

# THE JOURNAL

From Rockwell Automation and Our Partners

## Shift into high gear

Rev up your predictive  
maintenance strategy

AUTOMATION  
FAIR 2007  
PREVIEW

AUTOMOTIVE  
INDUSTRY  
REPORT

PROCESS  
AUTOMATION  
SUCCESS

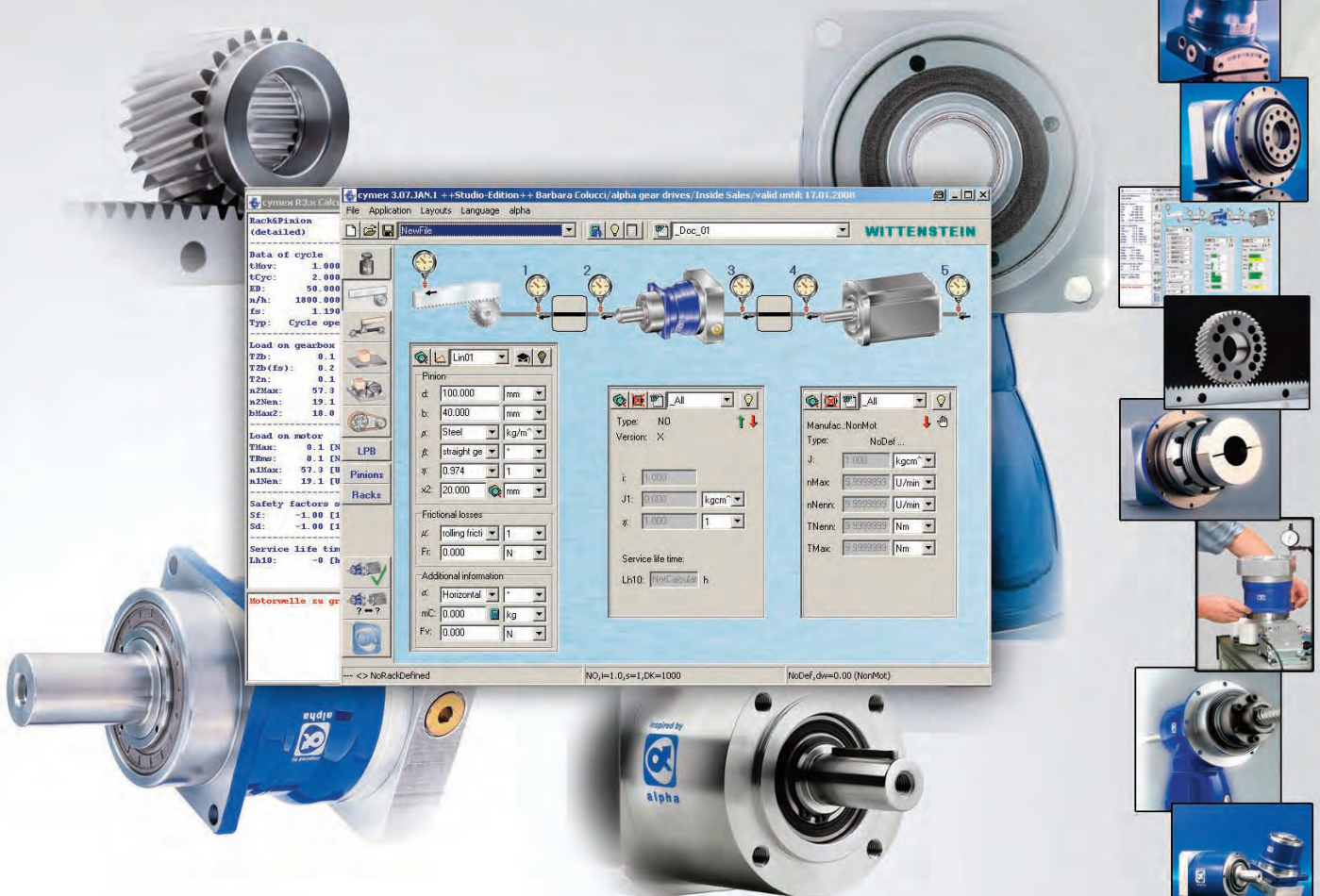
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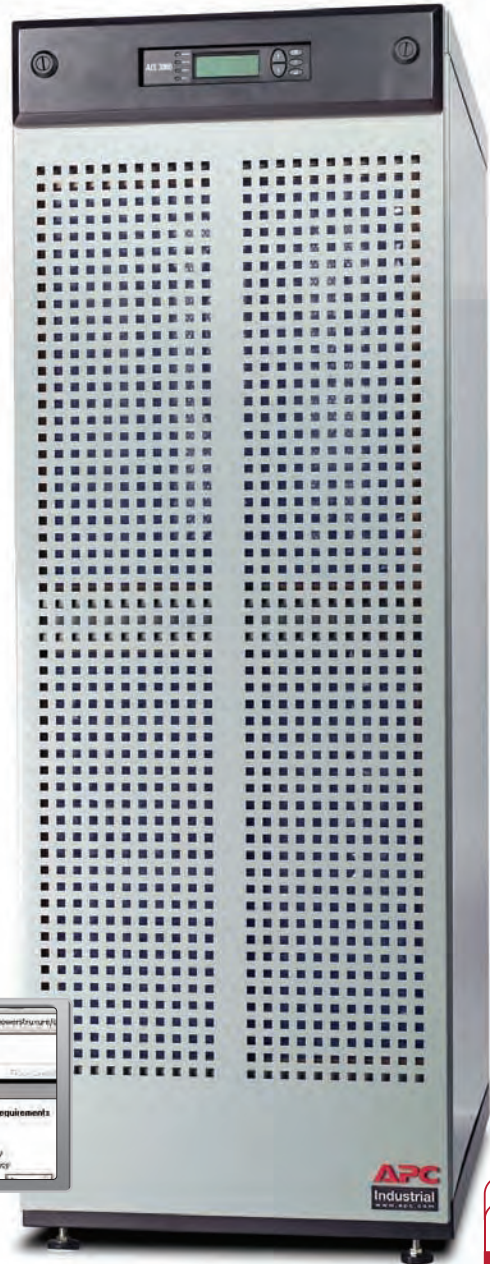
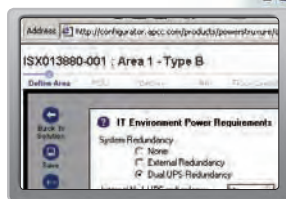
Based on APC's award-winning UPS technology currently in use in numerous industrial applications, the new APC AIS 3000 uses an architecture of modular components in a compact footprint and provides centralized power protection from 10-30KVA for harsh industrial environments.

For industrial applications in the 3-10KVA power range, APC and Rockwell Automation have jointly developed a new line of double conversion on-line uninterruptible power supplies. The new Allen-Bradley 1609-P series complements the existing Allen-Bradley 1609 UPS line that provides battery backup power to critical devices in the control scheme.



For more information on the 1609 UPS line, please contact Rockwell Automation at 800-223-5354, Ext. 1781, or visit <http://www.ab.com/go/1609>

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From Rockwell Automation and Our Partners

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# THE JOURNAL

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## IF ONLY I'D KNOWN



On a dark Friday night in 1986, I set out after working a shift at Baskin-Robbins to drive my compact car 115 miles from Western Illinois University in Macomb, Ill., to my home in Dixon, Ill. I was looking forward to seeing my parents after being away for several months of studying hard and working two jobs.



Halfway home on a lonely back road, my car's timing belt broke. I was stranded. Cell phones didn't exist then. No lights were on at the few farm houses I could see from the road, so I trekked a couple miles to a gas station and called my dad to rescue me.

Turns out, timing belt breakage was a common problem with the model of car I was driving. If I had simply followed the car's maintenance schedule as outlined in the owner's manual, I would've known to replace the belt before it snapped. Too bad there wasn't a dashboard light to alert me to the worn belt — predictive maintenance would've been helpful. Instead, I had to react after the breakdown and pay a lot of money for towing and repairs.

Plant maintenance is similar to maintaining a vehicle. You need to conduct routine preventive maintenance activities on equipment to keep it from failing (if I'd only known about that timing belt!), use predictive maintenance measures to identify and fix potential problems before they occur (my car in 1986 didn't have a dashboard warning light for the belt, but maintenance alerts are readily available for today's manufacturing equipment), and react to unforeseen problems (your equipment failures likely will cost much more than a tow and new timing belt installation).

The best maintenance strategy includes a combination of predictive, preventive and reactive maintenance. Starting on page 18, learn more about how a predictive maintenance program can help ensure maximum reliability and uptime while reducing overall maintenance costs. Until next time ...

Theresa Houck, Executive Editor

# ROCKWELL AUTOMATION HOSTS 100TH TRAVELING MANUFACTURING EVENT

CAOTM has educated thousands of automation professionals since 2001.



The Rockwell Automation Complete Automation on the Move (CAOTM) show brings the experience of the Automation Fair event to automation professionals throughout the country.

»» The Rockwell Automation® Complete Automation on the Move show (CAOTM) celebrated a milestone recently in Las Vegas by marking its 100th show in the United States.

The educational event, which features hands-on labs, technical sessions, partner exhibits and a showcase of Rockwell Automation products and services, has attracted tens of thousands of automation professionals since its inception in 2001. The following are some of the show's achievements.

- »» CAOTM is the world's largest traveling manufacturing educational event.
- »» CAOTMs have been presented in nearly 30 cities throughout the

country, but the event also has traveled throughout the world, including a presentation in a Trinidad open-air rainforest.

- »» More than 100 Encompass Partners and Solution Providers have been involved in CAOTM since it began.
- »» CAOTM brings the experience of the Automation Fair event to automation professionals.
- »» At the first 100 CAOTM events, Rockwell Automation provided free education for more than 37,500 attendees.

**Rockwell Automation CAOTM**  
[www.rockwellautomation.com/events](http://www.rockwellautomation.com/events)  
**The Automation Fair Event**  
[www.automationfair.com](http://www.automationfair.com)

## SCHNEIDER PACKAGING WINS CONTEST

»» Schneider Packaging, a producer of end-of-line case packing and palletizing equipment for manufacturers in the food, beverage, paper, plastics, industrial, replication and personal care industries, was recently named the winner of the 2006 Rockwell Automation Extreme Machines contest. The company was chosen from a national pool of contestants based on the innovation it demonstrated in developing its next generation of machines.

Schneider packaging used Rockwell Automation control system solutions to create an extremely compact, end-of-line robotic handling system for a premium coffee roaster. The machine cartons, labels, case packs and palletizes 280 individual K-cups of ready-to-brew coffee each minute, all within 300 square feet of factory real estate.

To deliver big performance in a small space, Schneider Packaging relied on Allen-Bradley® Ultra™ 3000 servo drives and MPL motors to operate the two side-by-side timing screws



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<sup>(1)</sup> NFPA 70E Annex G 6.1

that count the appropriate numbers of cups for each carton.

Another Ultra3000 drive operates a rotary cartoner, while a series of air cylinders agitate the carton to allow the K-cups to settle properly in the box.

The cartons are sealed, dated and arranged for the casing robot, which assembles and presents the cases to a labeler before loading them onto a pallet. An Allen-Bradley ControlLogix® Programmable Automation Controller (PAC) manages the cartoning, labeling, casing and palletizing processes.

Across the Atlantic, a machine with big scale and even bigger integration was selected as European winner of the Extreme Machines competition. Stork Townsend B.V. was selected based on innovation within its 33-foot by 6-foot by 20-foot sausage maker.

The company standardized on Rockwell Automation technology, including 60 Allen-Bradley PowerFlex® variable-speed drives, 18 Kinetix® 6000 multi-axis servo drives, a CompactLogix™ PAC, and a ControlLogix PAC, to process 4,840 pounds of meat per hour.

Despite the machine's size, a single operator manages it from start to finish.

Rockwell Automation sponsors The Extreme Machines contest and asks

>> Encompass Partner Briefs

**Leviton Gains Business Development Director** Rockwell Automation® Encompass™ Partner Leviton Manufacturing Co. has promoted Chuck Rich to business development director for its Government Business Development Program. Rich oversees sales of Leviton's voice- and data-networking solutions to U.S. government and military installations. He will also oversee joint sales with the government's network of contractors and system integrators. [www.rockwellautomation.com/go/p-leviton](http://www.rockwellautomation.com/go/p-leviton)



Chuck Rich is Leviton's new business development director for its Government Business Development Program.

readers of *Control Engineering* and *Design News* magazines to select the winning machines.

**Rockwell Automation Extreme Machines**

[www.rockwellautomation.com/solutions/oem](http://www.rockwellautomation.com/solutions/oem)

TWO PARTNERS JOIN ENCOMPASS PROGRAM

>> Two more companies have joined the Rockwell Automation® Encompass™ Program, each bringing products to benefit Rockwell Automation technology users.

**Metal Systems Inc.**, Chattanooga, Tenn., offers custom electrical enclosures, equipment centers and operator centers. Patrick Bryan Petty, regional manager for Metal Systems Inc., said he sees the partnership between Rockwell Automation and Metal Systems as a natural fit.

"I feel Rockwell is the best at what they do and Metal Systems is the best at what we do," he said. "Simply put, the relationship between Rockwell and Metal systems is a marriage of quality products."

[www.rockwellautomation.com/go/p-metalsystems](http://www.rockwellautomation.com/go/p-metalsystems)

**Roxtec**, Tulsa, Okla., manufactures cable entry systems such as the Roxtec Gland M63 cable entry seal. Jason Hood, national sales manager for the company, said they joined the Encompass program because, "The desire to put the customer's needs first and the commitment to develop innovative solutions is a core value shared by both of our companies and employees."

Hood hopes that being a member of the Encompass program will bring value to Rockwell Automation customers. "By becoming a Rockwell Automation referenced product, Rockwell Automation will further its commitment to reference innovative solutions for their customers and help provide them with a competitive advantage," he added.

[www.rockwellautomation.com/go/p-roxtec](http://www.rockwellautomation.com/go/p-roxtec)

>> Encompass Partner Briefs

**Alpha gear drives Addresses RoHS** Rockwell Automation® Encompass™ Partner alpha gear drives, Inc., has been applying the Restrictions on Hazardous Substances in Electrical and Electronic Equipment (RoHS) directive to all alpha products since spring. RoHS restricts and controls the content of heavy metals and toxic materials in electronic and electrical consumer equipment. Industrial products such as planetary gearheads are not affected by the new regulation. However, alpha has replaced the lead-containing aluminum alloy in certain parts with lead-free, RoHS-compliant materials that are benign to the environment. [www.rockwellautomation.com/go/p-alpha gear](http://www.rockwellautomation.com/go/p-alpha gear)



Applying the RoHS directive supports alpha gear drive's goal to achieve sustainable development.



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## ENGINEER WINS NEMA AWARD

»» The National Electrical Manufacturers Association (NEMA) recently presented Rockwell Automation Encompass™ Partner Thomas & Betts Engineering Support Services Director George Dauberger with its Kite & Key Award for his volunteer leadership role in the organization.

The award, which recognizes individuals who have advanced the interests of the electrical industry through involvement in NEMA, was presented during NEMA's 80th Annual Meeting and Leadership Conference in Washington, D.C.

"Over the last 20 years, George has been consistently someone on whom NEMA and the electrical industry can count to serve as a leader in dealing with critical issues," said NEMA Chairman Tim Powers. "He's knowledgeable, reliable, focused and a natural consensus builder."

Dauberger is chairman of Section 5CT (Cable Tray), NEMA Division 5 (Building Equipment Division) and NEMA/NFPA Liaison Committee, and is an active member of other sections and committees. He also served as chairman of Sections 5FB (Conduit Fittings), 5OS (Outlet Boxes), 5PR (Pin and Sleeve) and 5EN (Enclosures).

### »» Encompass Partner Briefs

**Thomas & Betts Offers Online RoHS Compliance Catalog Number Search** In response to the Restriction of Hazardous Substances (RoHS) directive issued by the European Union, Rockwell Automation® Encompass™ Partner Thomas & Betts now offers an RoHS-compliant catalog number search on its Web site. Users can search the online catalog of more than 400,000 Thomas & Betts products by catalog number. [www.rockwellautomation.com/go/p-thomasbetts](http://www.rockwellautomation.com/go/p-thomasbetts)



NEMA recently presented Thomas & Betts Engineering Support Services Director George Dauberger with its Kite & Key Award to recognize his volunteer leadership.

