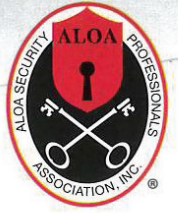


KEYNOTES

SECURING YOUR SUCCESS



MISUNDERSTOOD HARDWARE: AUTOMATIC DOORS

Take a look at the overlooked complexity
behind a familiar convenience

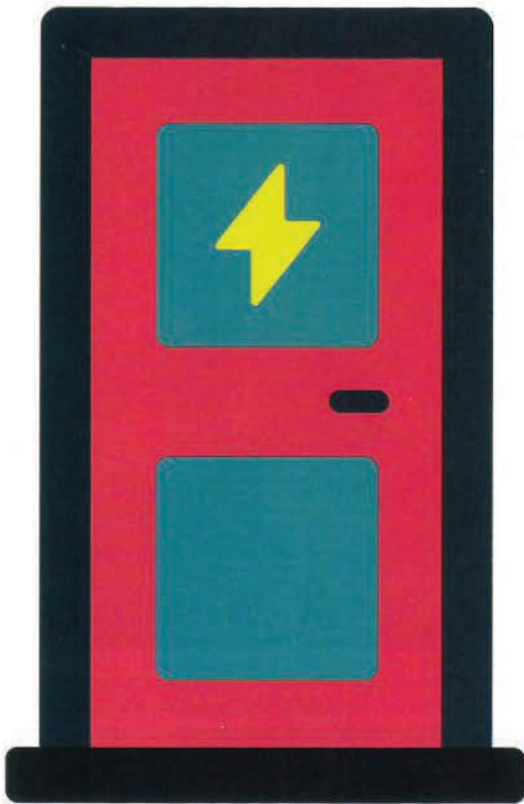
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Security Door Controls
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RETROFITTING DOORS FOR ELECTRONIC ACCESS CONTROL

In the second installment in this series, **Kerby Lecka** discusses implementation.

PART I OF THIS SERIES TOOK us through the essential steps for electronic access control (EAC) retrofits leading up to the selection of locking hardware. In Part II, we review how to execute a successful and compliant retrofit implementation.

Identify the Power and Door Control Solution Hardware and Door Control Modules

Many manufacturers offer hardware and door control modules (see *Figure 1*) designed to manage separate electrified locking devices, multiple doors, and relay operating or system modes for lock control, monitoring, and communication of door and lock system logic. These modules are typically installed in the power supply cabinet, providing a centralized wiring

location that simplifies installation and troubleshooting.

Power Transfer Devices

Supplying power to EAC components requires power transfer devices, such as power transfer loops and concealed power transfer hinges (*Figure 2*). These devices ensure that electrical connections are maintained between the door and frame, even as the door moves.

Power Supply Considerations

Selecting the appropriate power supply (*Figure 3*) is critical. Power requirements for EAC hardware differ from other systems (such as CCTV), as access control systems require steady low-voltage DC and may draw higher current during events like electric strike releases.

Before selecting a power supply, evaluate the following:

- What power is required, and what power is available (especially in retrofit situations)?
- Have any modifications over the years affected the capacity of the power supply?
- How old is the power supply? (Replace if over 10 years.)
- Are all products compatible and able to work together?
- What regional and national codes apply to the installation?
- Does the authority having jurisdiction (AHJ) require compliance with UL 294, the access control standard? Involve the AHJ early in the design process.
- How long must the system operate after a power loss?
- Is a low-voltage license required in your jurisdiction?

Careful planning and adherence to these considerations will help ensure a reliable, code-compliant EAC installation.

PoE: Bridging Doors and Networks

So far, our discussion has focused on retrofitting or upgrading door openings for electronic access control (EAC) without considering integration with PC-operated access control systems or facility networks. While some professionals may have experience integrating door openings with enterprise access control networks, others may feel less confident about network integration due to potential software and hardware conflicts, incorrect settings or liability for IT issues.

