An Introduction To Automatic Doors

(Market and Products)

January, 2013

The Auto Door Market

Overview

The Auto Door Market

Invention of Automatic Doors

-1954, by Dee Horton and Lew Hewitt.
These two Texans designed the first modern automatic sliding door.

-Horton and Hewitt went on to found Horton Automatics, one of the biggest sellers of automatic doors today, with a massive range of clients.

Size of (US) Automatic Door Market*

-$1,495.8 million in 2010

-$2,191.3 million in 2015, a CAGR of 7.9%

* IMS Research

The Auto Door Market

Automatic Doors and ADA

-Automatic Doors are installed for a wide variety of reasons:

- Consumer service.
  The public prefer/expect automatic doors in hotels/motels, shopping mall entrances and retail stores.

- Prestige
  Many businesses install auto doors to impress visitors

- Energy savings
  Auto doors reduce annual heating and cooling costs.

- Convenience
  Eliminates the need to manually open heavy or double doors

The Auto Door Market

Automatic Doors and ADA

-The Americans with Disabilities Act (ADA)

A federal law designed to provide equal access for all citizens. All buildings that are open to the public must provide equal access for people with disabilities. This means that all visitors and occupants must be able to safely enter and exit the building, and must also be able to move throughout the building without difficulty.

- The two key technical regulations are the ADA Accessibility Guidelines (ADAAG) and the Uniform Federal Accessibility Standard (UFAS). These are both based in large part on the technical criteria in the national voluntary consensus standard, ANSI A117.1

The Auto Door Market

Codes and Standards

-Each state interprets the requirements and enforces compliance.

-States have several different approaches to accessibility regulations.

- Some states have adopted ANSI A117.1, UFAS, ADAAG or model building code requirements, all of which are relatively similar.

- Another group of states rely on one or another of these sources as a basis but that have not adopted them by reference.

- A third, smaller group includes states with their own codes.

The Auto Door Market

Codes and Standards

ANSI A117.1 is the standard for Buildings and Facilities - Providing Accessibility and Usability For Physically Disabled People. Other codes and standards are referenced or may be applicable:

- **ANSI/BHMA A156.10 is the American National Standard for full power automatic door systems**

- **A156.19, American National Standard for Power Assist and Low Energy Power Operated Doors**

- **NFPA 101 and local fire codes**

The ADA Market

State	Statutes	Referenced/Conforms to
Alabama		ANSI/UFAS/SBC
Alaska		UBC
Arizona		UBC
Arkansas	Arkansas Fire Prevention Code	SBC
California	California Code of Regulation	NONE
Colorado		ANSI/UBC
Connecticut	Regulation 29-252-1a	ANSI/BOCA
Delaware	Delaware Architectural Accessibility Standards	ANSI
Florida		ANSI
Georgia		ANSI/BHMA/NFPA
Hawaii		UFAS
Idaho		ADAAG/UBC/NFPA
Illinois	Illinois Accessibility Code, Section 400.310 (j)	ANSI
Indiana	Indiana Handicapped Accessibility Standard	ANSI/UBC
Iowa	Iowa State Accessibility Codes	ANSI/UBC/UFAS
Kansas		ADAAG/NFPA/UBC
Kentucky	1991 Kentucky Building Code	ADAAG/BOCA
Louisiana		ANSI/NFPA
Maine	Maine Human Rights Act, Ch 6: Accessibility	ADAAG/ANSI/ BOCA
Maryland	Maryland Building Code for the Handicapped	ANSI/BOCA
Massachusetts	Rules & Regs. of the Mass. Architectural Access Board	NONE
Michigan	Michigan Construction Code	BOCA/2/3
Minnesota	State of Minnesota Facilities for the Handicapped	NONE/4
Missouri		ADAAG/BOCA
Mississippi		ANSI

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Adaptive Environments Laboratory, 1993

