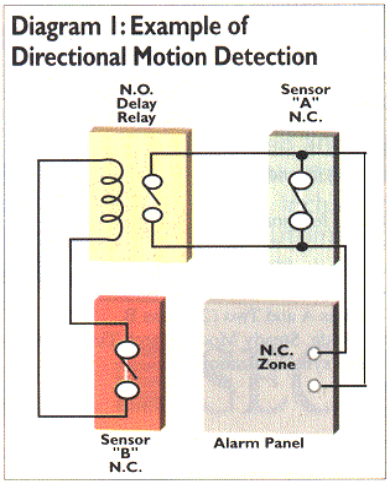
Tech Talk
With Bob Dolph

WARNING!
You're Going the Wrong Way

Since the Sept. 11 terrorist attacks, the security community has been under increased pressure to implement security measures that track and restrict the activities of individuals within a facility. Recently, there were several incidents at airports in which a person entering an exit passageway caused considerable chaos throughout the facility. The use of passage-monitoring technology can help meet these rigorous security demands.

We are going to look at how to take existing sensor technology and configure it to meet these security demands along with other technologies designed specifically for traffic supervision. We will be looking at several key technology areas with reference to their respective manufacturers. These review areas will be configuring motion sensors for "directional detection," allowing sensors to ignore traffic in one direction and detect it in the other, optical turnstiles, and video motion detection.



This diagram depicts basic directional detection configuration for a passageway exit area. An alarm is generated when a person enters the secured exit detection zone. Guard resources are better utilized when mixed with various detection technology.

Use Sensors to Prevent People From Intruding

Several manufacturers currently have sensor technology specifically designed not only to sense movement of equipment and people, but to indicate the direction of that movement. Being able to monitor this movement without additional physical barriers allows for better traffic flow and a less visible presence of locked gates and doors. Sensors can be configured to activat a digitally recorded message, such as, "Warning, Do not proceed", bring up a CTV camera and notify a guard.

Vehicular movement can be indicated with the installation of a magnetic probe system such as the one from Sure Action (www.sureaction.com). The probes sense the movement of a large metal mass and can be mounted either alongside or under the roadway. A directional probe and special processor is available for directional detection. A probe can cover a driveway up to 14-feet wide.

Sure Action also makes a strain gauge sensor called the Pulsor. The concealed, under-floor sensor detects the minute flexing of the floor from a person's weight. It can be applied to the underside of floors, boat decks, stairs, ladders, and other building structures. Discrimination can be adjusted between the weight of a dog and a human.

The Pulsor sensors can also be configured for directional detection with the probe processor. This sensor not only has interesting applications for security, but for home automation as well.

Create Simple Directional Motion Detectors

An example of directional motion detection is provided in *Diagram 1*. In this example, two spot-type passive-infrared motion detectors are placed in the ceiling. Sensors are sequentially positioned so that the detection areas are allowing detection by one sensor, then the other, depending on the movement of the person through the secured-area exit passageway. Since there are no physical doors or gates, pedestrian traffic flows freely in both directions.

Moving toward the exit would first activate sensor "B," which would activate a time-delay relay for a brief period of 30 seconds or less. As the person continues in the correct direction, sensor "A" is tripped but does not indicate an alarm to the control panel since it is still shunted by the delayed closure (*see Diagram 2*). After the time delay period, both sensors are reset for further detection. See the directional relay activation graphs in the lower part of Diagram 2.

A person entering the secured exit area and traveling in the wrong direction would activate sensor A first.

Because sensor A has not been shunted by activation from sensor B, an alarm condition is activated at the control panel. This alarm condition

Bob Dolph has served in various technical management and advisory positions in the security industry for 25 years. Bob currently is a training and products consultant for the security industry. He lives in Orlando, Fla.

BOB'S TIPS

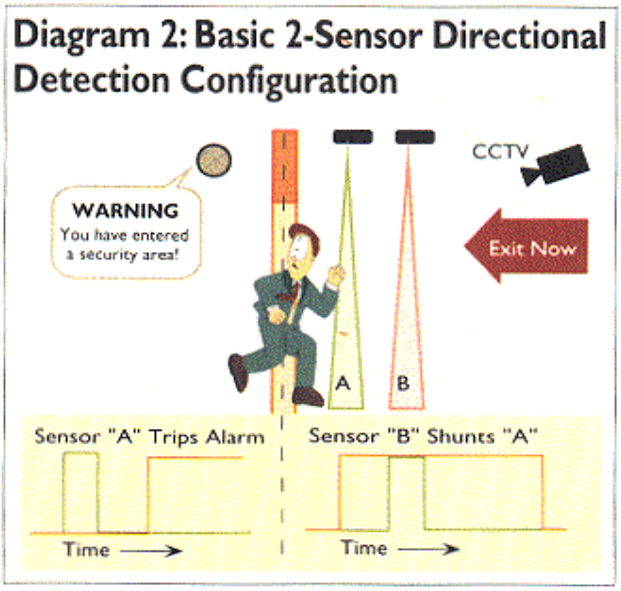
- Passage-monitoring technology can help meet rigorous security demands.
- Sensors can be configured to activate a digitally recorded message.
- Signs in the area are recommende to encourage traffic to move in only one direction.
- Optical turnstiles are often integrated with card readers and are used for detecting such illegal access control actions as "tailgating".