Options for Non-IT Experts

You do not need to be an IT or software expert to successfully integrate door openings into an access control network. Consider expanding your skills through classes. Contact ALOA Education to learn about current offerings at conventions or elsewhere, and there are also online training courses offered by the Electronic Security Association (<https://esaweb.org>), SecurityCEU.com and manufacturers.

Power over Ethernet (PoE) Solutions

One practical alternative is to use Power over Ethernet (PoE) hardware and components. PoE allows you to connect door access devices to an IP-enabled controller using existing Ethernet cables, assuming the cable has at least a Cat 5e rating. Cat 6 or higher is preferred, reducing installation complexity and cost. These solutions can be managed via a web browser, eliminating the need for dedicated software and making setup straightforward.

Advantages of PoE Solutions:

- Simple installation using existing Ethernet infrastructure.
- Remote management via browser-based interfaces.

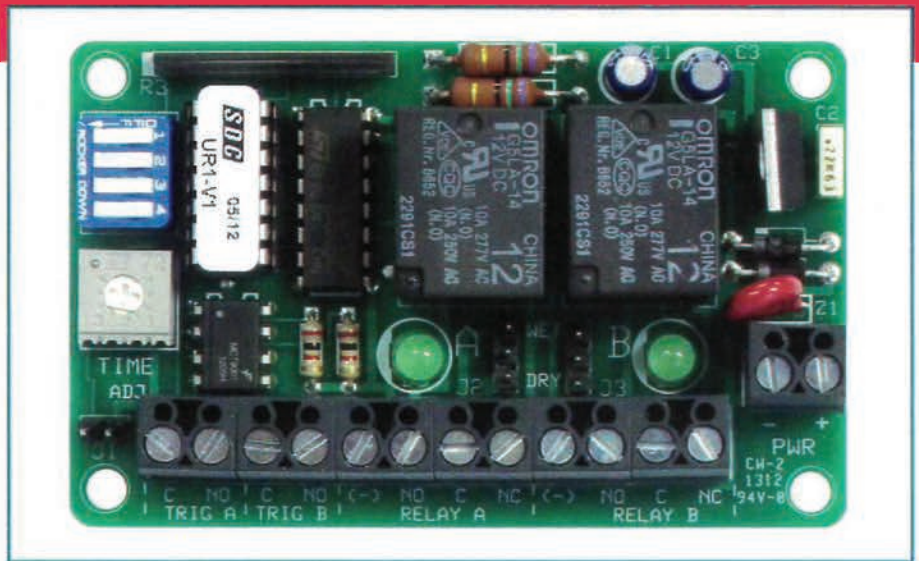


FIGURE 1. Door control modules are designed to manage separate electrified locking devices, multiple doors, and relay operating or system modes. All illustrations and product images courtesy of SDC.

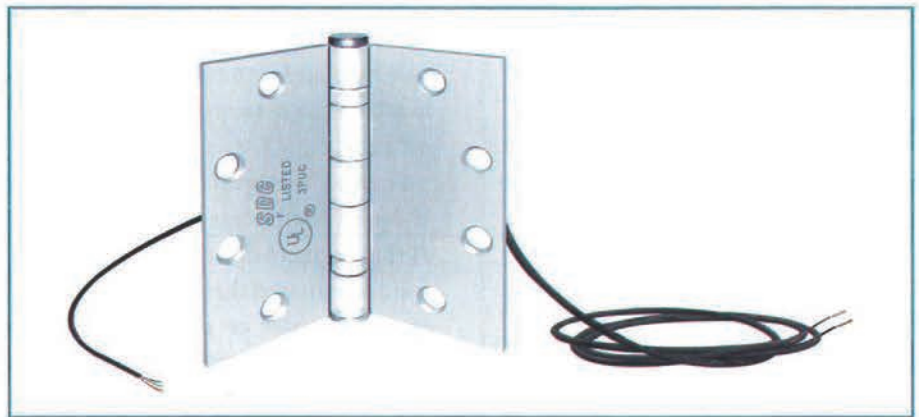


FIGURE 2. Supplying power to EAC components requires power transfer devices, such as this concealed power transfer hinge.