At Thomas & Betts, he is responsible for international product listings, certification and documentation. He holds a Bachelor of Science degree in Mechanical Engineering from Point Park University in Pittsburgh.

**Thomas & Betts**

[www.rockwellautomation.com/go/p-thomasbetts](http://www.rockwellautomation.com/go/p-thomasbetts)

## BELDEN ACQUIRES HIRSCHMANN AUTOMATION

»» Rockwell Automation® Encompass™ Partner Belden, developer of signal transmission solutions, has acquired Hirschmann Automation and Control GmbH (HAC) for a cash price of about \$260 million. HAC is a supplier of industrial Ethernet solutions and industrial connectivity with 2006 revenues of about \$250 million.

John Stroup, president and CEO of Belden, said, "By combining HAC's capabilities with Belden's expertise in signal transmission, we can deliver networking solutions for the most demanding industrial environments and large-scale infrastructure projects worldwide. This acquisition positions Belden uniquely to serve customers who desire to integrate their industrial networks with their enterprise networks."

Headquartered in Neckartenzlingen, Germany, HAC has two production locations in Germany and three joint ventures in China.

**Belden**

[www.rockwellautomation.com/go/p-belden](http://www.rockwellautomation.com/go/p-belden)

**Hirschmann Automation and Control GmbH**

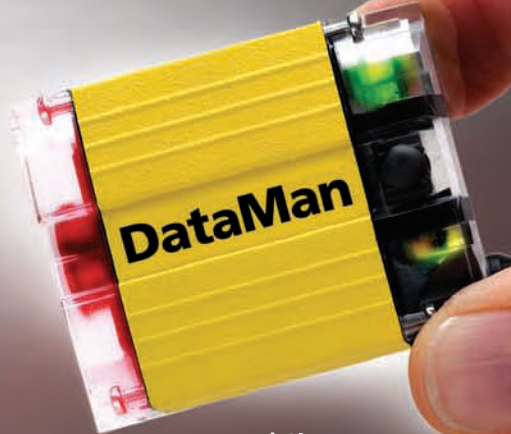
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### »» Encompass Partner Briefs

**Hirschmann Builds New Headquarters** Rockwell Automation® Encompass™ Partner Hirschmann Automation and Control, Inc. recently held a groundbreaking ceremony at the future site of their headquarters for the Americas in Chambersburg, Pa. The 35,000-square-foot building will feature a state-of-the-art training and conference center. The new building will include several environmentally friendly design elements, such as the use of no-/low-VOC products, materials from recycled products and energy-efficient lighting. [www.rockwellautomation.com/go/p-hirschmann](http://www.rockwellautomation.com/go/p-hirschmann)

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## YOU BENEFIT FROM AUTOMATION SERVICES BOOM

Services from automation suppliers help fill the gap created by the skilled labor shortage.

By Theresa Houck, Executive Editor, *The Journal*

➤➤ As you downsize or as your workers retire, years of experience walk out your doors. In addition, today's youth have little interest in studying engineering for a manufacturing career, so finding skilled labor is tough. However, this lack of experienced workers has contributed to one trend that's benefiting you: an automation services boom.

According to the new ARC Advisory Group study, "Automation Supplier Provided Services: Market Size and Forecast Through 2011" ([www.arcweb.com/res/autosvs](http://www.arcweb.com/res/autosvs)), the lack of skilled labor is a primary factor in increasing user demand for automation services — especially maintenance services — for nearly all automation products and applications. That's because with the retirement tidal wave, downsizing and lack of young, skilled employees entering the workforce, many manufacturers can no longer perform automation services in-house.

"End users have fewer and fewer resources from which to draw from internally," explains Larry O'Brien, ARC Advisory Group research director and principal author of the study. "You hear all kinds of stories, like more than half the oil and gas industry engineers will be retiring by 2010. There's a real labor shortage out there. Suppliers are



"Training and education is one of the highest-growth areas in the automation market. Look for automation suppliers who include this with their service offerings."

— Larry O'Brien, ARC Advisory Group

a natural place users turn to for more and more services."

Supplier services are designed to increase efficiencies using solutions that will allow you to manage your operations in real time while keeping your capital expenditures and life-cycle costs to minimum.

For example, the study indicates that long-term control valve support

and implementation issues are a high priority for many users. Manufacturers can ask control valve suppliers to provide valve audit services similar to energy audit services that many equipment suppliers provide.

### Focus on Specialties

Another trend that benefits you is the vertical industry expertise and value-adds automation suppliers are including with their service offerings. This expertise ranges from process-specific expertise to regulatory compliance.

For example, Rockwell Automation® provides teams with expertise and experience in specific vertical industries, from water wastewater to food to automotive and more.

Rockwell Automation also is growing its services business to meet the demands of its process industry customers, according to the ARC study. In addition to its worldwide services organization, the Rockwell Automation Partner Network includes systems integrators and certified Solution Providers offering services from the front-end engineering and design phase through system start-up.

Rockwell Automation offers engineering services where appropriate, and also has focused considerably on after-

sales service, the study notes. The company offers a targeted set of services that address not only control system support and maintenance, but also asset management, overall equipment effectiveness (OEE), and other operational services. Learn about the range of Rockwell Automation maintenance services across the life cycle at [www.rockwellautomation.com/go/journ807](http://www.rockwellautomation.com/go/journ807).

For performance-based services, or services related to adopting new technologies, such as Fieldbus, automation suppliers work with several layers of an organization to make sure the technology implementation will be as smooth and cost-effective as possible.

Various teams from a supplier communicate and coordinate with the executive level, the engineering and operations level, and even the plant's

**A trend that benefits you is the vertical industry expertise automation suppliers are including with their service offerings.**

maintenance personnel. For example, many Fieldbus projects won't even start until the maintenance area gives the thumbs up.

### Important Choice

O'Brien says the scope of services that automation suppliers offer can be extensive. "For end users, the primary challenge is that you have a lot more to choose from when you're looking at suppliers — they have a lot more services, and there's a lot more to sort through. It's a fairly complex process to decide what services to outsource to a supplier."

He recommends that users seek services from suppliers that understand and speak the language of their industry.

Automation suppliers bring extensive expertise and experience to the table, and most offer their services globally. As you face the challenge of increasing efficiency with fewer employees, automation services are an option to help you. □

### ARC Advisory Group

[www.arcweb.com](http://www.arcweb.com)

### Rockwell Automation

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## UPGRADED IN RECORD TIME

Javlyn helps 3M quickly convert its floor-pad production line to the ControlLogix platform.

By Javlyn, Inc.

**>>> The Situation:** 3M's Cumberland, Wis., facility needed to upgrade its legacy PLC-3®-controlled Scotch-Brite™ Floor-Pad production line to an Allen-Bradley® ControlLogix® platform from Rockwell Automation®. Training was no longer readily available for the PLC-3, and it couldn't interface to higher-level communications systems.

**The Challenge:** The PLC-3 spoke a different language: 1,600 ladder rungs and 13,000 instruction codes had to be rewritten for the ControlLogix platform.

**The Solution:** 3M turned to Javlyn to come up with an acceptable strategy to resolve the issue. Javlyn converted all of the PLC-3 code to ControlLogix code and translated all ladder logic and comments.

**The Result:** The new system was tested during a weekend of scheduled downtime. Two weeks later, the PLC-3 was decommissioned and ControlLogix was installed in fewer than than four hours. □

*Rockwell Automation Solution Provider Javlyn, Inc., designs automated processes for food, dairy, beverage, chemical and pharmaceutical industries.*

**Javlyn, Inc.**

[www.rockwellautomation.com/go/p-javlyn](http://www.rockwellautomation.com/go/p-javlyn)

**Solution Provider Program**

[www.rockwellautomation.com/go/sitj](http://www.rockwellautomation.com/go/sitj)



Rockwell Automation Encompass Partner Javlyn converted the PLC-3 code to ControlLogix code for 3M's Cumberland, Wis., facility. ControlLogix, used in units such as the one shown above, brings together the Logix platform's common programming environment, common networks and a common control engine. Tight integration between the programming software, controller and I/O reduces development time and cost at commissioning and during normal operation.

### >>> Consider a Solution Provider for Your Next Project

**Discipline:** You can feel confident choosing a Rockwell Automation Solution Provider (SP). To earn the SP partner status, integrators must possess high corporate standards, financial stability, proven methodologies and competency using Rockwell Automation technologies.

**Credibility:** SPs are well-established organizations offering extensive experience in advanced automation solutions. They have been trusted advisers for their customers from initial design and consultation, system development, through the commissioning of comprehensive Rockwell Automation solutions.

**Expertise:** Whether your need is in design, project management, implementation or manufacturing systems maintenance, SPs possess the industry knowledge, domain expertise, resources and skills to deliver world-class solutions.

Find a Solution Provider at [www.rockwellautomation.com/go/sitj](http://www.rockwellautomation.com/go/sitj).



By Kenneth F. Deken, Vice President and General Manager, Rockwell Automation Logix-NetLinX Business, and Michael P. Burrows, Rockwell Automation Americas Regional Leader, Integrated Condition Monitoring

# Rev Up Your Main

Shift your production into high gear us

>> Ask any plant operations manager for the two words he or she dreads seeing the most on a status report, and more than likely the answer will be “equipment failure.” With the pressures of today’s competitive global marketplace, you can no longer afford to rely on reactive maintenance. Even with limited resources, you can develop a more efficient — and cost effective — maintenance strategy.

The most effective maintenance program includes a combination of three key approaches: predictive (PdM), preventive (PM) and reactive. The combination varies depending on your production and business goals. Predictive maintenance is the most reliable approach for rotating equipment, yet it often is undersized, accounting for

just 15 percent of maintenance programs on average versus a desired level of more than 40 percent<sup>1</sup>.

The key to creating a successful PdM program is taking action once an equipment issue has been identified to avoid the potential failure. The most common PdM is Condition-based Maintenance (CbM), a proven strategy that results in one of the fastest paybacks of any asset-management solution. **Figure 1** shows ranked asset management solutions used by manufacturers.

Maintenance personnel use many methods for detecting potential equipment failure, such as visual identification, control system indicators and auditory detection. These default methods of machinery monitoring all have one thing in common: They often

detect a problem when it is too late to prevent it.

CbM uses early warning data such as vibration, collected manually or via automation systems, allowing you to assess your equipment’s current condition. **Figure 2** illustrates the benefits of an early warning. As simple as it may sound, vibration is one of the best indicators of a potential equipment failure, not only because it detects potential failures early on, but because it indicates a wide range of issues.

## An Integrated Solution

Changes in technology and methodology have made the ability to predict manufacturing equipment failures simpler and more cost-effective. As with the three key maintenance approaches mentioned previously, a



# Maintenance Strategy

Using predictive maintenance to help meet business goals.

combination of CbM programs — Walk-Around, Online Surveillance, and Real-Time Protection — can be configured to best suit your company's maintenance strategy.

## Walk Around

A Walk-around CbM program can be a cost-effective way to introduce a PdM strategy. Machines can be monitored on a periodic basis where there are no safety concerns, and the typical time-to-failure takes months such as with normal bearing wear. Maintenance personnel regularly collect data, analyze it and then convert it into maintenance recommendations. This approach also is common for in-depth investigation of single-point issues identified by online systems.

## Online Surveillance

Online Surveillance is suitable when data collection must be automated due to safety concerns, limited machine access, or insufficient resources for data collection, or when typical time-to-failure is weeks, days or hours.

Besides being repeatable, these systems gather data that can be integrated easily with other key production process information from the control system. Common issues such as contamination, imbalance and misalignment are identified more quickly than with a Walk-Around program. In addition, automation tools such as basic alarms and analysis tools that are built into today's software minimize or eliminate the need for expert vibration analysis on some applications.

## Real-Time Protection

Real-time Protection provides continuous machinery monitoring but will not prevent equipment failure or a production shutdown. This method should be employed for instantaneous failures to avoid collateral damage, protection of high-speed machinery or applications in which a failure could compromise safety. It also will support critical applications in any industry where an unpredictable failure could result in significant production loss.

To have a successful predictive maintenance program, you need to answer two questions:

1. Can we do this in-house?
2. What role will automation play?

## Can We Do This In-House?

The benefits of a predictive maintenance program can be realized whether

the program is insourced or outsourced. Either approach has proved to be suc-

### >> Which CbM Program is Right for Your Company?

When choosing which method, or combination of methods, would best suit your plant floor operations, start by determining how long a mechanical problem can be tracked before it causes a serious issue.

- >> Choose Walk Around if a problem can be tracked for months without incident.
- >> Choose Online Surveillance if a problem only can be tracked for minutes or days before a failure.
- >> Choose Real-Time Protection if a failure cannot be tracked at all and could cause safety issues or collateral damage.

### >> Predictive Maintenance Helps You Outside the Plant

You benefit from predictive maintenance (PdM) every day — and not just on your production lines. For example, your automobile has varying levels of required maintenance. Some problems, such as a flat tire, would fall into the reactive maintenance category, but current technologies allow you to employ PdM strategies on your automobile as well. Key indicators, such as oil life monitors, check engine dashboard lights or tire air pressure sensors, alert you to a problem before a breakdown or traffic accident occurs. These kinds of PdM measures can save money and, more importantly, lives. The same is true with your plant production lines.

cessful if it matches the maintenance culture and long-term objectives.

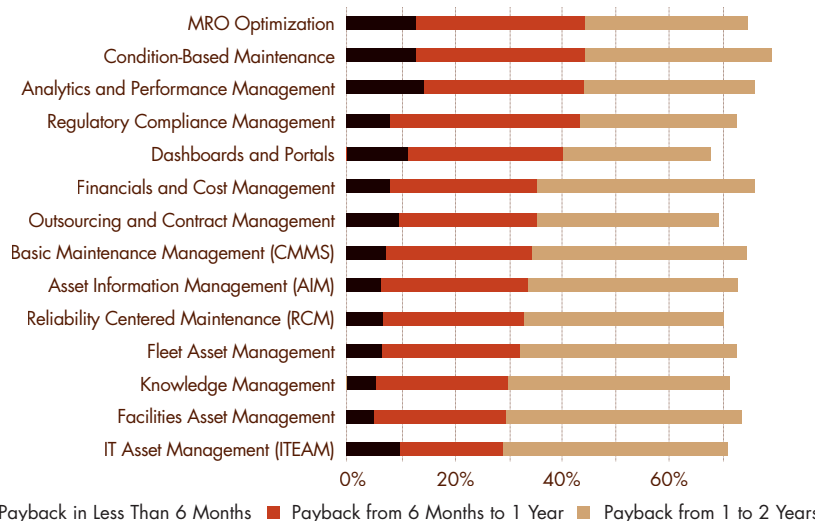
Insourced programs have proved to be highly effective and the lowest-cost, long-term solution. This approach focuses on developing knowledge on production equipment. Insourcing can improve the effectiveness of any maintenance activity.

However, some insourced programs stall because of the cost of maintaining data collectors, software and skilled personnel. To avoid this problem, choose

a partner that offers a collaborative approach that includes ongoing access and support from a senior remote analyst. This partner should also provide portable data collectors, software and training bundled into one support agreement with a realistic timeline to transition to in-house management.

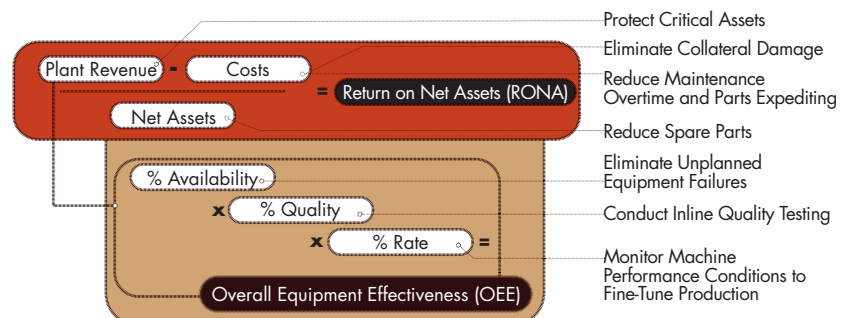
Outsourcing a PdM program has many benefits, such as known costs and more time for other initiatives, but it is important to develop and manage a good partnership with the

### >> Rapid Payback Asset Management Solutions



**Figure 1.** Manufacturers ranked their top asset management solutions with the greatest return on investment. Source: ARC Insight 2006-38ECMP "Rapid Payback Asset Management Solutions" by Houghton Leroy.

