting plate allows the 5-in. (12.7-cm) display of the Smart-Ex 02 to be mounted exactly where the mobile worker needs it for the current job. This provides safe, hands-free operation during every step of the work process, even in narrow spaces or on ladders.

The smartphone also can be securely attached to a worker's arm, belt or cradle for direct view of work orders and messages without restricting freedom of movement. The belt clip and hand loop hold the device securely on the worker's body.

Other accessories in the line include the Ex-BP S02 battery pack, the TC S02 travel charger for global use, and the DS S02 docking station with a pogo pin plug that resists shocks and vibrations. The charging cable PC S02 charges the equipment.



>> PRODUCT SPOTLIGHT

Turbidity and Suspended Solids Sensor

Rockwell Automation Strategic Alliance Partner **Endress+Hauser** offers the Turbimax CUS50D sensor. The absorption sensor measures for turbidity and suspended solids in unfavorable environments and is made to withstand aggressive media.

The sensor can be used in a range of applications including those in the chemical industry, food industry, and in industrial wastewater. The plastic version of the sensor is resistant to chemicals for measurements in media with a low pH value or high salt content. Digital signal processing in the sensor and Memosens protocol help deliver reliable measurement results.

The sensor can be quickly and easily put into operation. The measuring principle is based on the attenuation of light; results can be achieved, for most applications, from a single-point calibration. The sensor also is already precalibrated

for turbidity and absorption measurements and includes various application models.

A Teflon-derivative sensor measurement surface minimizes the risk of dirt accumulating, thus providing a stable and consistent measurement. The sensor's air-cleaning system removes surface contamination so maintenance intervals can be planned, and turbidity measurements can continue uninterrupted over a long period of time.



>> Servo Sizing Software

Encompass™ Product Partner **WITTENSTEIN's** updated cymex sizing software allows users to upload their motion profiles into the Rockwell Automation Motion Analyzer software tool in just a few clicks. Available for rotative and linear applications, the function can be accessed from the measurement curves of the first dial gauge after the application.



Motion Analyzer is a comprehensive motion-application sizing tool used for analysis, optimization, selection and validation of the Kinetix® motion control system. This software's tools help users quickly design

and validate new machine concepts without purchasing or installing physical equipment.

The cymex 5 allows any number of axes to be defined at once. It also now permits several axes and variants to be analyzed and evaluated simultaneously in a single project, saving up to 60% of design time. The software's database includes 14,000+ motor versions from more than 50 different manufacturers and aligns this information with the WITTENSTEIN portfolio of gearboxes and linear systems.

>> Expanded Safety Controller Line

Rockwell Automation expanded its family of safety controllers with the **Allen-Bradley® Compact GuardLogix® 5380 SIL 3 controller**.

Engineers now can scale applications up to and including SIL 3/PL performance with 1oo2 architecture. This flexible option to right-size a safety control system to an application based on its safety assessment helps reduce design and acquisition costs. The scalability of the controllers also allows companies to improve machine performance.

The increased processing power in the controller enables faster reaction times and shorter safe distances. This can help create smaller machines, save valuable floor space and increase operator efficiencies.

Having one high-performance controller for both standard and safety control also helps improve productivity and reduce system cost, complexity and cabinet size. It allows engineers to mix and match standard and safety I/O in the same chassis.

Embedded Gigabit Ethernet ports provide greater communications capacity for smart devices. This can help engineers meet data-intensive smart manufacturing goals without adding extra hardware. Future-proofing machines is made possible with the availability of easy diagnostics.



>> PRODUCT SPOTLIGHT

Rugged Mobile Computers

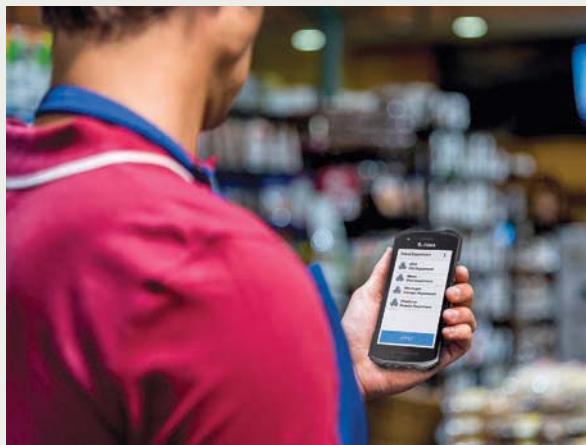
Encompass™ Product Partner **Zebra Technologies Corp.** offers five enterprise-class mobile computers running on the Android 10 operating system (OS): the TC21/TC26, TC52x/TC57x and MC3300x. With integrated scanning and software capabilities enabled by Zebra's Mobility DNA, the new devices are designed to improve front-line worker productivity and effectiveness.

The durable TC21/TC26 mobile computers provide business features and enterprise-class accessories to boost productivity. A common architecture platform allows companies to reuse their existing Android applications on these devices along with Zebra tablets and vehicle-mounted solutions.

The TC52x/TC57x mobile computers feature fast processing and a vivid display for improved text legibility and video experience. These payment-ready devices will help enterprises meet fast-changing demands in various industries.