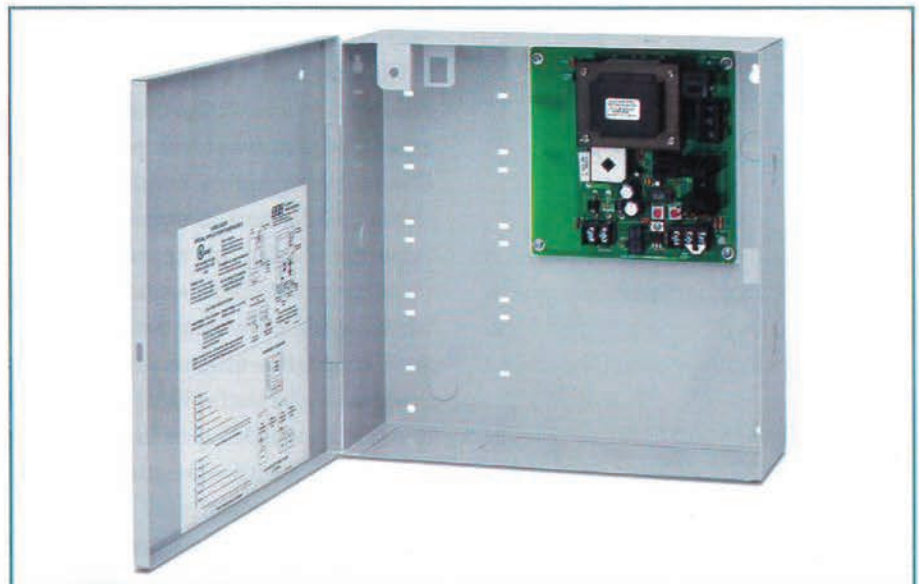


FIGURE 3. Selecting the appropriate power supply is critical.

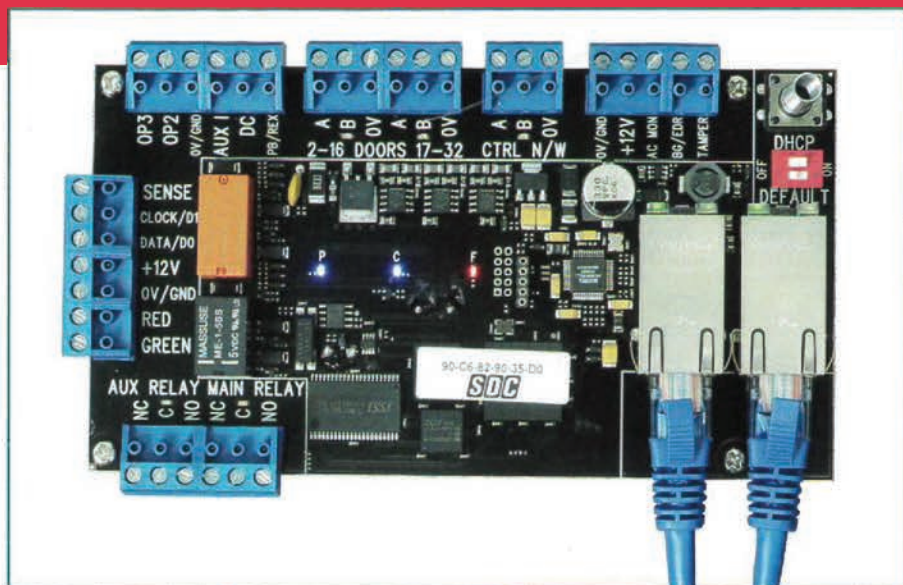


FIGURE 4. IP-based door access controllers connect directly to the network and are managed through a web browser on a computer or smartphone.