### >> The Value of an Early Warning



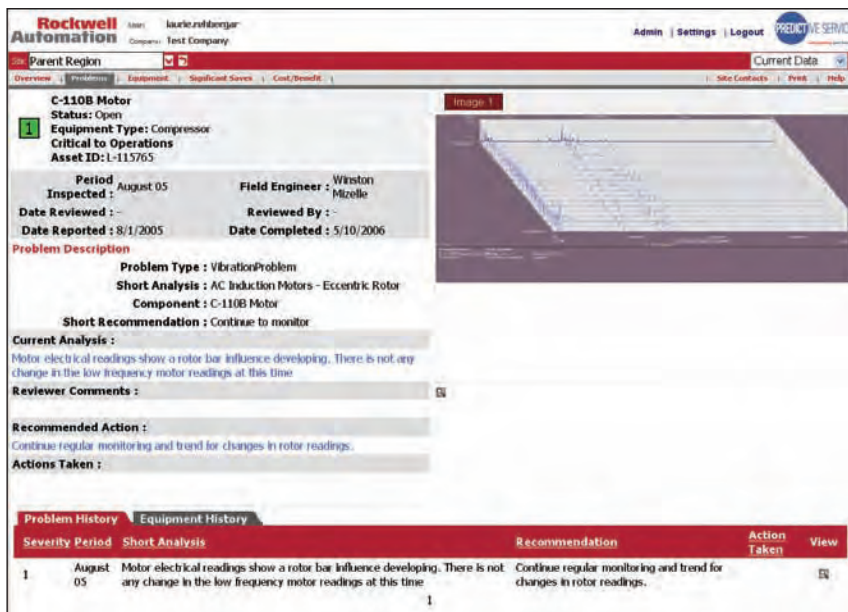
**Figure 2.** Condition-based maintenance (CbM) uses early warning data, such as vibration, to help you identify a potential equipment failure.

provider. Make sure the provider agreement includes scope and a documented return on investment. The Web portal shown in **Figure 3** is a good example of an outsourced program that is focused on documented returns and incorporates multiple capabilities for improved effectiveness and accountability.

### What Role Will Automation Play?

Regardless of whether a PdM program is insourced or outsourced, automation will increase its overall continuity and effectiveness (see **Figure 4**). With industry trends leaning more and more toward integration, you can create efficient and cost-effective PdM programs with real staying power. In addition, with the rise of safety guarding, permanently installed sensors and monitors are becoming a common requirement.

**Figure 3.** This Web tool is an example of an outsourced program focused on documented returns and incorporates multiple capabilities for improved effectiveness and accountability.



Today's automated systems leverage existing control architecture through automated data collection, communicating common issues and alerting the need for detailed analysis. By utilizing the networks, controllers and operator interface devices already in place, you can reduce system costs associated with stand-alone or dedicated technologies.

The Rockwell Automation Integrated Architecture™ naturally lends itself to this kind of strategy. Using common, off-the-shelf technologies to

**Figure 4.** Regardless of whether a predictive maintenance program is insourced or outsourced, automation will increase its overall continuity and effectiveness.

develop automated functions helps to lower entry costs into PdM.

### Shift Your Production Into High Gear

Equipment failures have a significant impact on production schedules, maintenance costs, product quality, plant safety and other financial measurements.

With continued pressures to lower production costs, reduce downtime and increase productivity with fewer resources, you need a maintenance strategy that helps to achieve your company's production and business goals. Improving your PdM approach as part of your overall maintenance strategy will help you reach those goals.

When PdM is properly applied, unscheduled downtime can become a thing of the past, and increased productivity and lower costs will be enjoyed now and in the future. □

<sup>1</sup>Source: Rockwell Automation survey, 2003.

**Condition Monitoring**  
[www.rockwellautomation.com/go/tj08pdm](http://www.rockwellautomation.com/go/tj08pdm)

## PARTNER PROFILE: COOPER BUSSMANN

## NEW COOPER INVISION™ SYSTEM REDUCES DOWNTIME FOR INCREASED PRODUCTIVITY

The cost of unscheduled downtime is a continuing problem in many industries. A comprehensive study of manufacturing facilities in the automotive, petroleum, chemical, steel and aluminum industries found that an open circuit event resulted in an average of 41 minutes of downtime — including 11 minutes, on average, to notify maintenance and 24 minutes, on average, to locate and troubleshoot.

With downtime costs ranging from \$300,000 to millions of dollars per site per hour, monitoring critical circuits to eliminate unnecessary downtime can add up to substantial savings.

Fuses and circuit breakers protect machinery and employees. Now, with the new wireless Cooper InVision™ Downtime Reduction System, these protective devices can better protect the bottom line. When a circuit opens, the maintenance staff is automatically notified by phone, fax or e-mail of:

- >>The circuit's exact location.
- >>The correct replacement fuse to bring.

>>The appropriate level of personal protective equipment (PPE).

The System has been field-tested in harsh environments and offers 99.999% event transmission reliability.

The System includes the following components:

- >>Intelligent Fuse Monitors (IFMs) and Intelligent Circuit Monitors (ICMs) transmit any change in status to the System Routers.
- >>Wireless Mesh Routers provide reliable, redundant, self-healing connectivity.
- >>The Gateway encrypts data and sends it to the secure Command Center servers.
- >>The Command Center, an Internet-based application, displays the status of monitored circuits, and initiates the phone, fax or e-mail alert.

The Cooper InVision Downtime Reduction System helps to identify recurring problems — problems plant management might not even know exist. The System stores open-circuit alert data from which summary reports and



### Do Your Circuits Call You When They Open?

- >>Location: Final assembly department electrical room 5, MCC-1, bucket 4A.
- >>Fuse part number: LPS-RK-30SP.
- >>Arc-flash hazard alert: Wear appropriate PPE suitable for hazard risk category 1, minimum of 4 calories per square centimeter.

**With 99.999% Event Transmission Reliability**

trend analysis can be made to identify problem circuits that require remedial action. The Cooper InVision Command Center has the ability to assess downtime performance through more than 20 customized reports.

Visit the Cooper InVision online calculator at [www.cooperbussmann.com/invision](http://www.cooperbussmann.com/invision) to see how minimizing each downtime occurrence — even by a few minutes — can add up to substantial savings.

### Cooper Bussmann

P.O. Box 14460, St. Louis, MO 63178-4460 USA

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# Pepsi Keeps Bottling Lines Moving

A strategic approach to maintenance helps Detroit bottling plant cut downtime, reduce repair costs and streamline inventory.

➤ *Note: This is the first article in a two-part series about Pepsi Co.'s success using Rockwell Automation technology and services. This article describes how a strategic approach to maintenance helped Pepsi Bottling Group's Detroit facility increase productivity and cut costs. The second article in the series will appear in the October 2007 issue of The Journal and will discuss how Pepsi America's Des Moines, Iowa, facility improved efficiency and productivity after implementing continuous improvement initiatives.*

The Pepsi Bottling Group's Detroit facility needed to reduce downtime and its spare parts inventory. This would make repairs and managing spare parts inventory much easier. Pepsi Bottling Group contracted with Rockwell Automation® to provide a plan for a more strategic maintenance approach that would eliminate overtime and lost production. As a result, the Detroit plant improved equipment reliability and cut its spare parts inventory by more than half.

While controllers and software are the brains behind any production operation, sensors play a critical role as the eyes and ears. Pepsi Bottling Group's Detroit plant uses a variety of sensors to monitor bottles as they travel through the sequence of steps and to manage the flow to individual stations. Line sensors match the speed of the conveyor to the precise spacing required to accomplish each production step.

Like many high-volume manufacturing plants, Pepsi's primary focus is on quality and productivity, with less attention given to issues such as parts inventory and technology migration. As a result, the company's inventory of sensors swelled over the years to include more than 120 varieties. Many of these included multiple styles of the same product stocked under different brand names. Similarly, its drives inventory had grown to more than 50 part numbers.

The variety of sensors made it progressively more complex and time-consuming to replace a faulty device. The increasingly lengthy and more frequent

downtime was affecting the company's ability to meet its productivity goals.

"We had a lot of specialized sensors that we didn't really need, which increased our inventory costs and made it a nightmare for our technicians to make repairs — if we even had the right parts in stock," says Tony Yanora, maintenance manager, Pepsi Bottling Group.

### Partnership Pays Off

First, Rockwell Automation conducted an Installed Base Evaluation™ — a plant-wide inventory assessment to determine the exact number of sensors and drives the plant had in stock.

Rockwell Automation then identified which products were needed and which ones could be eliminated. It recommended that Pepsi streamline its operation by standardizing its entire sensors inventory. The local distributor, McNaughton-McKay Electric Co. (Mc & Mc), helped design a migration plan to help ease the cost of this inventory conversion.



Although all the drives employed at the plant were Allen-Bradley brand, many were older models representing a multitude of drive families. Pepsi converted all of its drives to the Allen-Bradley® PowerFlex® family of AC drives. A detailed cross-reference chart developed by Rockwell Automation now provides technicians with a quick and easy way to identify failed and replacement parts, as well as installation instructions.

Pepsi also set up a Rockwell Automation Services Agreement that included parts management. Pepsi pays a fixed monthly cost for its spare parts, which are owned and managed by Rockwell Automation but stocked on site. The agreement allows Pepsi to reduce its up-front expenses, have immediate access

to spares, reduce carrying costs, and update its control technology cost-effectively. The agreement also includes an in-service warranty, so the parts don't go out of warranty until they are used for the warranty period.

The agreement also included Tech-Connect<sup>SM</sup> Support. This remote support service provides the plant with 24/7 access to Rockwell Automation technical specialists. Pepsi technicians can call for immediate troubleshooting assistance. Rockwell Automation technical specialists also can perform remote system diagnostics through an Allen-Bradley modem installed at the Pepsi facility.

As part of the Rockwell Automation Services Agreement, and to help the plant effectively migrate its operator interface

The Pepsi Bottling Group's Detroit plant reduced its number of sensors from 180 to 46, a decrease of 66 percent, by standardizing its sensors inventory to Allen-Bradley products. This reduced downtime and inventory costs.

systems, Pepsi used Operator Interface Conversion Services from Rockwell Automation. The service included a review of the plant's goals, site requirements and existing operator interface inventory, followed by a detailed plan to convert the existing hardware and software code. This helped Pepsi minimize risk and reduce long-term costs.

### Better Reliability, Bottom Line

Pepsi Bottling Group has improved inventory and parts-management capabilities, thus reducing downtime and inventory costs. Also, standardizing its sensor products eased training requirements and minimized the technology learning curve. These benefits have enhanced productivity by 8 percent and reduced the overtime required to fill orders.

In addition, the plant reduced its number of sensors from 180 to 46, a decrease of 66 percent. Likewise, it re-

### >> Pepsi Bottling Group At a Glance

Pepsi Bottling Group is the world's largest manufacturer, seller and distributor of Pepsi-Cola beverages. With annual sales of nearly \$11 billion, the company's fastest growing segment is noncarbonated beverages, including the No. 1 brand of bottled water in the United States, Aquafina, as well as Tropicana juice drinks and Lipton Iced Tea. As part of a 24/7 production operation, the company's Detroit plant ships about 27 million bottles per year.



duced the number of drive styles from several hundred to 14.

“Most importantly, unplanned downtime no longer keeps us awake at night,” Yanora says. “With the focus on strategic maintenance Rockwell Automation brought to us, this plant has become one of the most efficient, productive and advanced in the Pepsi Bottling Group.”

Additionally, Pepsi’s Rockwell Automation Services Agreement brings in a Rockwell Automation asset-management expert to work on-site at the plant one day a month to help manage inventory issues, conduct on-the-job training programs, and evaluate monthly repair reports to determine trends, analyze costs and identify levels of spare parts usage.

The improved inventory management helped eliminate emergency parts delivery issues. The Services Agreement has allowed the plant to upgrade its drives, so drive reliability has improved greatly, from one to two drive failures per month to just one in the last year. In addition, the company can reallocate the money it spent stocking unnecessary inventory to other business priorities.

“We’re able to reduce our inventory costs because we’re no longer buying sensors and drives until we need them,” Yanora says. “This has allowed us to hold the line on maintenance costs while still updating our equipment with the latest technology.”

Equally important, the company now

has a list of the sensors and drives it stocks and can provide this list of approved products to its OEMs when specifying new equipment. This has helped the plant standardize its equipment during several new installations in the last year.

The combination of increased productivity and reduced inventory costs allows the Pepsi Bottling Group to focus on higher priorities, such as bringing innovative products to market and meeting profitability goals. □

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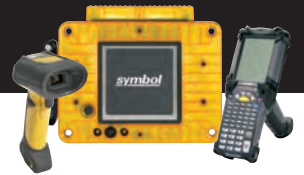


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# Return on Investment Forecasting Tool helps to justify the cost of employee training programs.

By Georgene Berman, Training Product Manager, Rockwell Automation

➤ Budget time. It's everyone's "favorite" part of the year, when financial wish lists are written, and managers compete to secure their departments a slot in the "business necessity" column.

Although many company executives consider employees to be their most valuable assets, training budgets are among the first line items to be cut. Gaining buy-in to spend money on employee training programs can be challenging.

Yet, according to a four-year study by the American Society of Training and Development (ASTD), companies that invest \$1,500 per employee in training programs experience an average increase of 24 percent in their gross profit margins.

"Sounds impressive," your boss might say when you quote similar statistics during your budget review. "But can you prove these training programs will boost *our* profit margins?" By using the Rockwell Automation® Training Services Return on Investment (ROI) Forecasting Tool, you can confidently answer, "Yes, I can."

The ROI Forecasting Tool was created so companies can calculate the money they'll save on various manufacturing costs in the long run by investing in training now. Available on the Rockwell Automation Web site at [www.rockwellautomation.com/go/tjroi](http://www.rockwellautomation.com/go/tjroi), the tool uses common metrics related to service, quality and production. A Metrics Selection Guide also is provided to help you determine which metrics should be included in your ROI calculation.

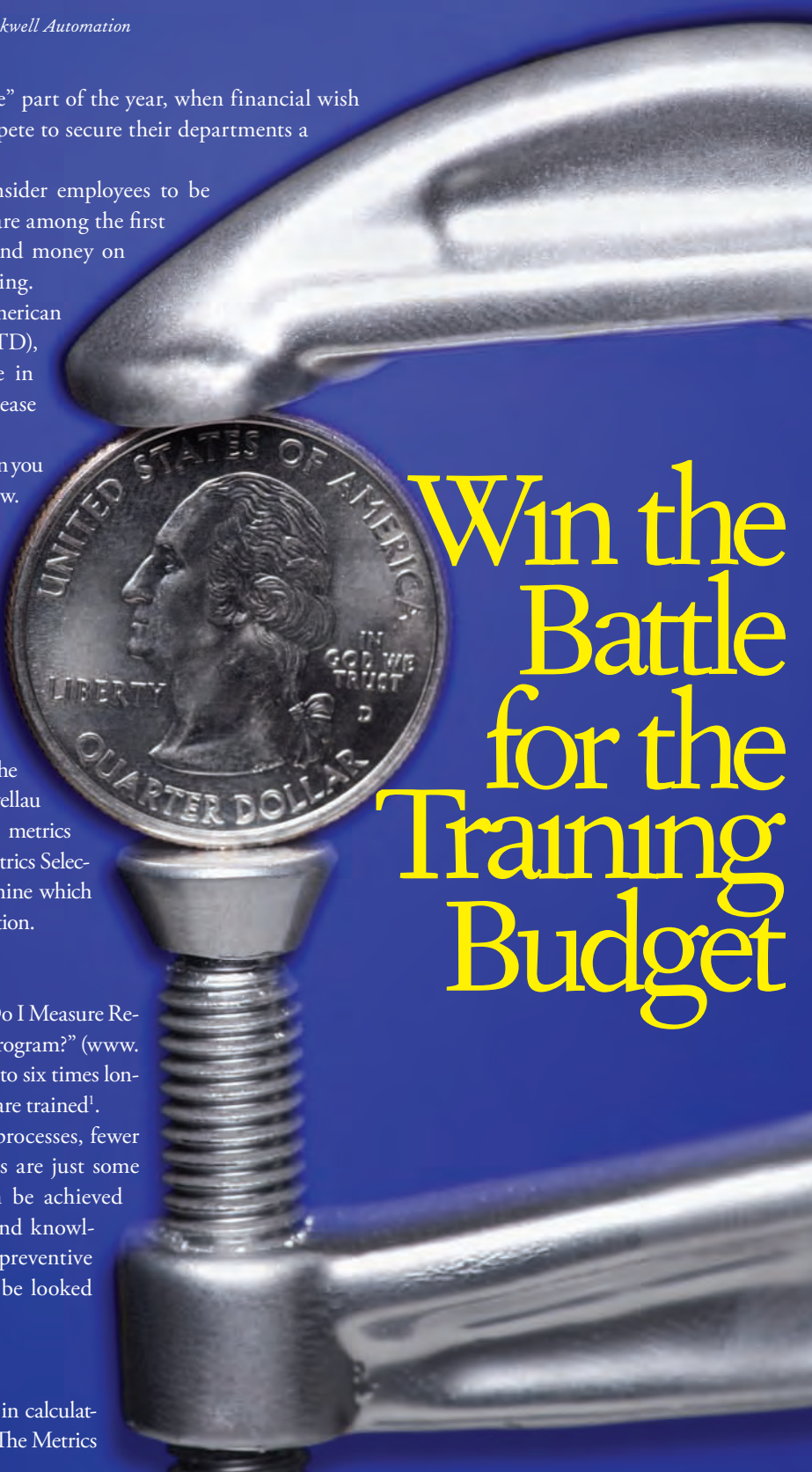
## The Economic Value of Training

Marcia L. Conner writes in her article, "How Do I Measure Return On Investment (ROI) For My Learning Program?" ([www.learnativity.com](http://www.learnativity.com)), that untrained users take up to six times longer to perform the same tasks than those who are trained<sup>1</sup>.