The ADA Market

State	Code	Standards
Montana		UBC/UFAS
Nebraska		NFPA/1
Nevada	Nevada State Fire Marshall's Regulation, UFC	ADAAG/ANSI/NFPA/UBC
New Hampshire	Architectural Barrier Free Design Code for New Hampshire	NONE/1
New Jersey	New Jersey Accessibility Code, Barrier Free Subcode,NJAC5:23-7	BHMA/2
New Mexico	New Mexico Building Code, 1993	ANSI/NFPA/UBC
New York	NYS Uniform Fire Prevention and Building Code	ANSI/BHMA
North Carolina	North Carolina State Building Code	ANSI/BHMA
North Dakota		ADAAG/NFPA/UBC
Ohio		ADAAG
Oklahoma		BOCA
Oregon	1993 Oregon Structural Specialty Code	ADAAG/NFPA/UBC
Pennsylvania		BHMA/1
Puerto Rico		No Response
Rhode Island		ADAAG/UFAS
South Carolina		ANSI
South Dakota		ADAAG/ANSI
Tennessee		NFPA/SBC
Texas	Architectural Barriers Act of Texas	ADAAG/ANSI/BHMA
Utah		UBC
Vermont		ANSI/BOCA/NFPA
Virginia	Virginia Uniform Statewide Building Code	ADAAG/BOCA
Washington	Washington Administrative Code 51-20-3304 E51-20-3106 (j)	ADAAG/ANSI/UBC
West Virginia		ADAAG/ANSI/BOCA/NFPA
Wisconsin	Wisconsin Administrative Code, ILHR 52.04 Barrier Free Environ.	NONE/1/5
Wyoming	Wyoming Statute 16-6-501	ANSI/UBC

1. Anticipates referencing ADAAG 2. Anticipates referencing ANSI 3. Anticipates referencing BOCA-1993
4. Anticipates referencing UBC 5. Anticipates referencing Federal Fair Housing Accessibility Guidelines

The ADA Market

Market Segmentation

Rank of Application Importance Percentage

1. Hospital 98.2%

2. Airport 94.9%

3. Hotel/Motel 86.8%

4. Shopping Mall Entrance 84.0%

5. Retail Store 80.1%

6. Government Building 70.9%

7. Office Building 70.0%

8. College/University 61%

9. Full service Restaurant 50.1%

10. Fast Food Restaurant 40.9%

AAADAM Survey

The ADA Market

Market Segmentation

AAADM Certified Installation Companies

- The American Association of Automatic Door Manufacturers

- Certifies automatic door installers/technician. Companies must derive a majority of their revenue from the sale and installation of automatic doors.

- No requirement under ANSI standards. Driven by specification writers (A&E) and manufacturers

- Camden is an AAADM member and accredited training company

Other Companies

- Many companies install and service automatic doors do not have AAADM certified installation staff.

- Low energy automatic door systems are drawing a wide variety of low voltage system contractors to the market.

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Types of Automatic Doors

Types of Auto Door Systems

Two Main Categories

Full Power Automatic Doors

Power Operated Pedestrian Doors encompasses automatic sliding, swinging and folding doors.
(*as described under A156-10)

Low Energy Power Operated Doors

Encompasses doors that operate at a slow speed with low power and can be remotely activated by a push switch / plate or other remote activation device.

(*as described under A159-19)

Types of Auto Door Systems

Sliding Doors

Single slide, bi-part slide and telescopic slide configurations. Typically activated by sensors.

Swinging Doors

Overhead concealed operators for direct drive applications or surface mounted for push and pull applications. Typically activated by push plate or sensors.

Folding Doors

Used to minimize the area required by swinging doors and where the advantage of a sliding door is desired but the walls beside the door are not wide enough. Typically activated by sensors.

