

AN OVERVIEW

Alternative Approaches to Exit Devices and Electronic Options

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A required safety and security hardware

component in almost any building is an exit device to control unauthorized entry while also providing a means of safe egress to its occupants at all times. Profit opportunities exist for door and hardware practitioners to consider electronic options—either new or retrofit—as a viable alternative to providing greater control over door openings and to interface with other equipment in an access control system.

Some common solutions from a variety of manufacturers include electrified panic and fire-rated exit devices in rim mount, mortise and surface rod vertical configurations to comply with national and state building and fire life safety codes. (Figure 1)

Electronic exit devices used to be dominated by solenoid-operated locks that would control the latchbolt of a device or control the locking of operating trim. However, solenoids typically required a heavy current inrush of as much as 16 amps at 24VDC, with 300 mA continuous current. The sound generated by the action of the solenoid also was quite noticeable. Advances in motor technology have been employed by various manufacturers to replace solenoids with more efficient motors, requiring far less current inrush (as little as 700 mA) and operating far quieter.

Whether the electric locking and unlocking of the exit device is controlled with a solenoid or motor, the latch retracts and is held retracted until power is interrupted. The device is electrically “dogged” and the door operates in a push-pull configuration. Doors can now be controlled from a central point and dogged during working hours. At closing time these doors can be simultaneously relatched or during a fire emergency if tied-in to a central fire panel.

Single-door electric push bar and ADA bollard

In controlling the locking of operating trim with a solenoid or motor, the device will be allowed to remain latched. The exterior lever or knob will be locked or unlocked electrically to control entry. This type of configuration is available in either fail-safe or fail-secure modes. Stairwell openings are a great application for fail-safe mode as the doors must be available for reentry from the stair side during a fire emergency. (Figure 2)

Practitioners wanting to upgrade a door opening to electronic access control can simply replace the mechanical exit device with one that has electric latch retraction capability, as available from many manufacturers. Electric latch retraction enables electric access control and dogging of mechanical of rim, surface vertical or mortise exit devices. When energized, the motor retracts the exit device latch and pulls the pushpad on most devices into the dogged (depressed) position, enabling momentary or sustained push and pull operation of the door. (Figure 3)

An increasingly popular electrified safety and security application is for delayed egress in public facilities and airports for traffic control, retail locations for loss prevention, and health-care facilities to control wandering patients and guard against infant abduction. A simple solution to adding a delayed egress function to a door with an existing mechanical exit device is to install an electromagnetic lock with integrated egress logic, voice and digital display to provide instructions and alert security personnel, and a power supply.

There are also two-piece options with an electrified master exit device, a wall mounted controller with keypad, and built-in 15- or 30-second exit delay with some sort of visual and



FIGURE 1: MECHANICAL EXIT DEVICE



FIGURE 2: ELECTRIC LATCH RETRACTION

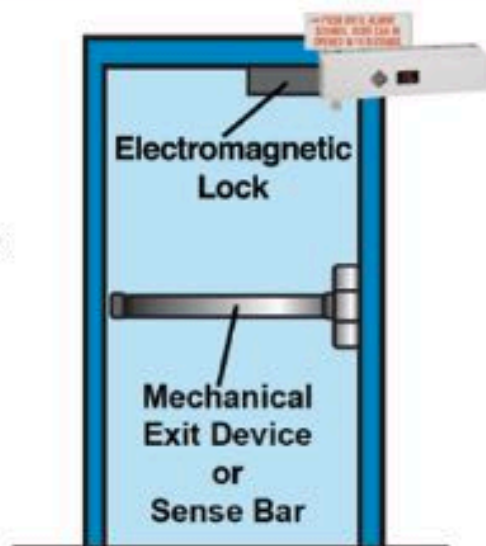


FIGURE 3: DELAYED EGRESS

Another alternative approach for exit devices can be applied for stairwell door reentry by combining an exit device with a frame actuator to control the locking and unlocking of the door to meet national building and fire code fire exit stairwell reentry requirements.



