

Q *What is a mantrap?*

A A mantrap is a security device that monitors and controls two or more interlocking doors to a small room that separates a non-secured area from a secured area. These interlocking doors allow only one door to be open at any time.

Q *What are interlocking doors?*

A “Interlocking doors” is a security term used to describe how two or more doors are interfaced with each other and locked. Doors that are interlocked cannot be open at the same time. Either door can be unlocked and opened as long as the other door is locked and closed, and no other alarm condition exists.

Q *What types of locations require a mantrap?*

A Mantraps are used at high value or critical security areas where only authorized persons are allowed to enter. Typical areas include sensitive data processing areas, cash handling areas, critical research labs, security control rooms, and automated airline passenger entry portals.

Q *How secure is a mantrap?*

A The system can be very secure if procedures are set in place on how to handle violations, if the security staff is alert and responds diligently to the alarms, and if the employees have been properly trained in using the system.

Q *Are mantraps ADA compliant?*

A As long as the doors are ADA compliant, and the space between the two doors meet ADA requirements, then the mantrap system is compliant.

ADA states:

4.13.7 Two Doors in Series. The minimum space between two hinged or pivoted doors in series shall be 48 in (1220 mm) plus the width of any door swinging into the space. Doors in series shall swing either in the same direction or away from the space between the doors.

4.13.5 Clear Width. Doorways shall have a minimum clear opening of 32 in (815 mm) with the door open 90 degrees, measured between the face of the door and the opposite stop.

Q *Why is it called a mantrap?*

A Before electronic security was available, vestibules with two electrically locked doors were used to control access into sensitive areas. These doors were controlled by security personnel whose job was to determine if the person trying to enter was allowed into the area. The individual was allowed through the first door where his credentials would be checked and verified. If the person was trying to enter without authorization, then the guard would lock the doors, trapping the individual within the vestibule. This allowed the security personnel time to physically remove the intruder and question them.

Q *Will the fire marshal approve the use of a mantrap?*

A Fire codes require an emergency exit path out of all occupied rooms. If there is not an emergency exit-only door out of the secured area, then the mantrap door hardware will need to include approved free-exiting devices that override the mantrap controls. Using the emergency exit devices will cause an immediate mantrap alarm.

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Q *What is the difference between a mantrap and an interlocking door control system?*

A When speaking of controlling two doors within a vestibule, “mantrap” and “interlocking door controller” can be used interchangeably. Once the number of doors controlled by a single controller exceeds two then the term interlocking door controller should be used.

Q *Is a mantrap an automatic system or does it require a person to operate the controls?*

A Mantraps can be automatic systems that operate without direct manual control, or they can be operated entirely by a person at a pushbutton control panel.

Q *What are the differences between an automatic mantrap and a manually controlled mantrap?*

A A manually controlled mantrap requires that a person is always at a control panel ready to operate the mantrap. An automatic mantrap can operate without security personnel intervention except during alarm or bypass conditions.

Q *What are the cost differences between an automatic mantrap and a manually controlled system?*

A A manually controlled system can be as simple as a basic relay logic circuit with a pushbutton panel. The cost of the relay and panel can be less than \$1,000 plus the cost of creating the small room with two doors.

An automatic mantrap system is an intelligent controller with displays and an interface to the building access control system. The cost for an automatic system can start around \$5,000 plus the cost of an access control system and installing the second door.

The lifetime cost of an automatic system is considerably less than a manual system because the salary of the security personnel required to monitor and operate the manual system over time is eliminated.

Q *How does a mantrap control access?*

A An access control system is necessary to grant access to the mantrap. A card reader or biometric device is used to identify persons wanting to pass through the mantrap. Once a person is identified and authorized, then the access control system activates an “access granted” signal to the mantrap control board. If the mantrap doors are closed and there is no alarm condition active, then the mantrap controller will unlock the requested door.

Q *How does the access control system interface with the mantrap control system?*

A Most access control systems can provide relay contacts to the mantrap system inputs. Typical control signals are REQUEST TO UNLOCK OUTER DOOR, REQUEST TO UNLOCK INNER DOOR, and SYSTEM BYPASS. Other signals may be LOCKDOWN, COUNT BYPASS, and TIMED BYPASS.

