RF IDEAS
Solutions for Identification and Access

WHITE PAPER

Access Control Enters the Realm of Industrial Automation

Implications and opportunities of evolving authentication needs and smart technologies

State of the Industry

Physical and logical security in manufacturing plants and industrial complexes is a pressing and persistent concern. Controlling access to and within the site and protecting information and automation systems from breaches is a business essential. Physical or digital security lapses, whether accidental or malicious, can cause significant and lasting damage, particularly when it harms personnel, the equipment or environment, or impacts the quality process.

Now there are building automation systems that control a facility's climate, lighting and similar systems, and equipment automation systems that control machines and processes. They are often driven by programmable automation controllers (PACs) and use a human-machine interface (HMI) for configuration, notifications and routine control. With these systems growing in number and increasingly interconnected, programmable controller and HMI access control becomes an imperative.

As a result of these trends, everyone is a stakeholder when it comes to access management, from the facility and security managers to the personnel in operations, maintenance, engineering, inventory, purchasing, training, IT and the corporate suite. Different levels of protection, identification, and authentication are needed, depending on the HMI and application. It's really about anything that requires control.

Modernizing and layering legacy access control methods, such as the ubiquitous employee badge, is a sound and economical approach to protecting production processes, data, and critical assets throughout the organization. Considering that nearly everyone entering a locked facility has to present a security badge of some sort to gain entry, why not apply this same concept — and smart technology — to logical security concerns inside the building?

This white paper is part of a leadership series which explores the latest advancements in smart technologies in industrial access control, including the vital methodologies and solutions that are critical in addressing today's evolving access control needs.

Part 1, "New Developments in Industrial Access Control and Identification," includes discussions of new trends in access control that are changing the role that access authority plays throughout the organization. It also highlights the ways in which employee badge solutions are streamlining access control processes, improving risk management and creating significant savings for today's organizations.

Part 2, "Key Considerations in Choosing the Right Industrial Access Control Solution," provides a practical guide for evaluating the four most prominent access control methodologies in use today, including discussions of the advantages and disadvantages of each methodology. The paper concludes with an introduction to RFID access control badges and readers and their applications in today's enterprise organizations.

Part 1 of the RF IDeas Leadership Series

THIS WHITE PAPER EXPLORES:

- The effect of information and operations technology convergence on the manufacturing and processing industries
- How new automated systems are creating smart factories
- Potential savings from smart card deployments
- Applications of badge-based reader solutions throughout the enterprise

What's New in Industrial Access Control?

Employee badges (ID cards) are a commonly used credential to gain access to a facility, just as usernames and passwords are used to access software applications. With the cloud and big data accelerating the convergence of information technology (IT) and operations technology (OT), more refined security and risk management opportunities are available.

"We believe the growing IT/OT convergence is having a significant effect in the manufacturing and processing industries," says Craig Resnick, vice president of consulting at ARC Advisory Group. The two groups began working together over the past 5 to 10 years, and although companies today are at all different levels of convergence, Resnick believes the direction towards greater convergence is clear.

"When the IT/OT convergence is done, many times a company will utilize IT's security access and practices and try to apply that to control systems access, whether that's passwords or multi-level passwords, all the way up to iris scans depending on the level of security desired," explains Resnick.

Manufacturing is on the brink of a massive change as new connected, automated systems are now making their way onto the factory floor, serving as the foundation for creating smart factories, according to a report from research firm MarketsandMarkets published in September 2015. The Industrial Control and Factory Automation Market is expected to reach US$202.42 billion by 2020 at a CAGR of 6.73% from 2015 to 2020, the report says.

New badge-based readers coupled with partner applications are standardizing and streamlining manufacturing access control processes. The same employee badge used to enter a building can now also be used to authenticate access to equipment, factory lines, gated robotic rooms, documents and software, and to regulate activity on control systems, networks, and equipment. Virtually any movement within the facility and any activity throughout the day could potentially be tracked and managed with the right badge reader, apps and a badge.