Revolving Doors

Consists of three or four doors that hang on a central shaft. They reduce the heating or cooling required for the building. Typically activated by sensors but may have a 'push to slow' push button.
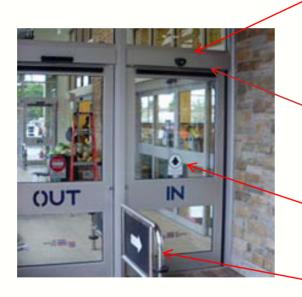
Types of Auto Door Systems

Components - Door, Operator and Other

Auto Door Sensors
ACTIVATION - Opens door
SAFETY - Prevents
closing on pedestrian

Door Operator
Mounted inside building, surface
mount above door or built into wall

Signage
Required on all Powered Doors

Guide Rail
Prevents pedestrians from being
struck by opening door

Types of Auto Door Systems

Components - Camden Product Categories

Door Control Relays
- Interface between activation device, operator, electric lock and other systems (access or fire)
- Sequence multiple doors

Automatic (Operator) Key Switches
- Mounts on door operator or door jamb
- Disables automatic doors when not in service

Switch Bollards (Mounting Posts)
- Allows person in wheelchair to easily activate switch without interfering with swinging door

Activation Switches
- The widest variety of sizes and shapes, all complying with ADA requirements.

Enclosures and Boxes
- Metal or Impact resistant ABS plastic.
- Narrow, single gang, double gang and escutcheons for any application.

Wireless Activation
- Exclusive 900Mhz. Spread Spectrum wireless technology
- Push plate switch or handheld key FOB transmitters
- Option to use virtually any narrow-band frequency transmitter

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Door Operator Control

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DOOR CONTROL KEY SWITCHES – CM-170/190

CM-170/6

CM-190/2

Camden key switches for automatic door operators are affordable high quality switches suitable for any project.

Features

• Metal faceplates

• Mount on jamb or door operator header

• 2, 3 or 4 position maintained & 2 position momentary models

• UL/CSA approved switch rated 4 Amps @ 125 VAC

• Key removable in all maintained positions

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DOOR CONTROL RELAYS – CX-SA1

The CX-SA1 will sequence an automatic operator and electric lock (any kind) or two doors that form a vestibule. It also becomes a latching relay with the flick of a switch. The CX-SA1 features a momentary and extended trigger, two relays (rated 2 Amps) and 3 timers. A range of triggering options simplify installation.

Door Sequencer

Features

- Separate triggers for sequencing and hold open applications
- Dry contact and/or hot trigger input on either trigger
- Stuck momentary trigger leaves the extended trigger functioning
- Noise filtering to protect against false triggering
- Separate wet and dry inputs
- Visible indicators for status of timers and relays
- Wide range of power supply options

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DOOR CONTROL RELAYS – CX-12

(De) ENERGIZE ELECTRIC LOCKS (including magnetic locks or electric strikes) and activate automatic door operator with adjustable time delays. Extend trigger to maintain signal to door operators in smoke EVAC door applications. Simplify wiring in telephone entry applications by eliminating the need for an isolating relay (to switch).

Bi-Directional Door Sequencer
Sequence two automatic doors in both directions. A typical application is controlling two vestibule doors, with sequential (time delayed) opening upon activation of both an exterior and interior door control switch.

Features

- 3 adjustable delays, up to 30 seconds
- LED's for visual display of relay status
- 12/24V AC/DC operation (non polarity)
- Accepts wet or dry inputs (4)
- Built-in surge protection
- SPDT contacts rated 3 AMPS @ 30V DC
- One shot design for security, or maintained output for smoke EVAC

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DOOR CONTROL RELAYS – CX-EMF2

All wiring connections and adjustments are made on the exterior of the plastic case with removable terminals to facilitate installation. Simple yet effective potentiometers enable settings to meet varied requirements. A power LED, 1 status LED, and five relay LEDs aid in set-up and troubleshooting.

Multi-function Relay

- Microprocessor control
- 5 Form C relay outputs
- Plug-In connectors facilitate wiring

- Accepts up to 8 Inputs
- 12-24V AC/DC

Selectabler Functions
- ABM Vestibule Control (Banks)
- Single door unsecured Washroom in shared-use facility
- Single door secured Washroom in shared-use facility
- Two-door unsecured Washroom in shared-use facility
- 2 / 3 door Airlock (with auto-crossing)
- 2 – 5 door Airlock
- 2 door Mantrap

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DOOR CONTROL RELAYS – RESTROOM CONTROL KITS

Camden offers a complete package of activation and control for restroom applications.