Reduced duplication of effort, improved processes, fewer operator errors and lower maintenance costs are just some of the productivity improvements that can be achieved by regularly investing in employees' skills and knowledge through training programs. Like other preventive maintenance expenditures, training should be looked upon as an investment, not an expense.

## Getting Started

1. **Identify Meaningful Metrics.** The first step in calculating your training ROI is to select your metrics. The Metrics



# Win the Battle for the Training Budget

**ROCKWELL AUTOMATION TRAINING SERVICES**  
**RETURN ON INVESTMENT (ROI) FORECASTING TOOL**

**Guiding Principles:**  
Enter data for only one job category.  
Consider cost metrics that are impacted by that job category only.

*Enter known data, if applicable, in yellow shaded areas.*

**Cost Metrics Impacted by Job Category**

**Calculate Production Costs:**

	Cost in Dollars
Estimated cost of downtime (per minute):	\$0.00
Estimated downtime hours per month:	0.0
<b>Estimated downtime cost per year:</b>	<b>\$0.00</b>
Estimated vendor support cost per year:	\$0.00
Estimated overtime cost per year:	\$0.00
<b>Estimated cost of lost production per year:</b>	<b>\$0.00</b>

**Calculate Quality Costs:**

	Cost in Dollars
Estimated cost from waste per year:	\$0.00
Estimated rework cost per year:	\$0.00
Estimated programming error cost per year:	\$0.00
<b>Estimated cost of poor quality per year:</b>	<b>\$0.00</b>

**Calculate Service Costs:**

	Cost in Dollars
Estimated cost of monthly maintenance:	\$0.00
Estimated cost associated with repair time:	\$0.00
Estimated cost associated with backlog:	\$0.00
<b>Estimated service cost per year:</b>	<b>\$0.00</b>
Other cost (if any):	\$0.00
Other cost (if any):	\$0.00
<b>Estimated other cost per year:</b>	<b>\$0.00</b>

ESTIMATED TOTAL COST: \$0.00 | TOTAL SAVINGS: \$0.00 | Estimate % Improvement from Training: 0%

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The Rockwell Automation Return on Investment (ROI) Forecasting Tool supplies three calculations for ROI, ROI percentage and payback period.

	Service	Quality	Production
Cost	<ul style="list-style-type: none"> <li>&gt;&gt; Monthly Maintenance Cost</li> <li>&gt;&gt; Services Cost as Percent of Sales</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Rework Cost</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Downtime Cost</li> <li>&gt;&gt; Vendor Support Cost</li> <li>&gt;&gt; Overtime Cost</li> </ul>
Time	<ul style="list-style-type: none"> <li>&gt;&gt; Repair Time Cost</li> <li>&gt;&gt; Mean Time to Respond</li> <li>&gt;&gt; Service Time per Call</li> <li>&gt;&gt; On-time Shipments</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Order Response Time</li> <li>&gt;&gt; Time to Market</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Equipment Downtime</li> <li>&gt;&gt; Setup Time</li> <li>&gt;&gt; Cycle Time</li> <li>&gt;&gt; Output per Hour</li> </ul>
Quantity	<ul style="list-style-type: none"> <li>&gt;&gt; Backlog Cost</li> <li>&gt;&gt; Number Served</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Inspection Yields</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Units Produced</li> <li>&gt;&gt; Items Assembled</li> <li>&gt;&gt; Tons Manufactured</li> </ul>
Errors	<ul style="list-style-type: none"> <li>&gt;&gt; First-Time Fix Rate</li> <li>&gt;&gt; Calls Handled</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Waste Percentage</li> <li>&gt;&gt; Programming Errors</li> <li>&gt;&gt; Scrap Percentage</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Product Defects</li> <li>&gt;&gt; Number of Accidents</li> </ul>
Reaction	<ul style="list-style-type: none"> <li>&gt;&gt; Customer Satisfaction</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Competitive Benchmarking</li> </ul>	<ul style="list-style-type: none"> <li>&gt;&gt; Employee Complaints</li> </ul>

The first step in calculating your employee training return on investment ROI is to select meaningful metrics.

Selection Guide identifies various metrics that can be affected by a knowledgeable and skilled workforce. Use this guide to select the measurement category that relates to your business and training goals. Be sure your business goals, ROI metrics and training plan are all tightly linked together. Otherwise, you may not get the desired results or the financial return on your training investment.

**2. Specify Current Costs.** Once you have selected the best metrics, specify the current cost associated with each one, e.g., downtime costs, annual vendor support costs, annual overtime expenses, etc. Knowing current costs allows you to make a cost-based comparison before and after your workforce receives training.

**3. Predict Improvement.** Next, estimate the percentage of improvement as a result of the training program, based on your current situation and your specific metrics. Take into account factors such as current job performance; variation in skill and knowledge levels; number of people trained; and quality and relevancy of the training given. Be realistic about your estimate. Training is only one factor that has an influence on job performance.

**4. Determine Training Costs.** Generate a list of all the training expenses, including tuition, course materials, instruction fees, equipment costs, room rental and travel. Also include the salaries and benefits incurred while your workforce is learning new skills.

**5. Review Training ROI Results.** Finally, you will automatically receive three different calculations: ROI, ROI percentage and payback period. The ROI calculation represents the dollars returned on each dollar spent within the first year. ROI percentage is the return in net savings, after costs are recovered, within the first year.

For example, an ROI of 150 percent indicates that the training cost has been fully recovered, plus you have saved 150 percent of, or 1.5 times, the training

costs in performance improvements.

Payback period is the number of months it will take a company to recover the training cost. In some cases, you can recoup those costs in less than one year.

## Be Prepared to Win

Understanding how to forecast and measure training ROI is essential. Knowing the potential financial benefits before submitting your training budget helps to state your case in a language that management understands: bottom line dollars.

Knowing your potential ROI is valuable, but always back up your ROI calculations with relevant statistics. For example, studies have shown that just a 2 percent increase in productivity could net a 100 percent return on investment in outsourced, instructor-

led training<sup>1</sup>. Few company executives would refuse to fund training programs with that kind of return.

Remember, decision-makers need the facts. An ROI Forecasting Tool will arm you for the financial fight. Let the battle begin.

<sup>1</sup>Training ROI. Avatech Solutions, [www.learnativity.com](http://www.learnativity.com), "Cost of Not Training." □

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Training Services

[www.rockwellautomation.com/go/tjroi](http://www.rockwellautomation.com/go/tjroi)

## >> Gather Ammunition for Your Training Budget Proposal

Determine the value of a training program in five easy steps:

1. Identify meaningful metrics in the appropriate measurement category (production, quality or service costs).
2. Plug your metric cost data into the ROI Calculator (downloadable form available at [www.rockwellautomation.com/go/tjroi](http://www.rockwellautomation.com/go/tjroi)).
3. Estimate the expected percentage of improvement in employee performance.
4. Add in the total training costs (including travel, employee salaries while off-site, etc.).
5. Review your training ROI results.



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# Keys to a Successful CMMS Implementation

The transition to using maintenance software as part of your asset management program can be a smooth one.

By John Dorner, OPS Systems, Inc.

➤➤ Einstein searched for the Grand Unified Field Theory. It's a great concept, but he never found it. Asset management may be thought of as a Unified Theory, bringing all the factors that affect equipment and maintenance systems management into one integrated system. For example, in a municipal utility, typical factors include equipment records, maintenance records, personnel records, accounting records, geographical records and more.

The first requirement for success in unifying your equipment and maintenance systems is to have enough money. This could mean millions of dollars.

Second, you must have a few people who can understand the total scope of work — real Einsteins.

Unfortunately, many of these projects aren't successful. Just in the subcategory of Computerized Maintenance Management System (CMMS), we have heard it said that 50 percent of CMMS projects fail.

A more successful approach, especially if your company doesn't meet requirements one and two, is to implement pieces of the grand solution that a person can understand. Find pieces of the puzzle that have been proven to work. Get "best of breed" software — Best CMMS, Best Accounting, Best GIS, etc. — and implement them. Then build bridges (interfaces) between these packages.

## Keys to Success

First, find your system champion. This is someone who has the skills and desire to make the system work. The system champion must be both computer literate and have experience working in maintenance.

If you can't find such a person, stop. Wait until you find one. Then make sure that person has the time outside of his or her normal duties to focus on the project. When starting a CMMS implementation, the time commitment will be almost full time. Without that commitment, you never get to the starting line.

A CMMS need not be overly complicated. It should show your organization what needs to be done and keep a record of what is done. Then, you need to send summary information to other functions. For example, Purchasing needs to know what needs to be ordered and Finance will need cost information.

To begin, a database must be populated with equipment information, the preventive maintenance tasks to be performed and their frequency. If the package you've chosen doesn't use a database, stop, go back to the beginning and pick one that does.

If you're moving from a paper system, or worse, no system (fix it when it breaks), you'll need to go back to the Operation & Maintenance (O&M) manuals for your equipment. Check with your equipment manufacturers to see if they have an electronic format

of the O&M manual to save you a lot of typing.

Any CMMS program will have a place to put everything you ever wanted to know about an item. Do not attempt to get everything in on the first round. Remember, your goal is to get to the starting line before you get fired. Get the essential information in. You can go back later to put nameplate data in, or hire temporary help. You need to load an accurate and complete description of the work to be done, tools required and materials. Did you ever notice that half of the people walking around an operation are going to get the tools they need?

If your CMMS vendor offers on-site implementation and training services, don't skip it! Take advantage of this invaluable knowledge, especially if you don't have internal information technology (IT) support.

Look for these factors from vendor-provided services:

1. A planning session with your system champion and key management personnel.

You'll determine the resources available for loading the setup data.

### >> What is CMMS?

A Computerized Maintenance Management System (CMMS) is a computer system that schedules, tracks and monitors maintenance activities. It provides cost, component item, tooling, personnel, and other reporting data and history. CMMS systems often can be interfaced with production scheduling and cost systems, and may be used to follow preventive maintenance policies.

### >> What is Asset Management?

Asset management systems have evolved from maintenance management systems. Maintenance management systems use work orders for preventive and predictive maintenance, equipment recording and tracking, replacement parts inventory and maintenance labor scheduling. Asset management optimizes asset use and manages all maintenance efforts involved in making assets as reliable, accurate and efficient as possible. A further crucial element in enterprise asset management is integration with financial, human resources and purchasing functions, as well as production and enterprise resource planning systems.



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Set the timeline goals, including a “go live” date.

2. Administrative training for the System Champion.

This should be done as soon as possible so he or she has a complete understanding of the program’s functionality.

some bridges. First, tie into the Rockwell Software RSVIEW™ human-machine interface (HMI) or the RSBizWare™ Historian™ from Rockwell Automation. This interface is a well-known application and should be easy to implement.

Theory into manageable pieces a person can understand, identify the system champion and focus on getting started. □

*John Dorner is president and CEO of Rockwell Automation Encompass™ Partner OPS Systems Inc. Based in Rio*

## A CMMS need not be overly complicated.

This session should cover system security (who has rights to read/write/edit data), system installation, administration of the application, troubleshooting, etc.

3. General training. This can be done just before you “go live,” with the trainer available to monitor the actual transactions. It’s a good idea to budget a follow-up visit after several months of operation because it’s easy to drift off course in the early stages, and this process is a voyage.

### Build Interfaces

Once your CMMS process is running smoothly, you’re ready to build

Many maintenance tasks, such as run times, starts, etc., are tied to process data. When you bring this data into the CMMS automatically, it’s more reliable and efficient than entering it by hand.

You’re now closer to a Unified Theory and can place the Einstein plaque on your desk — you have successfully implemented a CMMS with bridges (interfaces) to other systems, giving you accurate and secure data.

Success easily can be achieved when using the KISS principle: Keep It Simple, Stupid. Break your grand goals of creating a Unified

*Rancho, N.M., OPS provides data-management software to for the water wastewater industry: OPS SQL™ for Operations, Reporting, and Analysis; Aspen LIMS™ for Laboratory Management; and JOB Cal® for CMMS.*

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# Get a Taste of Chicago

By Lisa Towers,  
Managing Editor, The Journal

The Automation Fair Event 2007 is the perfect mix of business and pleasure, with more than 100 exhibitors from which to sample.



If you're searching for ways to optimize your manufacturing operation, the Automation Fair® 2007 event from Rockwell Automation® is the place to try out new ideas and technology to solve the challenges your company faces. And there's no better place to find those answers than in Chicago, known as The City that Works.

This year's event, held Nov. 14-15 at the new McCormick Place West, focuses on advanced automation products, integrated control and information architecture, services and solutions. It offers industrial forums and labs to provide you with a top-notch educational experience. This year's program includes 54 technical sessions that cover 14 categories, 20 hands-on labs and more than 100 exhibitors. By attending, you can learn how to:

*Continued on p. 36*

Photo courtesy of the Chicago Convention and Tourism Bureau.

# Be There

<b>WHO:</b>	Rockwell Automation® and its Partners
<b>WHAT:</b>	The Automation Fair 2007 Event
<b>WHERE:</b>	McCormick Place West
<b>WHEN:</b>	Nov. 14-15, 2007
<b>HOURS:</b>	Wednesday, Nov. 14 from 8 a.m. to 5:30 p.m.; Thursday, Nov. 15 from 8 a.m. to 4 p.m.
<b>REGISTER:</b>	Online at <a href="http://www.automationfair.com">www.automationfair.com</a> or contact your local Rockwell Automation representative.
<b>COST:</b>	Free for all attendees.
<b>LEARN HOW TO:</b>	Improve time to market, increase profitability, develop asset-management and optimization strategies, and manage manufacturing business risk.

## >> Famous Chicagoans

Chicago is home to many famous Americans, and here are some of the more recognizable Midwesterners.

- >> **Hillary Rodham Clinton** is the 1st First Lady elected to the U.S. Senate.
- >> **Walt Disney**, creator of the cartoon character Mickey Mouse, was born in Chicago on Dec. 5, 1901.
- >> **Harrison Ford**, popular actor and also *People* magazine's 1998 "Sexiest Man Alive," is a native Chicagoan.
- >> **Jane Addams** founded Hull House to help immigrants and was the first American woman to receive the Nobel Peace Prize, which she won in 1931.