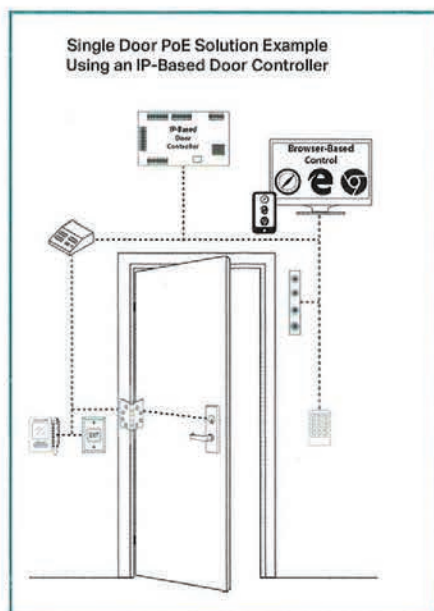


FIGURE 5. This illustration shows a typical PoE door control solution using an IP-based door control.

- Compatibility with a wide range of access control hardware (magnetic locks, exit switches, electrified locksets, automatic door operators, cabinet locks, etc.).
- Scalability for small facilities or single doors, with the option to expand as needed.

Many manufacturers offer PoE-compatible hardware, including magnetic locks, key and exit switches, electrified

exit devices, electrified locksets, electric bolt locks and automatic door operators to attach to a network system via Ethernet cable.

Several manufacturers also offer IP-based door access controllers (Figure 4) that connect directly to the network and are managed through a web browser on a computer or smartphone. This approach streamlines installation and minimizes the need for IT involvement, saving time and reducing potential complications. Figure 5 shows a typical PoE door control solution using an IP-based door control.

Physical electronic access control solutions that use low-voltage Power over Ethernet (PoE) hardware, components, and IP-based door controllers are especially well-suited for tenant improvement and retrofit projects. This approach allows organizations to purchase and install only what is needed, avoiding the higher costs and complexity of enterprise systems designed for larger facilities. These solutions are also easily expandable, enabling future growth without requiring a significant upfront investment.

Multi-door applications are supported by many manufacturers, with options, including:

- IP-based door controllers that are available in configurations for two, four, six or eight doors, supporting brand-specific access and egress hardware.
- Door controllers with optional expansion boards, allowing additional doors to be added and supporting a variety of hardware brands.
- Free, pre-installed software that provides the functionality of a full PC-based access control system, managed via a web browser on a desktop, tablet or smartphone.

This modular and scalable approach offers cost savings, flexibility and ease of installation, making it ideal for small- to medium-sized facilities or projects with evolving access control needs (Figure 6).

Surveying and Installing PoE-Based Access Control Systems

When planning an electronic access control (EAC) retrofit, begin by surveying the location of Ethernet cables and available electrical power. This assessment will help determine the type of installation required — whether for a single door or multiple doors.

Key Installation Considerations

- If using existing Ethernet cables, you may need to install a PoE (Power over Ethernet) splitter to provide power to your components.
- If additional power is required, consider installing a PoE injector to supplement the system.
- Ensure installers are familiar with Ethernet network best practices and test installations using an Ethernet cable tester before startup.
- Follow industry standards such as ANSI/TIA-1005-M.I.C.E and ANSI/TSI-569C.0 (cable lengths) to prevent issues from previous installations.