Includes
- CX-22 Dual Function Relay
- CM-AF500 'Occupied When Lit' illuminated sign
- CM-400/8 'Push to Lock' mushroom push button
- CX-MDC surface mount door contacts

Features
• 'Best in Class' product quality, features and warranty
• Best value
• Other kits available, including custom kits made to your unique requirements

Traditional ADA Compliant Activation
(Of Low Power Energy Doors)

Overview

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NARROW PUSH PLATE SWITCHES – CM-25 Series

CM-23

CM-25 Series all-active switches are heavy-duty, ADA-compliant door controls. The 1 53/4" x 4 1/2" rectangular faceplates are stainless steel or solid brass, and the assembly is designed for easy installation directly on the aluminum jamb (or use optional surface box). The N.O. tubular switch requires minimal frame cut out, is rated 3AMP @ 30 VDC and provides virtually silent operation.

Features
- Mounts in aluminum jamb or in surface boxes
- Durable stainless steel or solid brass construction
- SPST N/O switch, rated 3 amps @ 30 VDC
- Available in a range of architectural finishes
- Available in a range of text and graphics
- UL61058-1, IEC 61058-2-4 and CAN/CSA-C22.2 Compliant
- 3yr. 'Camden Tough' warranty with '2 for 1' replacement

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4 ½" ROUND PUSH PLATE SWITCHES – CM-40 Series

CM-40 Series all-active switches are heavy-duty, ADA-compliant door controls. The 4 1/2" round faceplates are stainless steel or solid brass, and the assembly is designed for easy installation directly on standard 2 x 4 electrical boxes, CM-47 round surface box or CM-49 Escutcheon.

Features
• A variety of mounting options
• Durable stainless steel or solid brass construction
• SPDT (and optional DPDT) switches are rated 15 amps @ 30 VDC .
• Available in a range of architectural finishes
• Available in a range of text and graphics
• UL61058-1, IEC 61058-2-4 and CAN/CSA-C22.2 Compliant
• 3yr. 'Camden Tough' warranty with '2 for 1' replacement

CM-47S

CM-49

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4 ½" SQUARE PUSH PLATE SWITCHES – CM-45 Series

CM-45 Series all-active switches are heavy-duty, ADA-compliant door controls. The 4 1/2" square faceplates are stainless steel or solid brass, and the assembly is designed for easy installation directly on standard single, double gang or 4" square electrical boxes (with CM-49C adapter plate). CM-43CBL or CM-540 surface boxes are are available. CM-45 Series switches are also compatible with Aura™ illuminated enclosures.

Features
- A variety of mounting options
- Durable stainless steel or solid brass construction
- SPDT (and optional DPDT) switches are rated 15 amps @ 30 VDC .
- Available in a range of architectural finishes
- Available in a range of text and graphics
- UL61058-1, IEC 61058-2-4 and CAN/CSA-C22.2 Compliant
- 3yr. 'Camden Tough' warranty with '2 for 1' replacement

CM-43CBL

CM-540B

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6" ROUND PUSH PLATE SWITCHES – CM-60 Series

CM-60 Series all-active switches are heavy-duty, ADA-compliant door controls. The 6" round faceplates are stainless steel or solid brass, and the assembly is designed for easy installation directly on standard single, double gang or 4" square electrical boxes (with CM-49C adapter plate). CM-69 surface mount enclosure and CM-79 escutcheon are also available.