Tech Talk
With Bob Dolph

could trigger a digitized audio message warning the person not to proceed, automatically select a PTZ CCTV camera location, or notify a security guard.

This would allow for a good camera face shot of the person who violated the exit area. Signs in the area are recommended, encouraging traffic to move in only one direction. By placing the sensors over an open doorway, traffic is reduced to a single line to minimize conflicting activation. This configuration could be applied to any low-volume passage area and is a simplified version of optical turnstiles.

The spot motion sensors used for this application should be of a fast-acting, single-pulse variety. Dexter research Center (www.dexterresearch.com) makes a low profile spot detector called the Thermacon. The T-80 unit can be ordered with a built-in 1-second to 30-second delay relay. A variety of interchangeable masks are available to help customize the detection pattern.



Additional sensor zones could be used for early warning and better activity discrimination.

Choose a Panel Suited to 'Follow' Duty

Alarm control panels like the Napco Gemini P9600 have advanced zone programming functions, such as "follow zones," that allow one zone to activate an add-on RB-3008 relay based on the action of another follower zone.

An interesting variation of the "request-to-exit" (REX) sensor is made by Visonic Ltd. (www.visonic.com). The model B-2 is a ceiling-mounted directional PIR detector. It comes standard with two detection zones and an output relay for each zone. The unit has a delay zone similar to the operation shown in *Diagram 1*.

The exit delay can be set from a few seconds to 10 minutes. It can be mounted in the ceiling above an exit door and work similar to a REX sensor, or could be mounted over a hallway opening, as shown in *Diagram 1*, and detect direction. When configuring the sensors, remember, the longer the time delay setting, the more opportunity someone has to go undetected in the wrong direction just after someone has exited the area. Always remember that exit control device installations should comply with NFPA 101 Life Safety Code guidelines.

Another directional PIR sensor that I have run across is the Optex (www.optexamerica.com) multi-stabilized outdoor detector VX-40/40A. This PIR sensor is designed with an optional logical AND connection. The unit, when provided with an additional PIR sensor, can sense motion only in one direction. The VA-40A model has a built-in speaker and two types of digitized audible warning messages.

I would recommend an optical turnstile for better control in high-traffic passageways. This system allows for fast directional traffic flow (two people per second) with a more sophisticated array of infrared beams and motion sensors built into a steel turnstile or bollard.

Some optical turnstile manufacturers are Alverado Manufacturing (www.alvaradomfg.com), Kouba & Associates, Inc. (www.koubasystems.com), Designed Security Inc. (www.designedsecurityinc.com). The DSI E820 component kit allows for retrofitting sophisticate optical turnstile technology into existing bollard furniture/fixtures.. Alverado has a new overhead counting system called the OPS system which uses artificial intelligence to track pedestrian traffic.

Optical turnstiles are often integrated with card readers and are used for detecting such illegal access control actions as "tailgating." Tailgating is when a person illegally holds the door open for another. Good optical turnstiles can detect two people who are as little as a 1/4-inch apart.

Artificial Intelligence Is Changing Detection

One of the most exciting areas of directional detection technology is digital video motion detection (VMD). While the technology of VMD has been around for many years, digital CCTV technology now allows for new detection methods. Proprietary analysis software like Behavior Track(r) from Loronix (www.loronix.com) allows for video to be analyzed for events such as loitering, a person entering an exit or a vehicle parked at an entrance. Systems such as the DigiSpec (www.digispec.com) DS-1PL can be retrofitted into existing CCTV systems for directional detection. The unit has features such as area A>B direction detection, motionless areas and museum mode. Museum mode detects when something has been removed from the camera viewing area within a certain time period. If you are looking at a sophisticated airport application, checkout FAA-approved systems such as the ExitSentry(tm) from Cernium Inc. (www.cernium.com). Systems such as these offer video technologies that allow for better guard resource allocation.