FIGURE 4: DELAYED EGRESS BUNDLE



FIGURE 5: DELAYED EGRESS ALL IN ONE



FIGURE 6: EXIT ALARM

audible announcement—also requiring a power supply. (Figure 4)

A great alternative delayed egress electrified option exists from a few select manufacturers that cleverly includes the controller and delayed egress logic, all integrated into the exit bar itself for a clean, simplified solution. (Figure 5)

Often, there may be a need to ensure a fire-rated door opening complies with fire and life safety codes to ensure safe egress in an emergency. Several manufacturers have electrified the exit device with built-in audible and visual alarms to guide a building's occupants by creating a clear path to safety and alarm output for remote sensing. (Figure 6)

Another alternative approach for exit devices can be applied for stairwell door reentry by combining an exit device with a frame actuator to control the locking and unlocking of the door to meet national building and fire code fire exit stairwell reentry requirements. The combination of the frame actuator with the exit device includes failsafe operation and unlocks by access control, power loss or signal from fire command center. The door stays latched even when unlocked. All wiring is maintained in the strike jamb to eliminate the need for a power hinge or wiring through the door. (Figure 7)

There are also electrified mortise exit devices to maintain fire door integrity while complying with national building and fire codes. Failsafe versions can be released immediately on loss of power or signal from the fire command center, but will remain latched when unlocked to maintain fire door integrity. (Figure 8)

Probably the most cost-effective alternative electronic options approach to an exit device is an electric latch retraction kit that allows for retrofitting of mechanical exit devices in the field, eliminating the need for costly replacement of the existing exit device. (Figure 9)

Practitioners may encounter more than two dozen brands of currently installed mechanical exit devices. Many of the major manufacturers offer some kind of electric latch retraction retrofit for their exit devices, but not all offer them. There

are some third-party manufacturers that offer retrofit kits, but they don't cover all the brands. One of the industry's major players actually provides kits for virtually all brands of exit devices.

Which manufacturer's kit to use will be governed by a variety of parameters including cost, compatibility, availability, power requirements, quietness of operation, warranty, and others.

All of these electric latch retraction kits enable electric access control and dogging of mechanical exit devices, and allow the latch retraction mechanism may be activated by an access control, remote control device or building automation system. They are designed so that the exit device always provides uninhibited egress to maintain national building and fire codes.

When choosing an electric latch retraction kit, consider how much inrush current they require to retract the latch and how much continuous current they draw when not activated. Lower current draws will enable longer wire runs with smaller gauge wire. Also look for kits that allow for upgrading the exit device without removing it from the door to save time and labor.

As always, you should consult the local Authority Having Jurisdiction for compliance requirements governing your door project, and be aware that building codes are always progressing and impact the application of access and egress solutions to doorways. But, with the thousands of new and retrofit doors requiring some sort of access control, using electrified exit devices "opens the door" to increased jobs and profit opportunities. ■

John L. Schum's Electronic Locking Devices from Butterworth-Heinemann Publishers was used as a reference for some content.



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FIGURE 7: ELECTRIC FRAME ACTUATOR



FIGURE 8: ELECTRIC MORTISE EXIT DEVICE

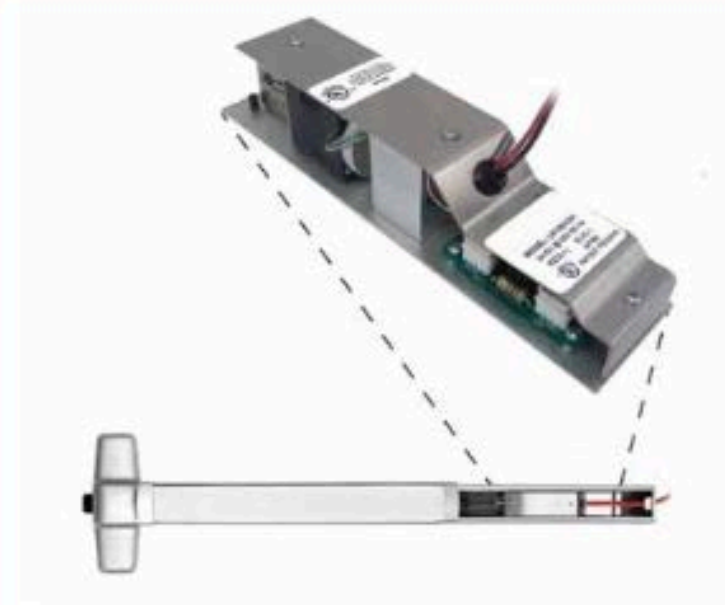


FIGURE 9: ELECTRIC LATCH RETRACTION KIT