Features
• A variety of mounting options
• Durable stainless steel or solid brass construction
• SPDT (and optional DPDT) switches are rated 15 amps @ 30 VDC .
• Available in a range of architectural finishes
• Available in a range of text and graphics
• UL61058-1, IEC 61058-2-4 and CAN/CSA-C22.2 Compliant
• 3yr. 'Camden Tough' warranty with '2 for 1' replacement

CM-69S   CM-79

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New In ADA Compliant Activation
(Of Low Power Energy Doors)

Overview

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HANDS – FREE SWITCHES – CM-324 Series

Sure-Wave™ touchless switches are recommended for use in barrier-free applications, restrooms, hospitals and clean rooms. Sure-Wave™ is also ideal for commercial and industrial applications where hands-free activation is desired, such as drive-up windows, and kitchen doors in restaurants.

Features
• Advanced active infrared sensor technology
• Impact and flame resistant polycarbonate or stainless steel faceplate
• Double gang, single gang and narrow faceplates
• Adjustable operating range 1"-26"
• Adjustable time delay 1 –5 seconds
• Fail-safe/non-fail-safe selectable
• On-board LED for ease of set-up (selectable on/off)
• Super-fast activation response <100ms • 12/24 V AC/DC
• Heavy duty 5 amp relay, for use with all automatic operators and electrified locks
• ROHS compliant

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ILLUMINATED PUSH PLATE ENCLOSURES – CM-54 Series

Aura(tm) illuminated push plate kits provide higher visibility and enhanced user convenience in ADA compliant automatic door and other applications.
CM-54B model features a continuous back lit, blue illumination.
CM-54BR and CM-54GR are the first 'color changing' illuminated enclosures in the industry and offer 3 additional features: selection of backlight colors (blue/red or green/red), an audible sounder that confirms switch activation and Form 'C' contacts.

Features
 • High efficiency LED technology
• Improves switch visibility, even in daylight
• Flame and impact resistant polycarbonate box
• Selectable 12 or 24V AC/DC

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36" PUSH PLATE SWITCHES - CM-75 Series

Column™ push plate switches offer an elegant design that is attractive, easy to operate and built to last . Models are available in anodized aluminum finish (epoxy printed blue graphics) or dark bronze anodized finish (epoxy printed white graphics).
The innovative end caps are made of impact and flame resistant polycarbonate, designed for easy 'snap-in' installation and service of Lazerpoint RF™ wireless transmitters and batteries. Column(tm) push plate switches are ADA compliant and exceed the requirements of the California Building Code, Section 1117B.6.

Features
- (2) Fully redundant SPDT, 15 Amp. UL listed switches (CM-7536)
- Choice of 4 different stock graphics
- Optional 'snap-in LAZERPOINT RF(tm) wireless transmitters
- Adjustable leveling screws for easy installation on uneven walls
- No internal wires exposed to moving parts

Wireless Activation System

Overview

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USE OF WIRELESS SYSTEMS

LAZERPOINT RF™
BY CAMDEN

Wireless activation of door operators is an important part of the automatic door market – and wireless applications are growing!

WHY?

• **Lower Installed price**. Wireless systems are a little more expensive than wired systems but the labor cost savings are so large a finished installation costs 50% less.

• **More reliable systems**. New wireless systems overcome the problems with radio transmission and battery life that have limited their use in the past.

• **Easy to learn/install systems**. New features, such as automatic TX enrollment and built-in signal strength indication, makes systems easy to understand and install.

• **Compatibility.** Camden's wireless system has a range of low cost, plug-in, receiver daughter boards that can integrate other brands of transmitters.

• **Built-in relay control.** Installers don't have to buy a wireless system and door control relay. The wireless receiver will do both.

• **Size.** New transmitters and receivers are small enough to be installed anywhere, even in the operator case.