### Other famous Chicagoans include:

- >> **John Cusack**, actor
  - >> **John Mahoney**, actor
  - >> **Dorothy Hamill**, Olympic figure skater
  - >> **Quincy Jones**, musician
  - >> **Pat Sajak**, game-show host
  - >> **Daniel Burnham**, architect
  - >> **Benny Goodman**, musician
- Courtesy of the Chicago Convention and Tourism Bureau.*

The Automation Fair® 2007 event offers you the opportunity to meet with Rockwell Automation Encompass™ Partners and Solution Providers, which make up the more than 100 exhibitors at the event. The following is a preview of some of the partners and products you can find at the show. For more information about Encompass Partners and Solution Providers, visit [www.rockwellautomation.com/partners](http://www.rockwellautomation.com/partners). *Booth numbers are current as of August 2007, but are subject to change.*

AFAST ROBOTICS, INC. will display robotics being controlled by Logix. Multiple configurations are being presented using our standard SCARA line of robotics. Other features, such as conveyor tracking and camera integration with robotics, are being presented. See our latest in development of robotics for high-speed picking and placing applications. **Booth #636**

AMPHENOL SINE SYSTEMS is a designer and manufacturer of interconnection cables and assemblies, specializing in automation, heavy-duty machinery, medical equipment, telecommunications and defense. They take ideas and make them a reality, and can provide off-the-shelf solutions or develop new solutions to meet your requirements. Stop by their booth for more information. **Booth #668**

Charter Rockwell Automation Solution Provider BACHELOR CONTROLS (BCI) is a leading provider of control and systems integration solutions, with extensive experience in the food and beverage, pet food, pharmaceutical, plastics, specialty chemicals, and feed and grain industries. The BCI exhibit will feature high-end batching systems, cooking extrusion automation and MES solutions. **Booth #506**

BELDEN will exhibit an expanded line of cabling and connectivity solutions for mission-critical applications, including DataTuff cables and connectivity for industrial Ethernet, new DeviceNet,

ControlNet and VFD cables. Also, see Blue Hose for PLC systems, instrumentation and control, and flexible automation cables. **Booth #507**

BLOCK USA, a manufacturer of advanced transformers, EMI and VFD filters, will present second-generation harmonic filter modules, along with its line of sine wave filters. Today's world of ever-increasing problems with harmonic distortion requires the use of the HFR line of filters to meet IEE 519 harmonic distortion levels. **Booth #657**

BURKERT FLUID CONTROL SYSTEMS, the world leader in fluid control systems, offers the most innovative and reliable process actuation/control systems, mass flow meters/controllers and valves, including ball, diaphragm, globe, solenoid and Y-pattern. Burkert solutions find use in markets including water treatment, food and beverage, pharmaceutical and medical devices, to biotechnology, textile, semiconductor and industrial processing. **Booth #837**

CONCEPT SYSTEMS is an innovative systems integration team with the expertise you demand for your automated control and information systems needs. Integrate Concept Systems as your team's technology resource and start benefiting today. Whether your goal is increased production, improved quality or increased efficiency, Concept Systems can help you make more. **Booth # 457**

FRONTLINE manufactures communication analyzers for monitoring and decoding data transmissions via networks and industrial buses. NetDecoder features byte-level information, industrial protocol decoding and enables rapid development of proprietary decodes. NetDecoder decreases equipment and application development time, network troubleshooting time and improves mean time to repair. **Booth # 100**

Reduce arc flash risk! How? GRACE ENGINEERED PRODUCTS, maker of

Continued from p. 34

- » Improve your product's time-to-market.
- » Increase your company's profitability.
- » Develop asset-management and optimization strategies.

» Manage manufacturing business risk. Featuring Rockwell Automation products and programs, as well as those of its Encompass Partners™ and Solution Providers, the event delves into automation complexities to shed light

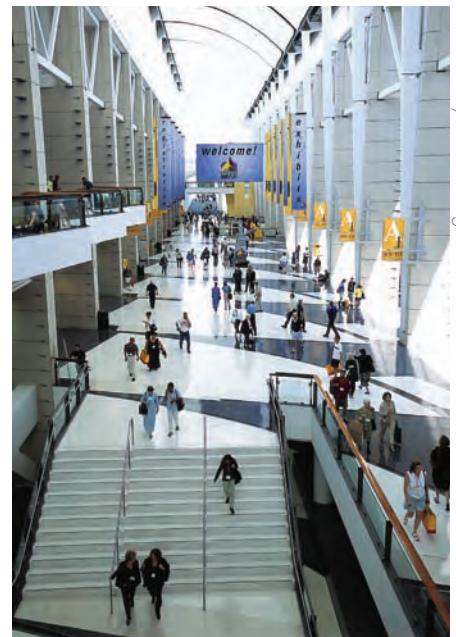


Photo courtesy of the Chicago Convention and Tourism Bureau.

The Automation Fair 2007 Event is taking place in the new McCormick Place West. Chicago's McCormick Place has the largest amount of exhibit space of any convention center in the country, with 2.2 million square feet.

on new ways of thinking and problem-solving. Expanded for this year are industry forums that cover these industries: automotive, biofuels, food and beverage, global machine builders, household and personal care, life sciences, oil and gas, tire and rubber, and water wastewater. Each forum is three hours long and provides an opportunity to see how companies are employing integrated manufacturing and information systems to achieve their goals.

The Automation Fair® event also offers the opportunity to attend 14 technical sessions that cover the following topics: control design, data management, Intelligent Motor Control, maintenance, migration, networks, power control, process control, RFID, safety, standards and wireless. The Automation Fair® 2007 event is free to attendees. Contact your local Rockwell Automation distributor or representative for more information, or visit [www.automationfair.com](http://www.automationfair.com). With so much to do and see, you won't want to miss out on all Chicago has to offer. □

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## >> Rockwell Automation Products and Services Exhibits\*

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Safety.....	440
Services & Support .....	545
Industry Solutions.....	621
Intelligent Motor Control.....	645, 653
Essential Components.....	854
Automation Fair Merchandise.....	880

\*Current as of August 2007.

## >> Chicago Trivia

You'll feel like a native Chicagoan when you recite these bits of Windy City trivia.

- >> The world's longest street is Chicago's Western Avenue.
- >> The Chicago Post Office at 433 W. Van Buren is the only postal facility in the world through which you can drive a car.
- >> The term "jazz" was coined in Chicago in 1914. The city's native musicians included band leader Benny Goodman and drummer Gene Krupa.
- >> Chicago is home to the Lincoln Park Zoo, which is one of the last free zoos.
- >> Chicago is the favorite road city for major-league baseball players, according to *Sports Illustrated* magazine's 2003 Player Survey.
- >> Chicago is home to the Harold Washington Library, the world's largest public library.
- >> R.S. Ownes, a Chicago firm, manufactures all Oscar statues for the Academy Awards.
- >> Chicago is home to the Museum Campus, which connects three world-class museums: the Field Museum of Natural History, the Adler Planetarium, and the John G. Shedd Aquarium and Oceanarium.

*Courtesy of the Chicago Convention and Tourism Bureau.*

GracePorts, is featuring its newest innovation at this year's Automation Fair® event. ChekVolt is a noncontact voltage portal that allows electrical isolation to be pre-verified through the door with any detector pen. Find voltage before it finds you! Don't miss out! **Booth #403**

HARDY INSTRUMENTS' HI 4050 general-purpose weight controller is available in panel, remote or blind DIN rail mounting. It installs quickly with no special holes to cut into a panel. The controller comes standard with EtherNet TCP/IP and has an available EtherNet/IP or DeviceNet network card. **Booth # 735**

HOFFMAN will display the modular CC3000 Operator Interface Enclosure. It provides size flexibility for protecting HMIs. A stainless steel cable tray protects washdown-rated cabling from contaminants. SEQUESTER external disconnect enclosures help mitigate arc flash risk by isolating the fused disconnect switch from the main control panel. **Booth # 821**

As the largest circuit protection company in the world, LITTELFUSE will exhibit the latest circuit-protection technology. We have superior fuse technology for overcurrent protection and the broadest portfolio of overvoltage devices to guard against transient voltage surges from sources like lightning and switching power supplies. Expertise applied — answers delivered. **Booth # 665**

The MARC Omnii-Comm protocol converter from MILLE enables connection between devices using different communication protocols. A new Ethernet communication option significantly expands the number and type of applications where this module is used. This module supports more than 60 serial protocols on three serial ports, plus Modbus/TCP, and EtherNet/IP on 10/100 MBs networks. **Booth # 525**

MTE CORP. is a global leader in the manufacture of power quality components for

variable-speed and other automation systems. MTE will be displaying our portfolio of line/load reactors, harmonic input filters, and our suite of motor protection devices. Visit us at the Fair. **Booth # 454**

NUMATICS, INC. is a leading manufacturer of pneumatic and motion-control products. Our broad spectrum of standard, custom-developed products and application components has made a significant impact on pneumatic innovation and technology. **Booth # 521**

ONLINE DEVELOPMENT will demonstrate its solutions for connecting ControlLogix® PACs to databases and messaging systems, as well as legacy SLC™, PLC-2® and PLC-5® PLCs. Their line of data appliances features fast installation and setup without the need for programming. **Booth # 224**

From static modeling in design stages through full 3D emulation in the execution phase, POLYTRON engineers cover the gamut of modeling technology. Their PolySim services allow early predictability of system performance, design fine-tuning early in the process, PLC code testing before installation and enhanced operator training prior to start-up. **Booth # 661**

POST GLOVER features the Pulser Plus Pro HRG unit, sized to mount in Allen-Bradley® MCCs. The unit highlights the importance of high-resistance grounding in reducing arc flash potential and locating ground faults. Post Glover also will display its line of dynamic braking resistors for PowerFlex® drives. **Booth # 765**

PROSOFT TECHNOLOGY has added its 802.11abg Industrial Hotspot to its line of Radiolinx products. The RLX-IHW functions as a wireless access point, repeater or client, and is designed for global installations. It offers high-speed wireless Ethernet communications, including EtherNet/IP for linking automation systems, Ethernet I/O, video cameras and more. **Booth # 609**

# Be There

QUEST TECHNICAL SOLUTIONS will display its Modicon EtherNet/IP and GE Genius EtherNet/IP legacy network interfaces. Both interfaces allow customers to maintain existing Modicon Quantum, 800 and 200 Series S908 Remote or GE Genius I/O while upgrading to ControlLogix® processors for control of their legacy I/O. **Booth # 305**

REIMELT CORP. is a Rockwell Automation Solution Provider and CSIA Associate Member. The company delivers system integration and process control projects to the food and beverage, home/health/beauty, plastics/comounding and pharmaceutical/nutraceuticals industries. Reimelt has extensive process experience handling powders and liquids for batch processing applications. Register at their booth to win a free iPod®. **Booth # 232**

With a complete line of panel-building components that include Ty-Duct, Ty-Rap, E-Z-Code, Shrink-Kon, T&B Fittings, Russellstoll, Pos-E-Kon, Sta-Kon, Blackburn and Color-Keyed, THOMAS & BETTS offers one-source accountability, product quality and support with product selection, installation and maintenance. Visit our booth. **Booth # 632**

SCHENCK ACCURATE is an ISO 9001-certified manufacturer of volumetric and gravimetric bulk solids feeders, vibratory feeders, weighfeeders, flow meters, bulk bag frames and control systems. Shown in our booth will be DeviceNet- and Ethernet-compatible Intecont and DISOCONT loss-in-weight feeder controls, along with a MECHATRON gravimetric feeder. **Booth # 103**

The AirLink Raven family of products from SIERRA WIRELESS can help you improve the efficiency of your automation projects by enabling simple, cost-effective, real-time communications to Allen-Bradley® controllers and switches over cellular networks. Sierra's ALEOS has built-in intelligence for communicating with your current automation

equipment and managing the wireless network connection. **Booth # 235**

STONE TECHNOLOGIES is a premier food and beverage and consumer product system integrator. Stop by and meet our industry experts to discuss your batch, process and MES challenges. We will demonstrate our experience and discuss successful solutions in similar applications to get the most out of your process control and plant floor information systems. **Booth # 101**

TCI will display the new H5 Active Line Conditioner, which corrects harmonic distortion while controlling the total power factor of the load, thus maximizing process efficiency. A typical panel, including an HG7 harmonic filter, RFI filter and a dv/dt filter, will be available for hands-on experience. **Booth # 652**

Visit SYTECH, "TheReportCompany.com." Are you looking for a powerful reporting solution that combines Microsoft Excel with RSLinx®, RSView®, RSSql™, OPC, OPC-HDA and more? If so, our award-winning product XL-Reporter is for you! Visit our booth to discover how easy automatic report generation has become. **Booth # 202**

TOPWORX supplies valve networking solutions for plants, platforms and pipelines. Our Valvetop discrete valve controllers connect automated on/off valves to FOUNDATION Fieldbus and DeviceNet, are globally certified for use in all hazardous areas, and interface seamlessly with Rockwell Automation systems. **Booth # 342**

WOODHEAD INDUSTRIES, a division of Molex, will show its BradCommunication network interface cards, gateways and diagnostic tools for Rockwell Automation networks. New products include the SST Ethernet/Serial interface for ControlLogix® and the NetDoctor, a device that monitors a DeviceNet network, then stores the information on an HMI display residing on Ethernet. **Booth # 811**



Chicago is famous for its great variety of restaurants and night life. Visit [www.choosechicago.com](http://www.choosechicago.com) for restaurant and entertainment information.

Photo courtesy of the Chicago Convention and Tourism Bureau.

## >> Food Tidbits

Chicago is one of the United States' great food towns. You'll find thousands of restaurants that feature cuisine from just about every culture. It also is home to:

- >> Nabisco, the world's largest cookie and cracker factory, located at 7300 S. Kedzie Avenue.
- >> The world's largest ice cream cone factory, Keebler, located at 10839 S. Langleys Avenue.
- >> The Taste of Chicago, the world's largest free outdoor food festival, which attracted a record 3.6 million people in July.

*Courtesy of the Chicago Convention and Tourism Bureau.*

## >> Join the Process Solutions User Group

Be a part of the 6th Annual Rockwell Automation Process Solutions User Group (PSUG), which meets Nov. 12-13 and gives participants the opportunity to share their user experiences with products and solutions.

The meeting is being held at the: McCormick West Convention Center  
2301 South Lake Shore Drive  
Chicago, IL 60616

The registration fee for this event is \$325 if you register by Sept. 1 and \$350 if you register after Sept. 1. The fee includes all sessions, refreshments, meals and Monday night's entertainment.

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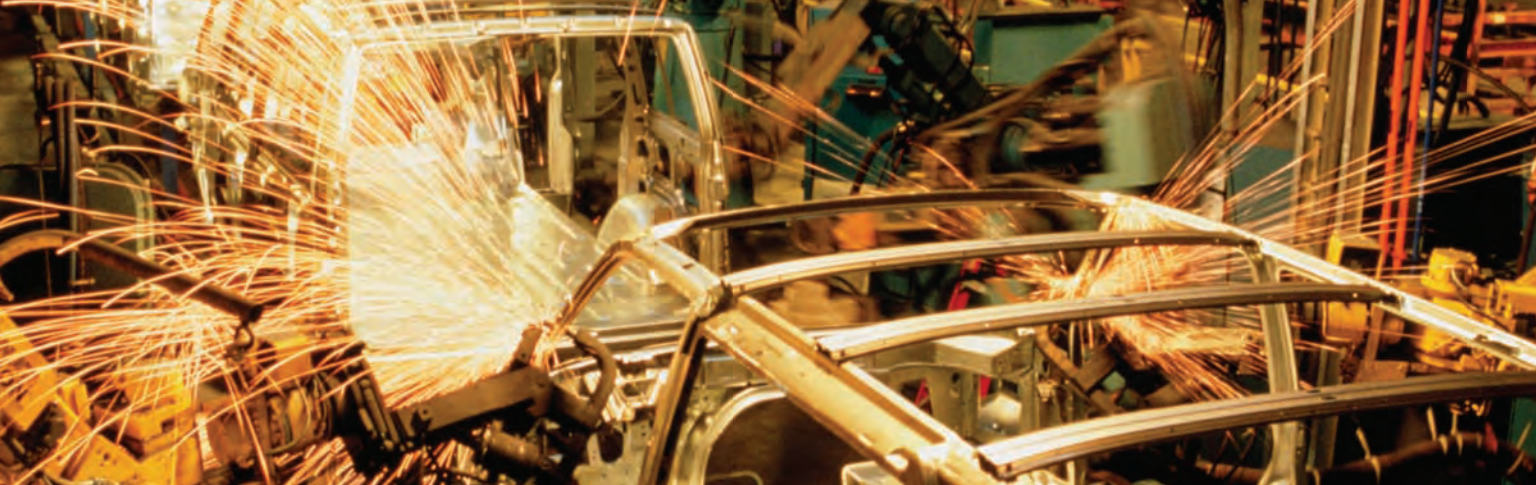
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# Make Manufacturing Your Automotive Competitive Advantage

Manufacturers should leverage systems built around open standards and use technology to get ahead.