Multi-Door PoE Solution Example Using an IP-Based Door Controller + Expansion Module

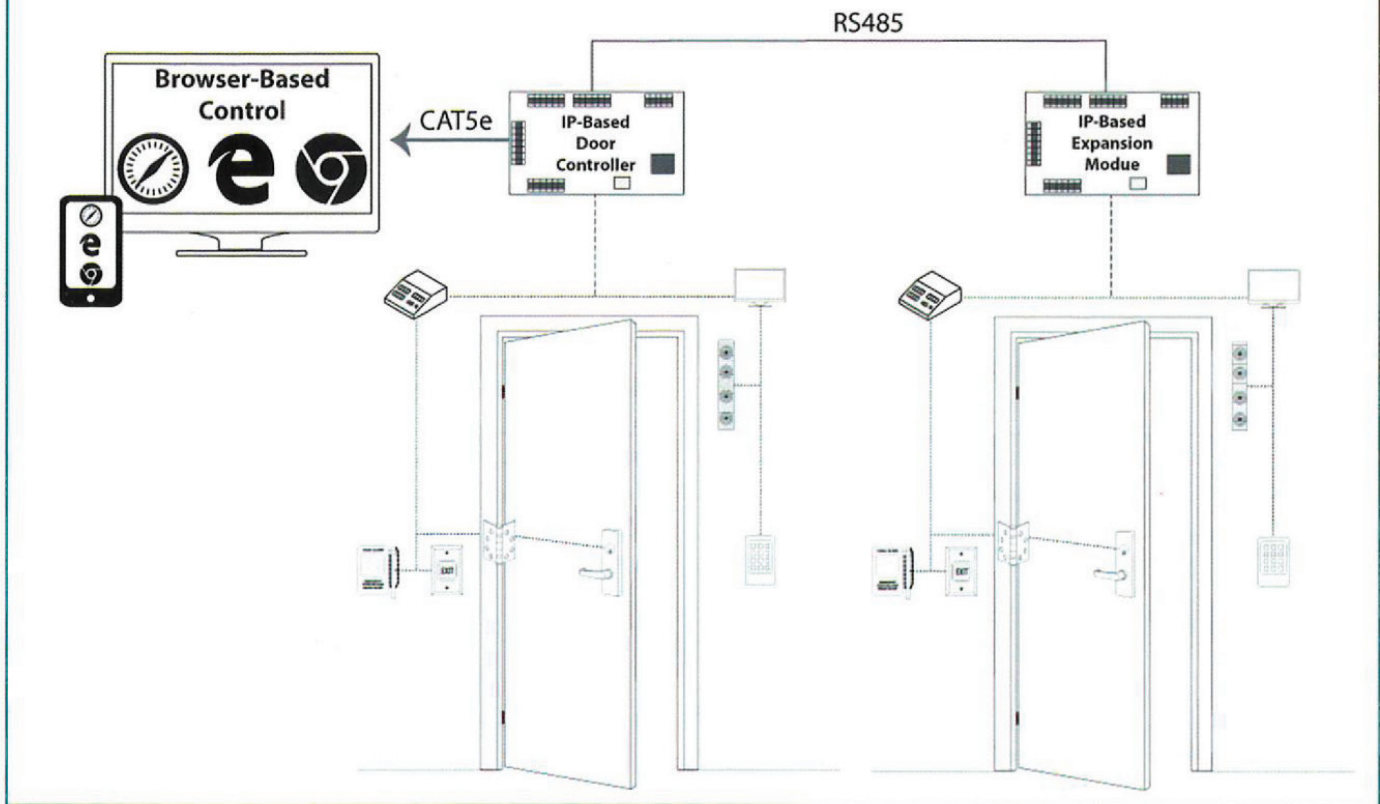


FIGURE 6. Shown is an example of a multi-door PoE using an IP-based controller and expansion module. This modular and scalable approach offers cost savings and flexibility.

Compliance and Safety

- All PoE access and egress solutions using IP-based door control must comply with fire and life safety codes, including the use of UL 294-approved hardware where required.

Advantages of PoE Solutions:

- Using existing Ethernet cables with PoE hardware and IP-based controllers can save time, reduce costs and minimize the need for IT expertise.
- These systems are scalable, allowing expansion from a single door to 100 or more doors, depending on the manufacturer's solution.
- PoE-capable locking hardware and IP-based controllers bridge the gap between traditional locking hardware and IT networks, enabling easy upgrades without requiring advanced IT skills.