LAZERPOINT RF™ WIRELESS SYSTEM

• **Lazerpoint RF is a completely new type of wireless solution for automatic door operators that introduces proven 915Mhz. spread spectrum wireless technology. The system encompasses the widest range of transmitters, receivers, activation devices and switch enclosures available today.**

Features
• Reciever: 12 or 24V AC or DC operation.
• Advanced 915MHZ Spread Spectrum (Broadband) communications for outstanding performance in all applications.
• Ultra compact designs, fit where other wireless products can't, including in door operator cabinet/header.
• Multi-year battery life (using inexpensive 'AAA' alkaline batteries) with 500,000 activations.
• Exclusive 'auto enrollment', 'low battery' test gauge and 'stuck switch' alarm.
• Optional plug-in receiver modules provide compatibility with (narrowband) RF transmitters)

CM-TX9
1 Channel
Transmitter

CM-RX91
Single Relay
Receiver

CM-RX92
Two Relay
Receiver

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LAZERPOINT RF™ WIRELESS KITS

Camden makes purchasing and installing Lazerpoint RF wireless door control as easy and economical as possible. CM-RFL kits offer a complete system in one box.

(2)	**Push Plate Switches**	
	CM-RFL454	(CM-45/4)
	CM-RFL60469	(CM-60/4)

(2)	**Surface Mount Boxes**	
	CM-RFL454	(CM-43BL)
	CM-RFL60469	(CM-69S)

(2)	**Switch Transmitters**	
		(CM-TX9)

(1)	**Receiver**	
	1 Relay	(CM-RX91)
	2 Relay	(Add 'D' to model #)

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LAZERPOINT RF™ ENABLED KEYPADS

• **Camden is the first in the industry to introduce a plug-in transmitter option to their stand alone or Wiegand Keypad. CM-TX99 2 channel Lazerpoint RF™ transmitters follow the keypad relay contacts and it ispossible to control up to 6 relays with 1 keypad (2 wired keypad relays, and 4 CM-RX92 receiver relays)!**

Keypad Features
• Stand alone, Wiegand, optional wireless
• Indoor and Outdoor models
• 999 users, fixed or variable length codes
• (2) 3 Amp Form 'C' relays, with independent control
• Global lock-out, anti-tailgating and door open alarm
• REX and door contact inputs

Wireless Features
• Advanced 915MHZ Spread Spectrum (Broadband) communications for outstanding performance in all applications.
• Exclusive 'auto enrollment' and signal strength indication.

CM-TX99
2 Channel
Plug-In
Transmitter

CM-120wV2
Weatherproof
Backlit
Keypad

Automatic Doors & Access Control

Automatic Doors & Access Control

Access Control Features Are Commonly Integrated with Automatic Door Systems

Controller (CX-12)
Interface to connect both systems

Timers (CM-247)
Stand alone timers can be used to enable/disable activation switches at specific days and times.

Small Access Control Systems (CV-601)
Simple 1 or 2 door systems are very affordable and can be programmed without a computer. Prox. cards or tags can be used.

Large Access Control System (CV-32A1)
Used for more than 2 doors and a few hundred users. Also provides audit trail, multiple security levels, remote monitoring/programming, etc.

Electrified Locks (CX-EPD2040L)
Strikes or magnetic locks used to restrict access to specific times or by credential (reader, FOB or keypad)

Stand Alone or System Keypads (CM-120i)
Commonly used in daycare or other applications that do not require high security control of user credentials)

'Request to Exit' Switches (CM-420PTE)
NFPA and IBC codes require assured 'means of egress'. REX switches and/or sensors are required wherever mag locks are used on exit doors.

Ready to Support Your Business!

- Camden is a one-stop manufacturer of accessory products for any automatic door application.

- Camden accessory products are priced far, far below accessory products offered by door operator suppliers (because we make them ourselves).

- Camden offers completely unique products and product features that allow a single product to be used in more applications, provide better service to end users and help installers complete the job sooner.

- Camden offers the very best product warranty in the business!

Ready to Support Your Business!

- Product Catalogs and Sales Sheets on Request

- Wide Range of Displays and Signage for Showrooms

- A Complete Library of Online Product Information (Spec sheets, Manuals, Images and more)

- Online Switch Selection Wizard, with A&E submittal sheets

- Online Distributor Net Pricing (with web site reg.)

- Highly responsive Customer and Technical Support

- Stocking Warehouses in CA. and NC

- Next day shipping. No min policy. Free drop ship.

Introduction to Automatic Doors

Thank You!