*By John Genovesi, Vice President of Automotive, Tire and Rubber Industry, Rockwell Automation*

**>>** The automotive industry is in one of the most challenging periods in its history. Shifts in consumer preferences and pressures on global fuel consumption are driving brand owners to reinvent their automobiles while still delivering the quality that reflects their brands. Adding to the challenge are new government standards, and the emergence of new markets in Asia, Latin America and Eastern Europe. For automotive manufacturers, using manufacturing as a competi-

**Consumer Preference:** Body styles used to stay on the market for more than five years, and buyers had limited color and accessory options. Now, consumers expect the same level of variety and flexibility in their automobile choices as they have in other facets of their buying. This has driven significant changes in the design, manufacturing and, ultimately, marketing of vehicles by North American, Asian and European automakers who are responsible for 75 percent of the world's automotive production and sales.

set of customer requirements than other traditional markets. For instance, in an emerging economy, flexibility and options may not be as important as cost.

**Regulatory Compliance:** Manufacturers and their suppliers must adhere to increased regulations that require close production tracking and constant demands to provide a safe working environment in their factories. At the same time, manufacturers are under increasing pressure to put a greater focus on efficiency and asset utilization by meeting faster

“The smart manufacturer will start to leverage systems built around open standards and take advantage of technologies to gain a competitive advantage.”

— John Genovesi, Vice President of Automotive, Tire and Rubber Industry, Rockwell Automation



tive advantage is becoming the key to maintaining leadership for some, and a means of survival for others.

Consumer preferences, emerging global markets and ongoing regulatory demand are driving automotive manufacturing. A closer look at each reveals the need for manufacturers to establish an information-enabled enterprise.

**Emerging Global Markets:** The rising disposable income in emerging markets has compelled manufacturers to re-think manufacturing strategies. Today, more and more manufacturers are seeking ways to locate manufacturing physically closer to the markets they're serving. In addition, the automobiles made for these markets have to meet a different

time-to-market strategies and reducing production costs. To combat these changes, automotive manufacturers must focus on manufacturing as a core piece of their business — one that can provide them with a true competitive advantage. □

**Rockwell Automation  
Automotive Industry**

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In the

# Top Tier

By Lary  
Marshall,  
Automotive  
Market  
Development  
Manager,  
Rockwell  
Automation

GuardLogix controller helps automotive OEM reduce installation time by 65 percent and increase efficiency by 50 percent.

»» In the intensely competitive automotive manufacturing industry, the ability to reduce costs and increase productivity while maintaining a safe work environment is vital to a company's survival. No one understands this better than International Automation.

Based in Windsor, Ontario, International Automation retrofits stamping machines for large tandem lines, most often for Tier One suppliers to the automotive industry. A typical tandem line

is 100 feet to 150 feet long and consists of five to seven stamping presses for metal forming. International Automation develops anywhere from four to six tandem lines per year — each requiring about eight weeks to produce — and exports them around the world.

To maintain its competitive edge, the company sought a new control system for its stamping machines that would not only ensure high quality and reduce start-up costs, but also

would boost productivity while complying with increasingly stringent safety regulations. After implementing the Allen-Bradley® GuardLogix™ control system from Rockwell Automation®, International Automation saved customers \$1 million in start-up costs.

**Focus on Quality, Productivity**  
Tier suppliers in today's automotive market are developing more of the components for brand owners, thus taking on more of



the responsibility for ensuring quality and reliability, including servicing and fulfilling all related warranty obligations. As a result, tier suppliers are looking to increase throughput and are making sure they are creating reliable, high-quality products.

In addition to helping its customers meet these demands, International Automation wanted to provide them with a flexible machine that they could easily integrate into their existing plants. With reduced downtime being a universal goal among manufacturers, producing a system that would have minimal effect on production was crucial.

Equally critical was International Automation's ability to meet all industry safety standards while ensuring the safety components it used in its upgrade also improved cost structure and increased productivity.

## Safety Control Partners

International Automation first considered upgrading its existing relay system. However, not only would the upgrade itself be costly, it would require a complete shutdown of the customer's production line for several days. After considering a number of options, International Automation chose to implement the Allen-Bradley GuardLogix controller from Rockwell Automation in its machines. International Automation's first machine with GuardLogix was made for a Tier 1 automotive stamping supplier.

"It was clear that Rockwell Automation offered the best control solution to meet all of our specific requirements," says Joe Quigg, corporate controls engineering manager, International Automation. "This was the only solution flexible enough to do the job, and it integrated seamlessly into the existing line."

As part of the Rockwell Automation Integrated Architecture™, Logix Programmable Automation Control-

lers (PACs) provide a single control architecture for control systems.

The GuardLogix safety controller combines the flexibility and high performance of the Logix platform with integrated safety control features to meet the level of protection required for a safety control application, Safety Integrity Level 3 (SIL 3).

GuardLogix is programmed using Rockwell Software® RSLogix™ 5000 programming software, the same development tool used by all Allen-Bradley Logix PACs, providing a familiar, easy-to-use environment for programmers. RSLogix 5000 software also helps manage safety memory so users don't have to manually manage the separation of standard and safety memory, or worry about partitioning logic to isolate safety-related data.

Using the Rockwell Software FactoryTalk® suite of services, the new control system allows the customer to access production information using industrial PCs. A plant manager can access production reports or make data changes from his or her office.

## Increased Production

With the fully implemented GuardLogix solution, International Automation saw immediate results that went beyond its expectations.

Most drastic was the savings in start-up costs. For its first customer, International Automation saved more than \$1 million in start-up costs alone. That amount is comparable with the customer's average savings expectations after one year, but today International Automation is now able to deliver these savings in the start-up phase.

In addition, International Automation saw a major reduction in programming time.

With programming typically taking anywhere from two to three weeks on a standard system, International Automation could write the program for the new safety control system in eight hours. The GuardLogix system uses certified blocks to emulate the input functionality of a safety relay rather than using a relay system.

"Programming a control system of this magnitude can be a complex, time-consuming endeavor," Quigg says. "However, in this case, we actually thought we had missed something because it seemed too simple."

International Automation also saw a major reduction in its installation time. Due to the simplicity of the system compared to relay-based solutions, the impact on production was minimal. As a result, International Automation was able to complete the installation of the new system in five days rather than 14, a 65 percent reduction. This helped minimize the impact on production, a key customer requirement.

Flexibility was also greatly improved. Not only can the system work with any brand of robot, but with the appropriate communications it can run with any type of press. In addition, with the GuardLogix/DeviceNet solution, users can move the individual machines around quite easily compared to the traditional relay system because of the reduced wiring.



The Allen-Bradley GuardLogix controller helps International Automation reduce installation time and increase efficiency.

All safety devices, such as emergency stops and light curtains, are connected via a single cable using DeviceNet Safety I/O to control and monitor safety circuits and detect failures at the I/O and field wiring levels.

The new control platform also saved considerable floor space. At about half

Production efficiency was another area of major improvement. Before using GuardLogix, each of the five tandem lines was 40 percent efficient and produced between 85 and 120 parts per hour. Now, with GuardLogix, the five tandem lines' efficiency rate is 90 percent, with each

Automation users and manufacturers continue to look for flexible solutions that can help address global safety standards and regulations while meeting tighter productivity, quality and cost-efficiency demands. By upgrading to a flexible control platform that combines high performance, ease of integration and safety features, International Automation was able to meet its customers' requirements while maintaining its all-important competitive advantage. ■

Rockwell Automation Automotive Industry Solutions

[www.rockwellautomation.com/go/tjauto](http://www.rockwellautomation.com/go/tjauto)

Allen-Bradley GuardLogix

[www.ab.com/go/guardlogix-tj](http://www.ab.com/go/guardlogix-tj)

Allen-Bradley RSLogix 5000 v.16

[www.rockwellautomation.com/go/tjrsl](http://www.rockwellautomation.com/go/tjrsl)

## With the fully implemented GuardLogix solution, International Automation saw immediate results that went beyond the company's expectations.

the size of the old system, the industrial PC and GuardLogix controllers fit in the same enclosure, eliminating a 3' x 3' cabinet. The new system also required fewer relays and less wiring, further reducing overall installation cost.

tandem producing an average of 500 parts per hour. The number of operators required for the entire line went from three to one, reducing labor costs and minimizing the potential for human error.

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# MIGRATION PLAN SETS STAGE FOR CHANGE

Allen-Bradley controls and Rockwell Automation migration expertise help building materials manufacturer make smooth equipment upgrades.

➤ At the CertainTeed insulation plant in Kansas City, Kansas, project manager Cam Bell walks to the wooden design table in his office and takes off a hard hat that was once white, but has since seen 15 years of scuff marks and stickers. “The day it has to be replaced is the day I retire,” he jokes. Fortunately, Bell doesn’t feel the same way about change when it comes to the technology in his plant.

Headquartered in Valley Forge, Pa., CertainTeed manufactures building materials including roofing, siding, windows, foundations and piping. As the senior project leader in Kansas City, Bell oversees the design and engineering of production lines that make one million pounds of insulation a day when running at typical 98 percent efficiency.

As the senior project leader in CertainTeed’s Kansas City plant, Cam Bell oversees the design and engineering of production lines that make one million pounds of insulation a day.





The K-21 line is one of the biggest at the Kansas City plant. It's divided into a "hot end" — where raw materials are brought in — and the "cold end" — where the finished insulation is packaged. Bell knows that to stay competitive, he must keep the equipment in the facility well maintained and up to date. That has driven his near-constant job of guiding the production line through multiple control upgrades and equipment migration projects.

### Prepared for Change

A successful migration starts with detailed preparation that includes comprehensive system evaluation, parts selection and installation plans. The best preparation of all, however, is choosing equipment that is built with future change in mind.

Just a few years ago, CertainTeed's facility was running entirely on Rockwell Automation® control systems — Allen-Bradley® PLC-2® controllers over a 1771 Remote I/O™ network with Allen-Bradley PanelView™ 1200 terminals as the operator interface. To take advantage of changes in automated manufacturing, the facility began a project to upgrade to the Allen-Bradley PLC-5® controllers and the more advanced PanelView 550 and PanelView 1400E operator interface devices.

"When we were getting started, I remember anticipating a lot of headaches," Bell recalls. "The upgrade itself seemed like it would be expensive and time consuming. And I was also wor-



Above: In the first step of migration, the Kansas City facility upgraded to Allen-Bradley PLC-5 controllers and PanelView 550 and PanelView 1400E operator interface devices.

Below: PLC-5 controllers now are becoming legacy products at CertainTeed, and the company is transitioning to Allen-Bradley ControlLogix automation controllers.



CertainTeed insulation is installed at Busch Stadium in St. Louis. The company manufactures building materials that include roofing, siding, windows, foundations and piping.

ried about losing time and production while getting the staff up to speed on the new controls.”

However, the changeover was much smoother than Bell imagined. The PLC-5 controller was able to integrate with the existing 1771 I/O network, saving CertainTeed considerable rewiring costs and design/configuration time. Furthermore, Rockwell Automation designs its products to have maximum consistency and forward migration. As a result, the machine operators didn't notice a difference in the way the machine acted and looked. CertainTeed could make use of its previous training investments, and the staff was able to transfer knowledge of the PLC-2 to the new PLC-5, saving time and money on any training that would typically have been required for new equipment.

### Proven Solutions as a Foundation

Now the PLC-5 controllers are becoming legacy products, and CertainTeed has begun the next transition to Allen-Bradley ControlLogix® automation controllers. ControlLogix controllers are a key element in the Rockwell Automation Logix Control platform — an integrated control environment consisting of controllers, networking, operator interface and software that allows for multidisciplinary control within a single platform. Machine operators at CertainTeed have had experience with ControlLogix on their other lines and have had no problem using the ControlLogix platform because of its commonality with the PLC-5 controllers.

In addition, the recent upgrades on the K-21 line have included the implementation of newer Allen-Bradley PanelView™ Plus human-machine interface (HMI) screens, as well as the replacement of an older Remote I/O network with an EtherNet/IP network. □

CertainTeed

[www.certainteeted.com](http://www.certainteeted.com)

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# True Pro

Rockwell Automation Integrated  
ease of use and plant-wide view

➤ The ARC Advisory Group has a model called the Collaborative Process Automation System (CPAS) framework that it considers as a benchmark for process automation functionality both today and in the future. The Rockwell Automation Integrated Architecture™ conforms to the CPAS model in key areas. From engineering and configuration to a common hardware platform, it can present information in context to the right people at the right time from any point within the system.

Rockwell Automation developed its process automation architecture by leveraging how products were applied in process applications. The company is providing the functionality for true process control.

Rockwell Automation Integrated Architecture incorporates a unified human-machine interface (HMI), control platform and engineering tools. The two primary layers of Rockwell Automation Integrated Architecture are the Logix Control Platform and the FactoryTalk® integrated production and performance suite.

The Logix Control Platform provides a unified infrastructure that can address continuous, as well as batch and discrete, applications. A unified engineering environment is a core CPAS requirement. The Rockwell Automation Integrated Architecture provides a consistent look and feel for all control strategy development tasks and a consistent environment for de-



# Process Control

Architecture supports process automation system scalability, of control. – By Craig Resnick, Research Director, ARC Advisory Group

veloping and testing control applications. The Logix Control Platform configuration environment covers process control, motion, safety, discrete control and drives applications. This enables information to be provided in context to the users or other applications in the environment.

FactoryTalk encapsulates the production management environment and includes applications such as batch control, batch management, asset management and integration with enterprise resource planning (ERP) systems.

ARC is a strong advocate of standards, and Integrated Architecture incorporates standards such as IEC 61131-3 programming, EDDL, FDT/DTM, FOUNDATION Fieldbus, HART, EtherNet/IP, DeviceNet and ControlNet. ISA-88 hierarchies are implemented in the system, as are structural and transactional elements of the ISA-95 standard. Security is in conformance with the ISA-99 standard.

Rockwell Automation offers premier integration to their installed base by seamlessly connecting its FactoryTalk suite with its multidisciplined Logix Control Platform, enabling end-to-end production control and use of information.

## Unified Production Management Framework

The ability to turn plant-floor data into usable information depends on a production management environment that is seamlessly integrated with control and automation, as well as ERP and other business and production planning sys-

tems. FactoryTalk serves as the single software environment for production management applications within the Rockwell Automation Integrated Architecture. The applications are placed under six primary production disciplines, which map to the ARC definition of collaborative production management:

1. **Production Management** involves real-time coordination across plant-wide production processes, such as order scheduling and execution, order and material tracking and genealogy, resource management and multi-site production synchronization.
2. **Data Management** involves the tools and methods to use for collecting, transforming and integrating production information.
3. **Performance and Visibility** enable the creation of windows into the process so manufacturers can make decisions.

4. **Quality and Compliance** involves the tools that ensure that operational processes and procedures meet standards or specifications, simplify regulatory compliance and reporting, enhance product and process consistency, and improve first-pass quality.

5. **Asset Management** involves the tools that optimize maintenance and plant operations to improve resource availability, audit operator actions, and provide risk-mitigation and change-management procedures.

6. **Design and Configuration** is done through an integrated environment for creating, modeling and programming production processes such as automation control programming.

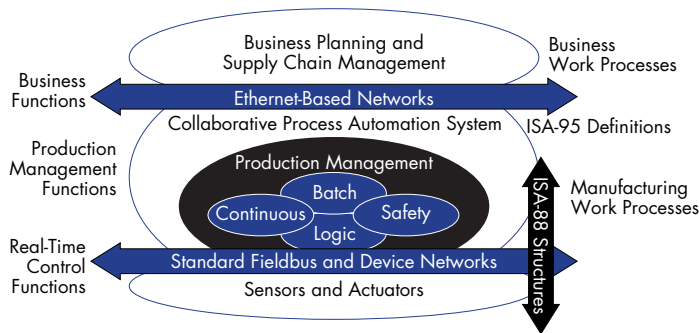
**Process Migration Strategies**  
ARC estimates that \$65 billion worth of installed automation systems are at the end of their life cycles. Therefore,

## >> What is Premier Integration?

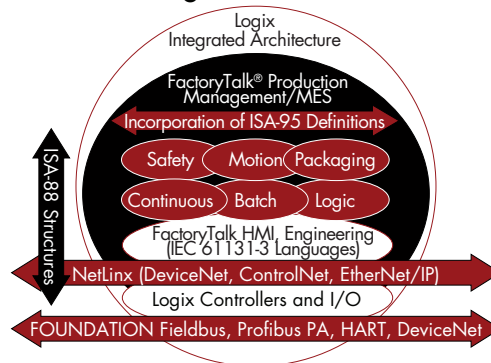
Rockwell Automation Integrated Architecture uses four core, integrated technologies to provide unrivaled functionality to users: Logix (control engine), NetLinx (CIP Networks), View (visualization) and FactoryTalk (information services-oriented architecture).