Badge-based authentication is not only faster, but it eliminates the errors associated with manual password entry, thus improving accuracy and ease of use. For instance, in situations where a supervisor periodically helps an operator, a badge-based access solution would prevent the operator from re-using the supervisor's username and password, avoiding intentional misuse or errors. The ability to leverage existing employee ID badges or key FOBs with readers provides a desirable and cost-effective solution.
There are a variety of badge (card) readers available depending on the badge type used by an organization. There are magnetic stripe badges, barcode badges, proximity cards (125 kHz) or the increasingly popular RF-enabled contactless smart cards (13.56 MHz). On the manufacturing floor, contactless smart cards are used more frequently because of the amount of information these card types contain.

> Everyone is a stakeholder when it comes to access management.

For organizations that may have acquired another business and find themselves with both proximity and contactless smart cards, there are dual-frequency USB readers which are easily configured to read more than one card type. This ability to leverage the existing badge investment and avoid re-training, and gain process efficiencies from access control standardization, enables substantial cost savings that directly benefit the bottom line.

Based on a study of enterprises published in 2004, Datamonitor found that by deploying an integrated smart card security solution for both data (logical) and physical access, an enterprise may annually save more than $2 million for every 2,000 employees covered by such a combined identity and access management system. In today's dollars, that equates to roughly $2.5 million. Cost savings are attributed to factors such as:

- Reduced time spent on sign-on procedures
- Consolidation of employee access privileges onto a single, multi-functional smart card
- Improved quality control with access permissions
- Reduced numbers of password-related queries made to IT departments
- Better management of PKI certificates
- Greater automation of card provisioning

But the cost benefits extend well beyond access efficiency. After a large paint manufacturer installed a badge reader on its mixers to ensure that only authorized, trained employees could unlock and operate the equipment, the number of bad batches fell from 12 per week to less than one per week, saving the company nearly $2.5 million annually.

> Requiring employees to use their badge throughout the work day improves work management and accounting of people and projects.

The proven value of this technology is driving increasing investments. "The American [North and South America] market for electronic access control readers was worth about $237 million in 2015 and is projected to grow to $252 million in 2016," says Blake Kozak, principal analyst for the Security & Building Technologies group at IHS Technology. IHS defines readers to include magnetic stripe, smart card readers, proximity readers, biometric readers and multi-technology readers.

"Smart card readers are projected to grow the fastest in 2016 at 8.8% in the American [North and South America] market," adds Kozak.

Applications are Varied and Growing

Growing interconnectedness and the ability to standardize access control are revealing opportunities for risk management that were not previously viable. Both physical and logical access controls are an essential part of a complete security policy. And increasingly, access controls are becoming an important element of quality control policies.

As the following examples indicate, security procedures and applications can be found throughout the plant to manage access, manage access levels by user role, and track employee actions. Indeed, the possibilities of solutions such as smart cards used with badge readers are limited only by the extent of one's imagination.

> RFID badge-based solutions offer enhanced security, and with contactless smart cards, more information

Information Technology

- Information systems and networks are vulnerable to hacking, malicious software, and lost or stolen devices. At the most basic level, IT needs to ensure that computer logins are the first step to protecting information. However, passwords can be forgotten, which consumes employee and help desk time. Switching from passwords to badge-based authentication eliminates the manual keystrokes and associated problems. Leveraging two-factor authentication, such as a password and badge, further increases the level of security.

Operations

- Putting a badge reader on PAC-based machine control software can prevent remote software updates and require the physical presence of the personnel authorized to make software changes. The use of an employee ID badge as an authentication device prior to allowing software updates may reduce the likelihood of a malicious computer event like the Stuxnet worm that hijacked nuclear power plant motor control in Iran.

- Readers programmed to communicate with PAC or HMI operator interface software ensure that only authorized users can log in to the computer and use the software. This limits who can run the production line, how it works, and who can make changes such as to parts, ingredients, or product colors.

- Requiring badge authentication at a production line allows tracking of who is on the line and when, so that quality issues or other problems can be traced back to the individual, and retraining or other corrective actions can occur.

- Badge readers used for access control purposes can be used for start-up control of forklifts or other material handling equipment, ensuring that only trained or certified employees can start them. It is important for OSHA safety purposes to ensure forklift operator identification, access control and monitoring, as this information is very helpful should an accident occur.

Maintenance

- When hazardous equipment such as a large press is due for maintenance, requiring badge authentication before allowing safety features to be disabled can ensure that only properly credentialed employees are exposed to this risk.

