

ELEVATOR WORLD

A globe with a yellow banner wrapped around it that says "50TH YEAR".

AUGUST 2002

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CRITICAL REQUIREMENTS OF TODAY'S ELEVATOR LIGHT SCREEN DOOR CONTROLS

by Robert A. Warner, Tri-Tronics Co., Inc.

Improved Immunity to Ambient Light

Today's elevators require light screens to be totally immune to all ambient light sources. Many passenger elevators in new buildings use glass window panels that expose them to direct sunlight. In addition, many new buildings are utilizing the newer fluorescent light fixtures that pulse at much higher frequencies. These situations can cause erratic performance by elevator door light screens designed in the past.

In industrial and airport buildings, many forklift trucks and passenger vehicles use high-powered strobes that can also interfere with light-screen door-control performance. The newly introduced Leading Edge™ system is designed to withstand all ambient light sources found in these and other tough environments. It should also be noted that the new high-frequency fluorescent lights and high-powered strobes can also interfere with some of the original backup photoeyes mounted 5 inches and 29 inches above thresholds on many elevators equipped with mechanical safety edges. This can be an overlooked problem in some applications.

Improved Immunity to Static Discharged and RF Transmitters

Even today, many elevator passengers reach out and place their hands across the edge of doors, as they did on mechanical door edges in the past, to keep the doors from closing on them. When this hand contact occurs today, a high-voltage static discharge could go through the housing and circuitry of the electronic light screen arrays. These high-voltage discharges cause "unexplained" door-protection system failures that often occur in winter months when humidity is extremely low. An example would be walking across a carpet and touching the edge. The new systems are designed to withstand interference from static electricity discharge, as well as from high-powered walkie talkies, cell phones and strong RF signals radiating from airport radar systems.



Eliminate water damage

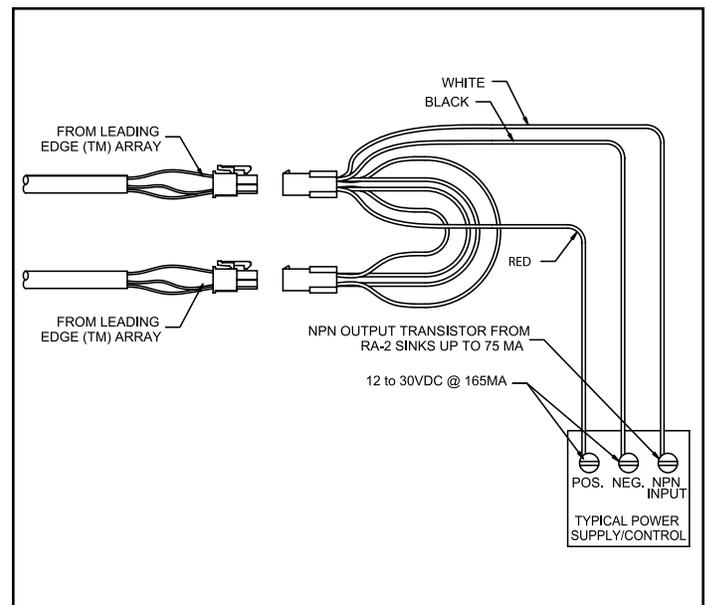
Improved Resistance to Water Damage

Many elevators are exposed to the detrimental effects of water. This is especially true with outdoor elevators, with parking garage elevators and during elevator lobby cleaning. The Tri-Tronics system was designed for the National Aeronautics and Space Administration (NASA) to withstand the release of 320,000 gallons of water on the launch-pad elevators during shuttle launches. There are no "O" rings or gaskets used; instead the system is completely epoxy filled. It will even resist leakage when completely submerged and will survive high vibrations. The Leading Edge is excellent for condos, hotels and other buildings located near saltwater, since it will resist contamination and circuit-board corrosion.

Improved Operation Under Brownout and Power-Up Conditions

The 120VAC power used for accessory control devices found in many elevators can sometimes vary to the point where it can be quite low. To be safe during a brownout condition, the light-screen edge should operate at a voltage of 85 to 90VAC. The power supply/controller should also be capable of withstanding high voltages of 150 to 160VAC. After a power outage, when the power is restored, the system must also withstand erratic transients that in the past have "locked up" many microprocessors. These types of failures usually require a service call. It is important to utilize a system that can withstand these conditions.