The lightweight MC3300x mobile computer is available in four form factors with three keypad options. It offers the flexibility needed for use in warehouse distribution centers and manufactur-

ing operations across three shifts with 35% extra battery capacity. It also has enhanced durability including a 6-ft. drop capacity and improved WiFi connectivity, increasing worker productivity.



>> FactoryTalk InnovationSuite Enhancements

Rockwell Automation **FactoryTalk® InnovationSuite, powered by PTC**, a Rockwell Automation Strategic Partner, includes enhancements centered around improved OT/IT integration, enabling customers to contextualize real-time operational data from critical sources such as plant-floor devices, control platforms, and time series-based historians and manufacturing execution systems (MESs).

By automatically integrating the contextualized data and underlying data models into Industrial IoT/Analytics platforms like the PTC ThingWorx® platform, clients can simplify, automate and accelerate OT/IT convergence.

These integration capabilities reduce the data cleansing, aggregation and contextualization work by up to 80%, which accelerates digital transformation deployment. This approach also maintains, enriches and propagates OT data models into IT systems.

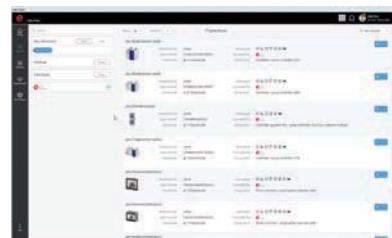
These data models and the underlying information can then be used in developing richer analytic insights and predictive outcomes at the enterprise level.

>> Cloud-Based Data Portal

The newest version of EPLAN Data Portal now integrates into the EPLAN ePulse cloud environment and includes a new user interface with an intuitive search and smart suggestion function. The portal from Encompass™ Product Partner **EPLAN Software and Service** provides users with component and device data for design engineering over the web.

Electrical engineers and fluid design engineers select the device data they need and can transfer it directly into their EPLAN Projects, reducing the efforts needed for design engineering and ensuring standardized data for documentation.

Integrating the EPLAN Data Portal into EPLAN ePulse allows updates to be imported at any time, whether it be in the application itself or in the portfolio of more than 300 component manufacturers that offer around one million devices' data for direct download. Additionally, more than 1.5 million variants of devices can be called up via integrated configurators.



>> PRODUCT SPOTLIGHT

I/O Modules for Hazardous Areas

Industrial producers can more easily and efficiently connect to devices in hazardous areas using the new **Allen-Bradley® 1718 Ex I/O modules** from Rockwell Automation. The intrinsically



safe distributed I/O modules provide EtherNet/IP™ connectivity to field devices in Zone 0 and Zone 1 hazardous areas.

1718 Ex I/O modules can reduce wiring in industrial applications because they can be mounted in Zone 1, closer to field devices in hazardous areas. The modules can also save space with a compact, chassis-based I/O design that contains the primary power supply and an optional redundant power supply in the chassis.

Different chassis options and slot sizes allow users to scale the modules to meet a range of system requirements. Add-on Profiles in the Studio 5000 Logix Designer® application help ease configuration of the modules. A dual-port EtherNet/IP adapter that enables a Device Level Ring (DLR) topology can help improve network resilience.

An ATEX-certified enclosure is required for the modules to be mounted in an ATEX Zone 1 area. As a complete solution, Rockwell Automation collaborates with Encompass™ Product Partner Pepperl+Fuchs, who offers Zone 1 certified enclosures.

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>> HPS Solar Duty Transformers

Encompass™ Product Partner **Hammond Power Solutions'** HPS Sentinel Solar Duty transformers are available for applications where voltage adjustments are necessary between the solar generation system and the utility service.

The nameplate and catalog clearly identify the grid and inverter side of the transformer, allowing for bidirectional power flow for use in facility and utility-interactive generation systems.

The transformers meet the U.S. Department of Energy (DOE 2016) 10 CFR Part 431 efficiency standards and the latest Canadian Energy Efficiency Regulations SOR/2018-201 efficiencies (NRCAN 2019). All HPS low-voltage solar duty transformers are available in a type 3R heavy-duty enclosure and feature enhanced BIL ratings for increased reliability.

Standard integral floor and wall mounting brackets are on units up to 45 kVA allowing for faster installation and voltage ratings range from 15-1,000 kVA with the most voltages in stock.



>> Industrial Computers

The **VersaView® 6300 family of Allen-Bradley® industrial computers** from Rockwell Automation include a range of monitors, box PCs, panel PCs, thin clients and remote connectivity products.

These units are part of the Rockwell Automation IIoT infrastructure capability, delivering IIoT data to where decisions are made in smart devices, on machines and across the plant. The line of products helps improve productivity and efficiency in a Connected Enterprise, particularly at the visualization and data-aggregation point.

Current offerings include the **VersaView 6300B box PC** and the ThinManager®-ready design of **VersaView 6300T thin client PC**.



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What's the best way to connect your PLC to IIoT business apps for analytics?



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Eliminate the server in the middle

tManager is a built-for-purpose, industrial, database and cloud connectivity module

Connect to apps for track & trace, recipe downloads, or monitor production metrics

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Optimize your plant.

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CompactLogix PLCs



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