Identify the Egress Control Solution

How Will Users Get Out?

Key switch assemblies (Figure 7) offer an economical solution for authorized access control in both new installations and retrofit projects. Most assemblies use U.S. standard 1" and 1½" mortise key cylinders and interchangeable core housings, ensuring compatibility with existing facility mechanical key systems.

Manufacturers also provide a range of exit control options, including:

- Exit buttons and push buttons: These are available in various styles and contact configurations to support different request-to-exit applications.
- Wave-to-open switches and motion sensors: These enable hands-free operation for touchless access, using proven infrared detection technology for enhanced convenience and hygiene.



FIGURE 7. Key switch assemblies can be an economical solution for authorized access control in both new installations and retrofit projects.



FIGURE 8. Wave-to-open switches and motion sensors allow hands-free operation for touchless access, using proven infrared detection technology.



FIGURE 9. Electrified exit devices allow for greater control of the opening and can interface with other electronic equipment. Shown is an electrified rim or vertical rod exit device.

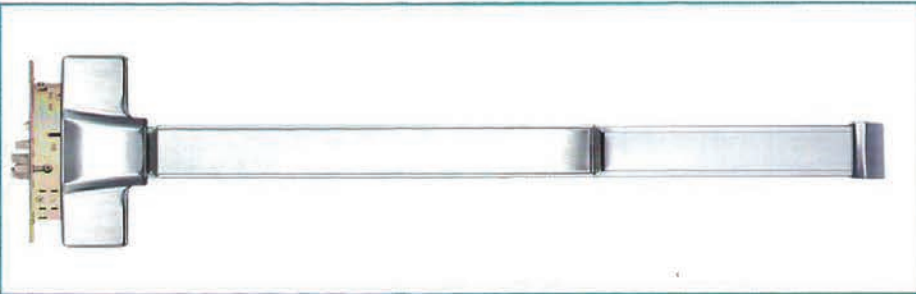


FIGURE 10. This is an electrified mortise exit device.