Premier integration between Integrated Architecture components leverages these core technologies to provide additional customer value. For example, whereas the Logix controller family is a very robust, powerful family of controllers and may be used with other networks and HMI systems, the full value of Integrated Architecture is realized when combining these technologies to reduce development, start-up, integration, and maintenance time by providing tag reuse and sharing, seamless information flow and automatic tag generation. Using premier integration, development time of a drive system is reduced by providing profiles, parameters and standardized tags that the user can easily install using a pick list. Copy and paste programming makes configuring multiple drives effortless.

# Integrated Architecture™: A Collaborative Process System Providing Plant-Wide Control



**ARC's CPAS Functional View**



**Integrated Architecture:  
A Standards-Based Control Environment**

ARC Advisory Group considers its CPAS model a benchmark for process automation system functionality. The Rockwell Automation Integrated Architecture conforms to the CPAS model in key areas.

control system migration strategies are important.

Rockwell Automation has a strategy for control system migration that addresses its installed base of process automation systems and competitive platforms. The company also provides migration of Rockwell Automation and non-Rockwell Automation programmable logic controllers (PLCs). A core part of the Integrated Architecture is its networking, interoperability and connectivity to legacy systems.

To protect an end user's intellectual property and engineering investment, Rockwell Automation promotes a phased approach to migration. This phased migration starts at the HMI

level and drills down to the controller and I/O level. The company also offers services for converting custom graphics and control strategies.

At the control layer, Rockwell Automation Integrated Architecture offers interoperability with Rockwell Automation and competitors' process controllers and PLCs. At the I/O layer, Rockwell Automation Integrated Architecture offers migration to competitors' systems using either cabling solutions or, in the case of many competitor PLCs, swing-arm interfaces.

## Positioned to Grow

ARC is encouraged that the Rockwell Automation Integrated Archi-

ture's portfolio of modules and solutions can provide a single infrastructure for plant-wide information management. The company's investment and focus on the plant-wide information space is now paying dividends in the form of a unique strategy and progress. □

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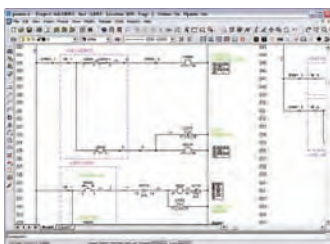
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### Power MICE MS-4128-5



For Ethernet networks that demanded high availability in extreme environments, there was the MICE MS3124-4. Now Hirschmann introduces the Power MICE (Modular Industrial Communication Equipment) for high-performance demands and high bandwidth. Gigabit HIPER-Ring and Spanning Tree options guarantee continuous communication. It is important to be flexible and accommodate future extensions, network topologies or technical developments. With this in mind, Hirschmann offers a Gigabit solution for the DIN rail — with the capabilities of a large office Ethernet switch in industrial design.

**HIRSCHMANN AUTOMATION AND CONTROL, INC.**

## EXPANDING WATER DEMANDS ARE NO PROBLEM

Lakeway Municipal Utility District migrates to an Ethernet network to keep up with demand.

By Jim Garrard, Data-Linc Group, and John Gordon, TEI Controls



➤ Lakeway Municipal Utility District, established in 1972 and located west of Austin, Texas, is responsible for the total water supply, wastewater treatment and water recycling operation for an expanding community of 10,000. Lakeway's primary monitoring tasks are collecting real-time weather data, calculating irrigation application rates for disposal of excess reuse water, and gathering data used in research demonstration studies. The area's growth and the resulting data accessibility and collection demands led to an extensive upgrade, requiring designers to not only meet current expansion, but also to provide flexibility for future upgrades.

Lakeway overcame these challenges incrementally by abandoning its telephone modem method of communication, moving to an Ethernet network and converting a few key hubs to Allen-Bradley® SLC 5/05 Ethernet programmable logic controllers (PLCs). A strategic communication infrastructure was designed from a wireless approach, using Rockwell Automation® Encompass™ Partner Data-Linc Group's Ethernet radio modems operating in the license-free 902- 928 MHz ISM band.

## In Transition

To economically expand Lakeway's legacy system, close the data acquisition gap and allow for future growth, engineers designed a SCADA system that interfaced phone line modems with Allen-Bradley PLCs. The SCADA system consisted of one local operator workstation site at the Lakeway office, which was linked to one PLC and one remote PLC site. Local and remote sites were connected by dedicated full duplex telephone modems.

As the community's water needs grew, so did Lakeway. In 1996, Lakeway added an operator workstation to the SCADA system at the water production plant. Its primary function was to interface with two PLCs at the plant site, and communicate by telephone modem with a remote PLC at a raw water pump barge. The main PLC at the water plant was tied by telephone modems to the first operator station at the Lakeway office.

In 1998, the water portion of the SCADA system was expanded again to include two booster stations with PLCs that were connected by phone line modem to the water plant PLC and operator workstation. At this stage, the phone line modem's low data rates and the DH485 protocol were creating data failures and loss-of-communications warnings.

In 2000, Lakeway installed a new wastewater system with four remote sites for collection, treatment, storage, pumping and delivery of reuse water to customers. An additional expansion was planned for 2001 on another wastewater system. The outcome of five years of growth would have been a system of four separate networks: 26 PLCs and six PCs at four operator interface sites with the system continuing to communicate over leased lines.

Because the PLCs controlled all processes and required significant operator interaction, labor costs and margin of error became concerns. Lakeway's management sought increased efficiency and decreased error rates by identifying five requirements:

- >>Accessibility of all PLC data by each of the PCs.
- >>Real-time operations data.
- >>Maintenance or improvement of system data transmission speeds.
- >>Flexibility for expansion.



Eight of the modems used in the Lakeway project were the higher-throughput SRM7210E wireless Ethernet design from Data-Linc, used to increase RF data rates up to 867 Kbps.

- >>Elimination of leased-line charges.

Constraints in the communication protocol of the legacy 1995 system hindered meeting these requirements and restricted expansion in other areas.

## Plan B

Lakeway also conquered these obstacles incrementally. An earlier test of Data-Linc Ethernet modems had demonstrated reliable performance for the communication link, ease of installation and superior technical support. Because Data-Linc modems are factory configured for each individual application, they interface seamlessly with Allen-Bradley PLCs.

Lakeway's resulting network design, created by TEI Controls of Ce-

dar Park, Texas, in 2001, consisted of a central radio reception site that was in "line of sight" to the four operations centers. At each center, a PLC was converted to the SLC 5/05 processor as a second hub to other PLCs. Four point-to-point pairs of Data-Linc Ethernet radio modems created "trunk lines" for data flow between the secondary hub PLCs and the four operations centers. An additional Ethernet point-to-multipoint radio link was established for communications with the remote SLC 5/05 PLCs.

The Ethernet radios function as an Ethernet bridge and don't require a network IP address. All sites communicate through the five master Ethernet radio modems (four point-to-point, one multipoint) connected into an Ethernet switch at the central radio reception site, providing seamless links.

At the remote operations sites, the secondary hub PLC, SCADA PC and Ethernet radio modem are connected via a five- or eight-slot Ethernet hub. This allows the user to plug a laptop computer into the hub to become part of the network. The system design connected all five local area networks (LANs) to one wide area network (WAN). This created an inclusive communication network and allowed Lakeway to optimize its internal management software.

## From Legacy to Cutting Edge

Due to continuing rapid growth and increasing water demand, Lakeway again expanded its system in 2006 by installing 12 additional Ethernet radio modems. Eight of the modems were of the higher-throughput SRM7210E wireless Ethernet design to increase RF data rates up to 867 Kbps. These new modems replaced the slower-rate Ethernet modems on the point-to-point trunk

lines. The replaced units were rotated to bring more PLCs onto the Ethernet grid, using Ethernet adaptor modules such as the Allen-Bradley NET-ENI, or by changing to SLC 5/05 processors or an Allen-Bradley MicroLogix™ 1100.

The design of the Eagle station system using the SRM7210E configured as master radios allows the masters at this location to communicate with any of the other end-user equipment in the network. Using peer-to-peer commu-

nication, any site can communicate with any other site. It also provides greatly increased throughput. The maximum radio network throughput shared by all remote sites is 60 Kbps. With six remote sites, each site would get an average throughput of one-sixth, or about 10 Kbps. But with the point-to-point configuration design, the throughput would increase tenfold to 100 Kbps per site.

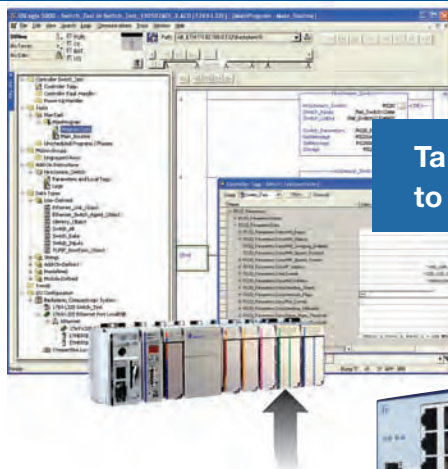
With high-speed Data-Linc Ethernet modems, the throughput has increased sixfold to a point where any PLC appears to be hooked directly to the desktop PC at any one of the four operations centers. The logic program upgrades of all PLCs at Lakeway are now performed from any of the four operations centers using Rockwell Software® RSLinx® and RSLogix™ 500 software from Rockwell Automation.

Lakeway is using LincView™ OPC, Data-Linc's diagnostic radio-frequency (RF) network-management software. The final communication network offers high data-transfer rates, Data-Linc's robust Smart Spectrum™ frequency-hopping technology, transparent multipoint functionality and the reliability of the 902-928 MHz license-free ISM band.

The wireless solution eliminates the expense of miles of cable installation and the volatile, recurring cost of leased line communication. □

*Rockwell Automation Encompass Partner Data-Linc Group, based in Bellevue, Wash., offers industrial-grade wireless and wire modems.*

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**Taking Switch Management to the PLC**



## Introducing Hirschmann's EtherNet/IP Profile Switch

Now you can manage, monitor and configure your Ethernet switches directly in your PLC programming software (Rockwell's RSLogix™5000). Plus, you'll have all switch data readily accessible to the HMI for even easier network management.

Having network data in the PLC facilitates seamless integration and allows you to incorporate information such as switch status, port link status, IGMP settings, network counters — even enable and disable individual ports.

Sample files are available to make the integration process even easier (for RSLogix™5000 and RSView® Studio). Simply add a switch to the I/O tree just like a rack of I/O, drive or other node. Switch parameters are then exposed as tags and are available for use in the programming code. Sample files can be found at <http://samplecode.rockwellautomation.com> — search Title — Hirschmann.

The EtherNet/IP profile is available for all Hirschmann Open Rail switches (RS20/30 and MS20/30). Switches already in the field can be upgraded with a simple firmware update.

Depend on Hirschmann for all your industrial Ethernet networking challenges.

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# GET A HANDLE ON HAZARDOUS VOLTAGE

Thru-door voltage indicators streamline paper mill LOTO procedures.

By Philip Allen, Grace Engineered Products, Inc., and Mark Higginson, NORPAC



➤➤ The sole purpose of a voltage indicator is to alert maintenance workers to the presence of voltage via flashing light emitting diodes (LEDs). A pushbutton-sized device that is installed on the outside of electrical panels and wired internally to the primary incoming power source provides “thru-door” voltage indication for personnel. To maximize safety, you must understand how to properly apply a voltage indicator and correctly incorporate it into an electrical or mechanical lockout/tagout (LOTO) safety procedure.

## A Close Call

Near-death experiences among paper mill electricians are all too common. The following story is just one example.

A combination circuit breaker/welding outlet failed to provide power to the welder. The maintenance electrician began to replace the outlet. Casually, his coworker paused and said, “Better check it with a meter.” The meter revealed that one phase of the circuit breaker had failed “live,” leaving the outlet energized. For these workers, this near-death experience is permanently imprinted in their minds in vivid detail they won’t soon forget.

Hazardous voltage left unchecked can result in loss of limbs, severe burns

and even death. The aforementioned incident had a much better result: Only hearts and minds were changed. It can be difficult to change lifelong opinions about safety, but when it happens, it's like an epiphany.

Accidents, near-death experiences and regulations compel us to find ways to improve safety. Here is an example of how one paper mill used voltage indicators (VIs) to enhance its safety procedures.

## Determine Voltage

Electrical safety asks one question: Voltage or no voltage? Electricians ask this question many times a day, and they rely on a voltmeter to provide the correct answer. There is no room for error. However, wiring a VI to the primary power source provides an independent answer to the critical voltage question.

This push button-sized device acts as a permanently wired voltmeter that provides electricians with a full-time, visual, independent, thru-door power indication. From a safety viewpoint, voltmeters serve multiple purposes, whereas a VI has a single purpose: to indicate the presence of hazardous voltage.

In the past, this particular mill used neon pilot lights installed on electrical mains that performed a similar function. On the downside, this simple voltage indicator still required fuses and replacement bulbs. After seeing the safety benefits of thru-door voltage indicators, this paper mill built a neon-indicating light assembly with access holes that electricians used to verify zero energy after opening the disconnect. They installed these on 208V lighting panels between hot/neutral.

The paper mill electricians benefited from the safety value of their homegrown, thru-door voltage indicator. Looking to improve reliability, they found a single 30mm push button-sized VI that overcame the limita-



Voltmeters are the guardians that keep maintenance workers safe from dangerous voltage.

tions of the neon pilot light assembly. This 3-phase device operates at 40-750 VAC/30-1000 VDC, requires no fuses, uses long-life LEDs, redundant circuitry and potted construction for high reliability. It was low-cost and very easy to install.

The maintenance manager nicknamed this device the “24/7 voltmeter” and began installing a few units in those high-maintenance areas of the plant. As the days passed, the maintenance staff started installing them throughout the plant and saw these safety benefits.

More stringent safety requirements required this mill to add a voltage verification step to its LOTO mechanical procedure. Simply put, mechanics would need to have an electrician verify a zero-voltage state on the load side of the circuit breaker disconnects before performing equipment maintenance, which affected the already high costs of the paper mill's scheduled shutdowns. The solution was to use a thru-door VI as a substitute electrician for this zero-voltage checking step.

## Thru-Door Electrical Isolation

The term “pre-verification of electrical isolation” presupposes that once an electrician opens the electrical en-

closure, he then performs the isolation verification procedure as per NFPA 70e Annex G 6.5 to 6.7 to verify electrical isolation with a voltmeter. This is a part of understanding that arc flash is the foundation for our electrical safety culture. During an electrical fault, if energy flows too long before the short-circuit device opens, it will vaporize copper to 5,000°F and cause a molten copper shrapnel explosion.

Arc flash sends 10 people a day to the hospital. The causes include dropping tools on live conductors, racking out MCC buckets or circuit breakers, and voltage checking, which is a slip of the hand that puts an electrician's face very close to this potential arc flash. Most arc flashes are not anyone's fault, but rather are the result of an equipment failure precipitated by an electrician who is just trying to do his job.

Most voltage-checking arc flash incidents center on the reliable operation of the isolator. Operating the isolator and seeing a real voltage feedback from a VI provides a secondary indication that the electrical energy has been pre-verified as isolated. Therefore, a voltage indicator applied in this application will reduce arc flash risk because a failed isolator would be discovered while the panel door is closed.

## Voltage Indicator

A voltage indicator, like any safety product, must have a written procedure that ensures its safe and consistent application. The first step in applying a VI requires the electrician to verify its proper operation. Are the LEDs flashing correctly for the power system? After opening the isolator, visually inspect the VI to verify that all the LEDs cease to flash. Once power is reapplied, make sure to re-verify proper operation of the VI.