The mantrap relay outputs interface to the access control system’s inputs to indicate the operational condition of the mantrap. Typical output signals are DOOR ALARM, INTERLOCK VIOLATION, BYPASS CONDITION and COUNT ALARM.

Q *What kind of response can be caused by an alarm?*

A When a mantrap alarm occurs, then an alarm relay contact is activated. The building access control and security system can then turn on cameras, digital recorders, and automatic intercom systems so that security personnel at a monitoring station can observe and assess the conditions at the mantrap. They can then determine if a guard should be sent to the area, or if the person is to be allowed to pass through the mantrap.

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Q *How is the user prompted to navigate through the mantrap?*

A The mantrap includes LED displays that provide messages to the user as to what he is required to do. The standard indications are READY, ACCESS GRANTED and BUSY.

Q *Can the text on the displays be changed?*

A The text may be changed to fit the requirements of a location. For example, READY may be changed to PRESENT CARD or PRESENT FINGERPRINT. ACCESS GRANTED may be changed to PROCEED. Other text or languages may be used.

Q *Does the mantrap system know if more than one person enters the mantrap with a single valid access granted signal?*

A The basic system only monitors and interlocks the doors. Additional sensors or zoned floor mats are required to monitor the number of people using the mantrap.

Q *What is a zoned floor mat?*

A A zoned floor mat is an industrial grade pressure sensitive mat with one small area or zone small enough for only one person to stand in and another zone that covers the rest of the floor area of the mantrap. Reliable zoned floor mats for a mantrap must be custom fitted to each mantrap and typically cost between \$5K and \$10K. Commercial grade under-the-carpet mats are less costly, but will require periodic replacement.

Q *What kinds of sensors are used to monitor the number of people using the mantrap?*

A Directional sensor arrays mounted on the door frame can count the number of persons entering the doorway. These sensor arrays are typically referred to as TAILGATE SENSORS.

Q *What are tailgate sensors?*

A Tailgate sensors are multiple infrared beams that are aimed across a doorway. The beams are positioned so that as a person walks through the doorway, some beams are activated and then other beams are activated a short time later. The tailgate processor monitors these beams and determines which direction the person is walking. The processor will count the number of persons walking through the beam array. Only one person is allowed to walk through the beam array for each valid card presented. An alarm is generated if a person walks through the beam array without a valid card.

Q *Can the tailgate sensors be used on double doors?*

A The tailgate sensors may be used on double doors. However, if the doorway opening is wide enough for 2 people to walk side by side, then the tailgate sensors may possibly be defeated.

Q *Can side by side passage be detected?*

A An overhead sensor array mounted on the same door frame as the tailgate sensors can detect persons walking side by side, and generate an alarm.

Q *How accurate are the tailgate sensors for determining that more than one person entered the mantrap?*

A The tailgate sensors are in excess of 99% accurate if properly installed and aligned.

Q *Do both the outside door and inside door of the mantrap need to have tailgate sensors mounted on them?*

A If anti-pass back, or card in / card out access control procedures are in effect, then tailgate sensors on both doors will help enforce those rules.

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For card in / free exit locations, tailgate sensors may be used on the outside door only to strictly enforce entry procedures into the secured area while allowing free exiting.

Q *How quickly can people navigate through a mantrap?*

A Most mantrap systems require that only one person at a time pass through the mantrap. The time it takes to pass all the way through the mantrap will be affected by the card reader or biometric system response time, the speed of the automatic door closers, and the level of training of the person using the mantrap. It normally takes a single individual approximately 20 to 30 seconds to pass through the system.

Q *Can more than one person pass through the mantrap with tailgate system?*

A Card stacking can allow multiple persons to enter the vestibule during a single door opening. The tailgate system will count the number of valid cards presented and allow the same number of persons to enter the mantrap.

Q *Can someone be physically trapped in a mantrap?*

A With exiting hardware on the doors, individuals should always be able to exit through the mantrap. If they have not properly presented valid access credentials, an alarm will sound but they will be able to exit into the unsecured area.