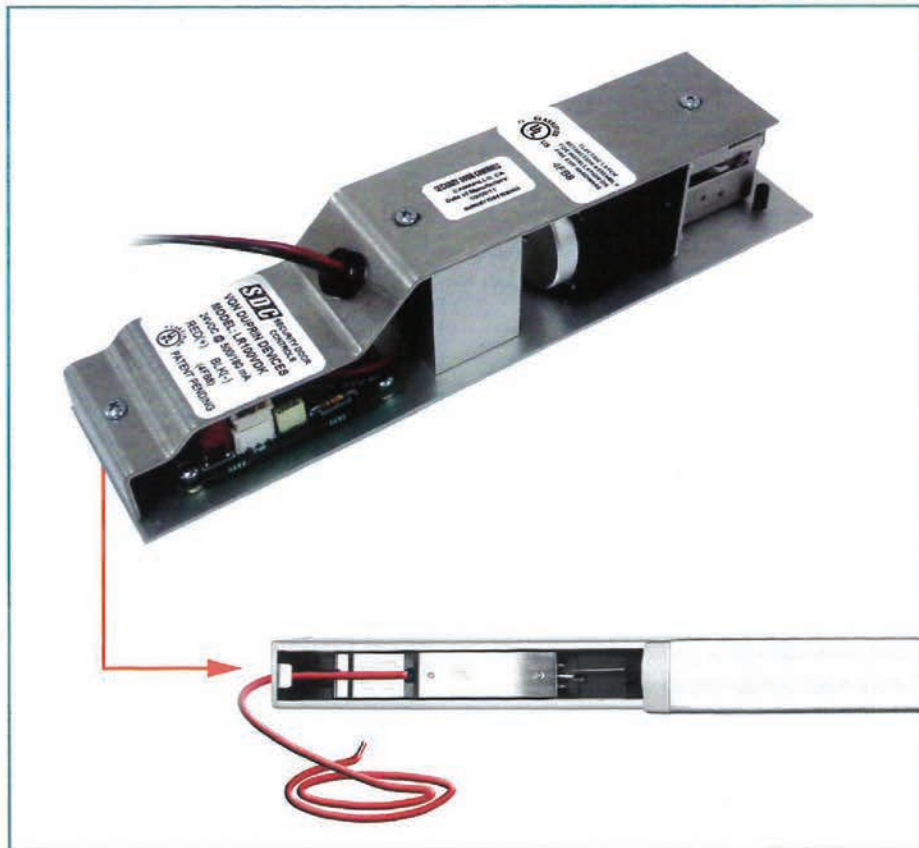


FIGURE 11. Electric latch retraction (ELR) field modification kits are a cost-effective solution for upgrading existing mechanical exit devices to electronic operation.

These solutions are designed to meet diverse facility needs, improve accessibility, and support modern health and safety standards.

Egress devices are designed to release magnetic locks and activate delayed egress locks on non-latching doors. Request-to-exit (REX) push bars enable immediate, intuitive egress through access-controlled openings with magnetic locks, eliminating the need for prior knowledge or secondary actions. REX push bars also remove the requirement for wall-mounted exit switches, streamlining exit procedures and enhancing safety and accessibility.

Exit devices are an essential hardware component found in almost every assembly and educational/K-12 occupancy for life safety and security. Electrified exit devices allow for greater control of the opening and can interface with other electronic equipment. They can either control the latch bolt of a device or control the locking of the operating trim.

There are two primary methods for electrically controlling exit devices:

1. **Electric latch retraction (ELR):** A solenoid or motor retracts the latch and holds it in the “dogged” (unlatched) position until power is interrupted, allowing the door to operate in a push-pull manner (Figure 9).
2. **Electrified operating trim:** The exit device remains latched, while the

exterior lever, knob or thumbpiece is electrically locked or unlocked for entry (Figure 10). This method supports both fail safe and fail secure.

Electrified exit device manufacturers offer a variety of trim options, rim mount, surface vertical rod and concealed vertical rod device types so panic and fire exit device solutions are available for virtually any door-opening application.

Cost-effective electric latch retraction (ELR) field modification kits are available to upgrade existing mechanical exit devices to electronic operation (Figure 11). These kits enable electric access control, allowing for simultaneous latch retraction and dogging functions.

Monitoring, Control and Accessories

What else do I need?

A variety of remote controls and annunciators are available to support control and monitoring applications without the need for PC-based access control systems. These solutions offer:

- Central monitoring and control of facility openings.
- Audible and visual status supervision and notification.
- Desktop modules with switches for releasing individual openings (Figure 12).
- LED displays to indicate door position or lock status, which can be installed at the door or centrally.
- Door prop alarms with timed delay, LED status and buzzer alarms to prevent unauthorized access (e.g., piggybacking or tailgating). Good access control communicates status as clearly as it restricts access (Figures 13 and 14).

Plus, there are a variety of electrified accessories and specialty items to enhance any EAC conversion solution. These accessories often represent modest



FIGURE 12. Desktop control modules have switches for releasing individual openings.