In an eight-step LOTO procedure, the electrician's voltmeter stays in his

tool belt until step 6.5, according to NFPA 70e, 2004 Annex G. Think about the safety benefits when voltage information is provided to the electrician before, after and during the entire LOTO procedure. This discussion is not complete without mentioning the first law of electrical safety: Validate your voltage tester before working directly on electrical conductors. The "Live-Dead-Live" procedure is:

1. Verify instrument to a known voltage source.
2. Check system voltage.
3. Re-verify instrument to known source.

In other words, test the tester, test for zero voltage, and then test the tester again (nicknamed the live-dead-live procedure). The test the tester principle applies to any device, whether it is a \$6.95 outlet tester or high-end multi-

## Understanding arc flash is the foundation for our electrical safety culture.

meter. To fully validate a VI with the live-dead-live procedure, the 3-phase power must be reapplied to the device. In most cases, this is impractical. Therefore, voltmeters and VIs are on the same electrical safety team, yet both provide unique safety functions.

Instantaneous and invisible electrical energy poses a unique threat to maintenance workers. Electricity accidents kill 5 percent of victims. The time-tested voltmeter is the guardian that comes between maintenance workers and voltage. The voltmeter and voltage indicator are on the same team when it comes to safety benefits; however, would this near-death experience have happened if a 24/7 voltmeter had been installed?

*Rockwell Automation Encompass™ Partner Grace Engineered Products, Inc., based in Davenport, Iowa, manufactures cable interfaces and voltage awareness indicators.*  
Grace Engineered Products, Inc.

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# MOVE FORWARD WITH ROBOT INTEGRATION

Improve efficiency by integrating a SCARA robot with ControlLogix.

By Kevin Biffert, AFAST Robotics

➤ A Selectively Compliant Articulated Robot Arm (SCARA) is a four-axis robot with movement in the X, Y, Z and theta Z space. SCARA robots are used in a variety of applications that require flexible, high-speed and precise automation. Typical applications include assembly, material-handling, and pick and place.

The AFAST Integral series of robots from Rockwell Automation® Encompass™ Partner AFAST Robotics offers a line of SCARA robots that have been designed for easy integration with the Rockwell Automation ControlLogix® controller. These robots include Rockwell Automation Allen-Bradley® Kinetix gear motors and cables for direct connection to Allen-Bradley Kinetix® 2000 or Kinetix 6000 servo drives

Unlike traditional robot solutions that require a dedicated robot controller in addition to the cell line controller, the AFAST robot is controlled directly by the ControlLogix line controller. This results in lower system cost, higher performance and reduced commissioning time by eliminating the need for multiple controllers and the associated complex networking and synchronization logic. Complete programming and configuration is



Rockwell Automation Encompass Partner AFAST Robotics' SCARA robots include one cable that contains four encoder cables and four power cables at optional lengths.

provided by RSLogix™ 5000, using the extensive set of commands and powerful kinematics functionality. A single program can provide complete line and robot control. Users can also take advantage of vision system integration and advanced safety support.

Since AFAST robots use standard, multi-turn, absolute Allen-Bradley motors and drives, the servo setup for the robot axes is completed exactly the same way as for any other axes on the overall system. The servo motor catalog numbers, as well as the conversion ratio for each of the axes, are included in the instruction manual that comes with the robot. AFAST also provides a

tutorial program with the robot to give the OEM or integrator some quick starting points for easier integration of the overall system.

Once the user adds the robot to the configuration, the programming method is open to the integrator or OEM. The AFAST tutorial coordinate system method works well for any point-to-point movement. Camming functions also can be used to directly control the path of the robot through the entire cycle.

Efficiency is improved by using one control scheme for the overall system's control development, which allows you to shorten the programming and development time. Standard Allen-Bradley motors and drives greatly reduce downtime and inventories due to commonality of the motors and drives. □

*Rockwell Automation Encompass Partner AFAST Robotics, based in Fargo, N.D., offers open-source robotics designed to be controlled by Allen-Bradley PLCs.*

**AFAST Robotics**

[www.rockwellautomation.com/go/p-afast](http://www.rockwellautomation.com/go/p-afast)

**Rockwell Automation Encompass Partner Program**

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## >> Wireless Ethernet Modem

Rockwell Automation Encompass™ Partner Data-Linc Group has added its SRM7210E modem to the

compatibility list for LincView OPC, an RF network diagnostic software tool. This addition is a long-range, high-speed 900 MHz radio modem with throughput speeds of up to 800 Kbps and a range of more than 20 miles.

LincView OPC diagnostic software allows real-time monitoring of RF information in an SRM radio network. It can incorporate the information directly into an HMI application via the OPC technology, giving the SCADA system operator the ability to view radio performance information such as received and transmitted signal levels, RF noise, radio temperature and other data needed to evaluate and/or diagnose system performance.

Using Wideband Frequency Hopping technology, the SRM7210E provides data rates that are up to six times faster than standard Frequency Hopping technology, according to the company. It offers all of the features shared by the other SRM Family of radio modems, providing solutions for a range of network topologies from a simple point-to-point network to complex multipoint networks with virtually an unlimited number of repeaters.

Data-Linc Group

[www.rockwellautomation.com/go/p-datalinc](http://www.rockwellautomation.com/go/p-datalinc)

## >> Automated Excel Reporting

Rockwell Automation Encompass™ Partner SyTech, Inc. offers XLReporter Professional, a reporting solution for RSLinx®, RSView®, RSSql™, OPC, OLE-DB and ODBC. The process of collecting data, creating a report, analyzing its content and publishing it is fully automated.

XLReporter is designed to meet the demands of the process industry. Developed using Microsoft's automation technology, data is "pushed" into the report without Excel executing. XLReporter extends the standard list of Excel calculations to provide statistics, run times, event counts, integrals and more. DDE, relational database scripting and programming are not required, according to the company.

Reports are created periodically (shift-end and daily production reports) or on the occurrence of events (batch-end reports). XLReporter automatically sends completed reports to printers, publishes it to Web pages, saves it to PDFs or e-mails it to designated recipients.

SyTech

[www.rockwellautomation.com/go/p-sytech](http://www.rockwellautomation.com/go/p-sytech)



## >> Product Spotlight

### VersaView with Solid-State Technology

The Allen-Bradley® VersaView® 200R industrial computer from Rockwell Automation® maintains its 50°C rating and maximizes reliability with a new fanless design. The 200R is designed for applications that require low power consumption, ruggedness, small size and expandability, such as in oil and gas, food and mining applications.

The nondisplay, heavy industrial computer can run visual interface, maintenance and control applications.

Combining the 200R computer with a VersaView industrial monitor creates an integrated, compact way to view drawings, modify ladder logic and review manuals.

The 200R features up to 1 Gigabyte of RAM, four USB 2.0 ports, two 10/100M Ethernet ports, and is available in AC and DC versions. Mounting options include panel, DIN rail and the ability to vesa-mount on the back of a VersaView industrial monitor.

Comprised of a suite of scalable HMI software and a scalable family of operator interface hardware, Rockwell Automation visualization solutions provide plant-floor machine operators, supervisors, engineers and business managers with a window to data, and production and process information. These solutions are designed to increase productivity and reduce total cost of ownership by providing customers with solutions that can be quickly configured, enabling easier access to information.



Allen-Bradley VersaView 200R

[www.ab.com/go/pr200r](http://www.ab.com/go/pr200r)



## >> Multi-Scale Analog Communication

Rockwell Automation Encompass™ Partner Hardy Instruments introduces analog output communications for its HI 3030 Series of multi-scale weight controllers.

The -2AN option provides two independent outputs with a choice of gross, net, rate-of-change or mapped total weight as both current (0-20 or 4-20mA) or voltage (0-5 or 0-10 VDC). The HI 3030 can hold up to two cards, which provides four independent analog outputs. All parameters can be mapped, or assigned, to the analog outputs. Each analog output can be assigned to any of the instrument's four-scale channels.

Hardy Instruments

[www.rockwellautomation.com/go/p-hardy](http://www.rockwellautomation.com/go/p-hardy)

## >> Product Spotlight

### AC Drives for Flexible VFD Control

Allen-Bradley® PowerFlex® 4M AC drives from Rockwell Automation® give users easy-to-program, variable-frequency motor control with feed-through wiring for quick installation. The drive helps users minimize mechanical machine stress and increase application flexibility.

With power ratings from 0.2 to 11kW (0.25 hp to 15 hp) and voltage classes of 120, 240 and 480V, the PowerFlex 4M AC drive is the smallest member of the PowerFlex family of drives. Its A Frame measures 174 mm (6.85") H x 72 mm (2.83") W x 136 mm (5.35") D; the B Frame measures 174 mm (6.85") H x 100 mm (3.94") W x 136 mm (5.35") D; and the C Frame measures 260 mm (10.24") H x 130 mm (5.12") W x 180 mm (7.09") D. All frame sizes feature Zero-Stacking™, which saves panel space by eliminating space between drives in applications with ambient temperatures up to 40°C.

For ease of installation, the PowerFlex 4M A- and B-Frame drives are designed with DIN-rail, snap-in mounting features. For ease of information sharing and setup, integral RS485 communications enable engineers to use the drives in a multidrop network configuration, and a serial converter module connects to any controller that has the ability to initiate DF1 messaging.

Featuring the popular CopyCat function, a NEMA/UL Type 4X remote and NEMA/UL Type 1 handheld LCD keypad provide additional programming and control flexibility.

Users can program, monitor and control the PowerFlex 4M drives with DriveExplorer™ and DriveTools™ SP software.

Allen-Bradley PowerFlex® 4M AC drives  
[www.ab.com/go/powerflex4m](http://www.ab.com/go/powerflex4m)



## » Premier Integration Drive Configuration

Rockwell Automation introduces Premier Integration, an integrated drive configuration feature in RSLogix™ 5000 v.16 software that allows Allen-Bradley® PowerFlex® drive users to consolidate drive system configuration, operation and maintenance into a single, integrated environment. This capability helps reduce programming, installation and overall ownership costs by minimizing the number of software tools required.

Premier Integration offers faster start-up, improved accuracy and easier drive system maintenance. Integrated drive configuration allows users to configure both controller and drive network connections from a single location, which minimizes the potential for errors when defining the Ethernet/IP or ControlNet network I/O. This feature also eliminates the need to individually program required parameters and tags. Users no longer have to complete complicated programming functions when installing PowerFlex drives or constantly refer to user manuals for specific parameter and tag information.

To ease maintenance and improve access to information, drive configuration data is saved as part of the RSLogix project file and also stored in the Logix controller. There is no need to store and maintain multiple files — users only need one file for both the controller and all drive configurations.

Premier Integration for RSLogix 5000 v.16  
[www.rockwellautomation.com/go/profilepr](http://www.rockwellautomation.com/go/profilepr)



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## >> Product Spotlight

### Temperature/Process Controllers



Allen-Bradley® Bulletin 900-TC16 and 900-TC8 Single-Loop process controllers from Rockwell Automation® combine thermocouple and RTD sensing capability with either on/off or analog outputs into a global temperature controller. This feature allows one unit to satisfy all temperature applications. Also available are 900-TC16 and 900-TC8 controllers with analog input and on/off or analog output capability.

Auto-tuning PID control technology with analog outputs increases system efficiency while smoothly managing the process. This results in decreased temperature swings, more stable workload temperatures, improved control efficiency, increased component life and more economic energy consumption. The PID's auto tuning feature makes it possible for novice users to start up temperature heating and cooling applications.

For typical controller parameter configuration, the 900-TC16 and 900-TC8 feature four sealed, tactile-feedback keys and an energy-efficient 11-segment LED display, which translates complex parameters into a more understandable display. The keypad and display also allow users to switch from manual to automatic control without system disruption.

Bulletin 900 Temperature/Process Controllers  
[www.ab.com/go/900slpc](http://www.ab.com/go/900slpc)

## Fiber Optic Communications from Phoenix Digital

MODEMS – CABLE – ACCESSORIES – SERVICE – SUPPORT

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DIN Rail



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- Intrinsic safety ... noise immunity
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- Would You Like to Reduce Electrical Noise?
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BLOCK is a global manufacturer of magnetics specializing in EMI/RFI Power Filters, Harmonic Mitigation Filters and Output Filters for variable frequency drives. Benefits include improved system performance, energy savings and reduced machinery downtimes.



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## » Mechanical Interlocks for Switched Enclosures

Rockwell Automation Encompass™ Partner Hubbell Wiring Device-Kellems has added unfused 20 Amp Pin & Sleeve Mechanical Interlocks to its Circuit-Lock family of switched enclosures.

The mechanical interlocks incorporate the disconnect switch/manual motor controller and receptacle in one compact, nonmetallic unit. Each Circuit-Lock motor controller is listed as Suitable as Motor Disconnect to comply with NEC controller and disconnect requirements. Positioned between the load center and the motor, the combination switch allows the user to terminate circuit power at the motor for servicing without shutting down the entire line.



Circuit-Lock eliminates the possibility of connection or disconnection of the plug under load, or making a casual, or lazy, connection. The switch cannot be turned on until the plug has been inserted properly, and the plug cannot be removed until the switch is turned off. The unit is easy to install and provides a method for lockout in compliance with OSHA lockout/tagout regulations. It is compatible with IEC 60309-2 plugs.

Hubbell Wiring Device-Kellems  
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## MAINTENANCE PROGRAM INCREASES PROFITS

By Luke Peters, Services Branch Leader, Rockwell Automation

➤➤ Faced with global competition, higher energy prices and significant price increases in raw materials, many paper manufacturers are looking for ways to maintain margins and their competitive edge. Rockwell Automation® Services & Support partnered with one U.S. paper mill to meet these challenges.

**Challenge:** The paper mill wanted to increase plant production, capacity and uptime without increasing its operations and maintenance staff.

### ➤➤ Help When You Need It

The Rockwell Automation Services & Support portfolio provides the skills and resources to help you optimize the performance and utilization of your automation equipment to meet your business goals. Services & Support includes:

- Assessment Services
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- Safety, Network & Security Services
- Training Services

For additional information about Rockwell Automation Services & Support, go to [www.rockwellautomation.com/go/journ807](http://www.rockwellautomation.com/go/journ807).

Numerous factors hindered their ability to make these improvements:

- Implementation of a production line upgrade project.
- An unscheduled downtime rate of 1.8 percent at an estimated cost of \$38,500 per hour.
- A fully utilized operations and maintenance staff, and the inability to hire any additional full-time employees.

**Solution:** Rockwell Automation designed and implemented a custom maintenance program that included a strategic combination of services to meet the mill's objectives. This included preventive maintenance, equipment trending and performance verification, and documentation management.

The paper mill also used Rockwell Automation engineers to augment their staff during planned outages and emergency downtime events. This freed the maintenance staff to focus on the production line upgrades.

Also, Rockwell Automation engineers provided on-the-job training to the plant electricians. This improved the mill's ability to troubleshoot problems in-house, reducing mean time to repair and increasing the maintenance team's value to the organization.

Increasing the skills of the maintenance staff not only helped reduce



A U.S. paper mill experienced \$6.75 million in downtime savings after implementing a custom maintenance program.

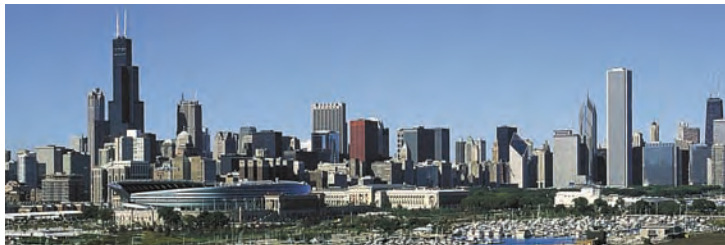
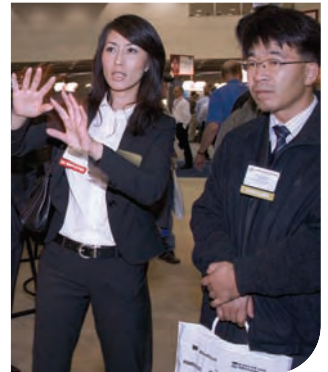
downtime, but also allowed Rockwell Automation engineers to perform root cause analysis on recently failed machines — further reducing downtime.

**Results:** In the first year of the maintenance program, the mill increased plant uptime from 98.2 percent to 98.7 percent. This produced \$6.75 million in downtime savings.

By applying a strategic approach to maintenance — determining in advance where it's appropriate to predict, prevent and react to unplanned downtime — you can make maintenance a business asset, rather than a necessary expense. □

For more information on how to apply a strategic approach to maintenance, visit [www.rockwellautomation.com/go/journ807](http://www.rockwellautomation.com/go/journ807).

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