Q *How much training is required before an employee feels comfortable using the system?*

A Allow approximately one hour of training or study explaining the operation and use of the system, then about two weeks of the employees actually using the system and getting the feel of how to navigate through the vestibule.

Q *What happens if a person loses his card, how will he get through the mantrap?*

A Security personnel are able to remotely allow an individual through the system, or a temporary access card can be issued for the day.

Q *Can carts be pushed through a mantrap?*

A Security personnel can remotely bypass the system to allow carts to be brought into the area.

Q *How do large groups of people pass through a mantrap?*

A A count bypass input can be activated that will allow small groups to enter the mantrap. For larger groups the unit should be bypassed by security.

Q *How is the mantrap system installed?*

A The mantrap system must be installed by a qualified security integrator. Some locations will have a technical installation group within the security department. If this group has experience with access control, locks and cameras, then they should be able to install the mantrap system.

Q *What size vestibule is required for the mantrap to operate properly?*

A There must be enough space for two doors and enough room inside for employees to navigate through the vestibule. In many cases, customers use an existing corridor and add a wall and door to create the vestibule. ADA requirements also regulate the size of the vestibule to no less than 60" x 60".

Q *Can double doors be used with a mantrap system?*

A Double doors may be used, however, it is recommended that one leaf of the door be locked down, making the other the primary

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Q *How much space is required to mount the electronics?*

A The LED displays mount in a standard single gang electrical box. The mantrap controller can be mounted in either a 12" x 16" or 20" x 16" Hoffman box depending on the options required for the system. These units can also be mounted directly to an equipment closet backboard or, if there is room, above the ceiling tiles. The tailgate sensor housings are mounted directly to the door frames on the side opposite of the door swing.

Q *What are the typical system components used in a mantrap?*

A The mantrap controller and tailgate sensors will monitor and control the mantrap. Other components necessary are: Access Control System, card readers or biometric readers, electric locks, cameras, digital video recording system, intercom system, remote monitoring and control panel, an alarm sounder, and a strobe mounted above the outside of the unsecured side door.

Q *What are some of the operational problems encountered when implementing a mantrap?*

A Employee training is one of the key concerns when implementing a mantrap system. Most of the operational problems are due to lack of knowledge on how to navigate through the system. These include frustration due to access credentials not being acknowledged, nuisance alarms caused by objects being carried improperly into the vestibule, and alarms created by walking into the system incorrectly. In addition to these, the system requires calibration and adjustment in the beginning as the mantrap is put into full service.

Q *Can this type of system be used in an exterior application?*

A Yes, the mantrap system can be utilized in an outdoor environment. Site ready outdoor mantrap systems with 2 interlocking doors may be constructed for free air flow using expanded metal, wire mesh or fencing material. Enclosed buildings with air handling systems may be implemented in environments where temperature extremes are common.

Q *Can this type of system be utilized to control vehicles instead of people?*

A This system can be utilized to control parking gates and barriers in the same fashion that it controls doors

Q *Is a mantrap cost effective?*

A Yes, instead of having security personnel posted at each sensitive area, the mantrap allows security personnel within the control and monitoring room to handle most incidents and keep track of the violations. They can dispatch a guard to the mantrap if a situation requires it.

Q *How much does an automatic mantrap system cost?*

A An automatic mantrap system can range from \$15K (installed) to around \$25K for that same system with tailgate monitoring. Pre-fabricated automatic door systems are priced about \$75K to \$100K installed.

Q *What is the return on investment?*

A Posting a 24-hour guard at the entrance to a high value area requires three or four full time persons daily. The cost of their salaries, taxes, insurance and benefits can add up quickly. An automatic mantrap control system, once installed, only requires external human intervention when there is an alarm or bypass condition. The cost of the installed mantrap can be recuperated in less than one year based on savings in labor costs alone. A high value room containing sensitive data processing, critical research labs, large amounts of cash or other valuable items is insured at a rate that reflects the risk of insuring the contents of that room. Similar to homeowner's policies, a location with an automatic mantrap control system will have lower premiums than one without.

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