- For specialized equipment, access control applications tied to employee training records can be used to ensure the maintenance technician's certification has not expired, otherwise the machine will not turn on.

Item Dispensing

- Industrial vending machines with badge readers can control who accesses the machines, track which items are dispensed, and account for the costs. It provides the ability to monitor consumption trends, ensuring the appropriate quantities are reordered at the right time to keep carrying costs low. It also provides a means to troubleshoot excessive withdrawals and reduce costs due to loss prevention, for instance if safety gloves are inadequate for a task and replaced often, or an employee is taking gloves home.

- Tool access controls can be established so that an employee only has access to those tools specified for a job, helping to avoid defects or delays caused by incorrect tools. With the proper application, a badge-based reader solution can dispense the right tools to the appropriate person for their specific task. The application could also be designed to associate the items to a project or work order, and validate whether the expected types of items are taken.

Training

- Taking training class attendance is easier and more accurate when employees use their badges to sign in and out, rather than using a sign-in sheet. Poor handwriting and forgetting to sign in reduce the efficacy of attendance tracking. Leveraging the employee badge helps ensure training completion, which increases productivity and reduces defects. It also facilitates OSHA training requirements by automating the tracking and validation of class attendance, training dates, and other pertinent information.

- When processes or equipment change, badge authentication can be used to ensure employees have completed the necessary training. For example, when the badge is presented to the computer software, a message can pop up informing the employee of the need to complete training on the new process.

Compliance

- In regulated industries such as food processing or nuclear power, compliance and compliance reporting are essential. Access control and tracking applications can validate whether employees have the authentication to perform their assigned duties, whether it's reading a file, running a program, or operating a machine. They can also help to capture the necessary regulatory records.

- The use of the badge for chain of custody documentation requirements ensures that only authorized personnel can obtain and print physical or electronic evidence.

- In industries like food processing and pharmaceuticals, federal inspectors have audit rights to check who is handling various activities on a production line. The addition of a presence detection device with a badge-based solution will give the auditors confidence that an operator's HMI is not accessible in the event it is left unattended. When the operator steps away, the presence detection device's sensors will close the screen until the operator badges back in.

Purchasing

- Securing purchasing files protects against credit card and identity theft. Requiring badge access to the computer software ensures that only authorized personnel can access and manipulate personal or financial information.

Corporate

- Requiring employees to use their work badge throughout the work day improves work management and accounting of people and projects. Using a backend data management system and a badge, the actual time and expenses spent on a task can be easily tracked and billed, and resource assignments can be more effective due to improved personnel and skills visibility.

- Secure printing is needed to ensure that document privacy issues are avoided. Badge authentication at the printer prevents print jobs from printing until the requestor is in the presence of the printer. In addition, printing costs are reduced because it compels employees to become more selective in what they print, and because print functions can be limited to specified work functions.

- Badge-based cashless cafeteria applications link the employee's record to a financial account, allowing them to move much faster through the sale.

- Mergers and acquisitions combine companies with different security practices and technologies. Using a badge reader that reads virtually any badge type avoids the expense of replacing badges, simplifies the transition, and improves efficiency for better operational workflow.

Conclusion

New solutions leveraging employee badges, readers and application software offer combined identity and access management capabilities for a wide range of applications at today's industrial enterprise organizations. From providing enhanced security on the production line to authentication of training completion, they play an important role in improving risk management and operational efficiencies. Their proven value is creating significant growth in the market for electronic access control readers.

RF IDEAS LEADERSHIP SERIES

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TO LEARN MORE ABOUT HOW RF IDEAS CAN HELP YOUR ORGANIZATION ENHANCE SECURITY AND OPERATIONAL EFFICIENCIES BY AUTOMATING ACCESS CONTROL, VISIT WWW.RFIDEAS.COM

ABOUT RF IDEAS

RF IDeas, Inc., www.rfideas.com, is a leader in the employee badge and card reader space for manufacturing, healthcare, government and enterprise. Partnering with leading technology companies, RF IDeas readers enable innovative solutions for single sign-on, secure printing, attendance tracking, and other applications that require authentication. RF IDeas is a subsidiary of Roper Technologies. For more information about RF IDeas products and applications, visit the Knowledge Center at https://www.rfideas.com/knowledge-center.

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