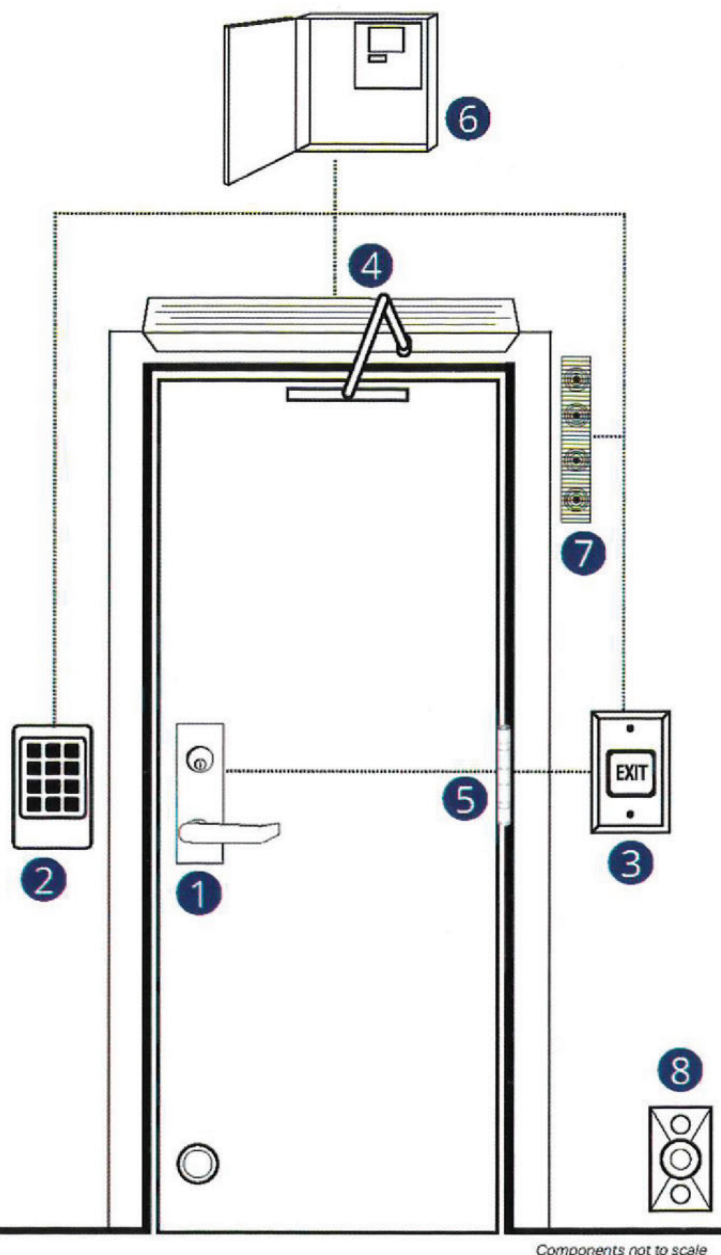
FIGURE 13. This multi-mode visual annunciator interfaces with delayed egress devices for forced entry or unauthorized exit signaling. Built-in sensors in the lock will activate a local and/or remote alarm upon attempting forced entry before the door has been compromised.



FIGURE 14. Door prop alarms can help prevent unauthorized access.

BASIC COMPONENT CONSIDERATIONS FOR CONTROLLED DOOR SYSTEMS

- 1 LOCKING DEVICES
- 2 ACCESS CONTROLS
- 3 EGRESS CONTROLS
- 4 ADA CONTROLS
- 5 POWER TRANSFER DEVICES
- 6 POWER SUPPLY & DOOR CONTROLS
- 7 REMOTE CONTROLS & ANNUNCIATORS
- 8 ACCESSORIES & MISC



Components not to scale

FIGURE 15. There are many product categories to consider when choosing EAC components.

cost additions with significant value.

For reference, *Figure 15* provides a visual summary of the categories of product recommendations to consider when upgrading any door from mechanical to electronic.

Closing Thoughts

Retrofitting doors for electronic access control represents a significant opportunity for today's locksmiths and door professionals — but only when

approached with proper planning and respect for code compliance. By grounding each project in a clear understanding of objectives, door function and hardware application, professionals can deliver solutions that are safe, reliable and profitable.

Remember, industry associations like ALOA, DHI (www.dhi.org), ESA (www.esaweb.org) and others have tools and training to help in your electrified door hardware and access control projects.

Finally, consult your local authority having jurisdiction (AHJ) for compliance requirements before starting any door installation project. 📌



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