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Compatibility with existing power supplies

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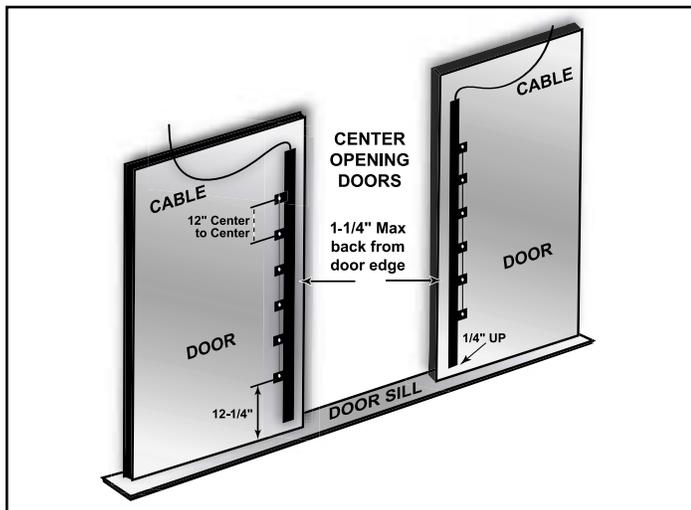
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The Need for Wide-Beam Optics

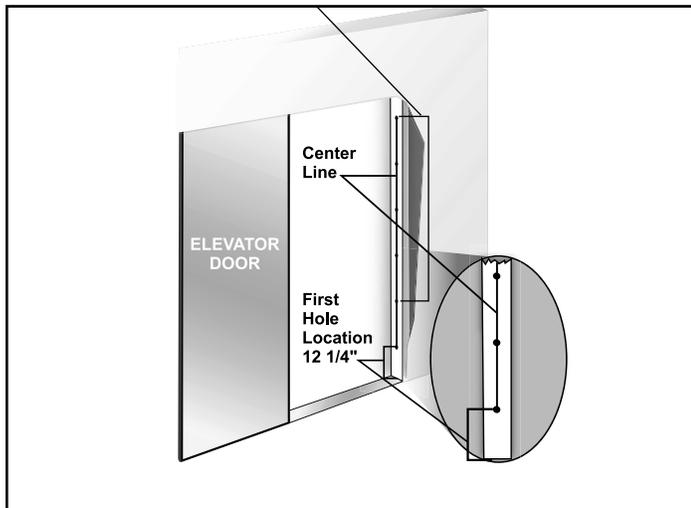
Early light screen edge designs often made it difficult to align the multiple transmitted light beams with the receivers. This is a problem on older unstable elevator doors. The Leading Edge design allows the system to operate on doors that are misaligned by as much as $\pm 30^\circ$ at a distance of four feet between doors. This system has also been used with success on many round elevators that have a very tight turning radius.

The Need for System Compatibility

Many systems are designed with the microprocessor and control logic built into the power supply/controller. This requires the purchase of all three components, the controller/power supply, the light source array and the receiver array. A system that incorporates the microprocessor and logic necessary to function built into the arrays is a more effective setup. In some cases, only the light source and receiver arrays need to be purchased.



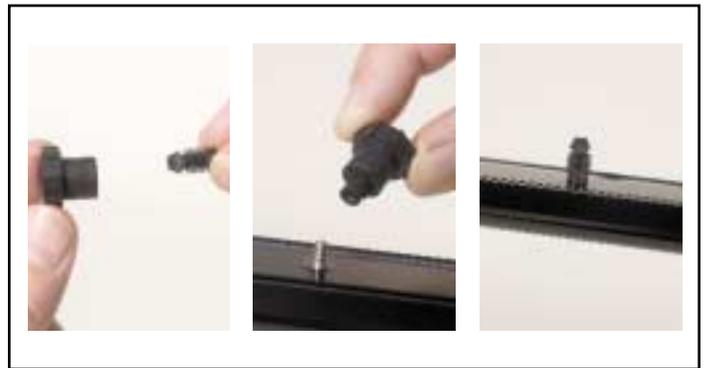
Center-opening door installation



Side-parting door installation

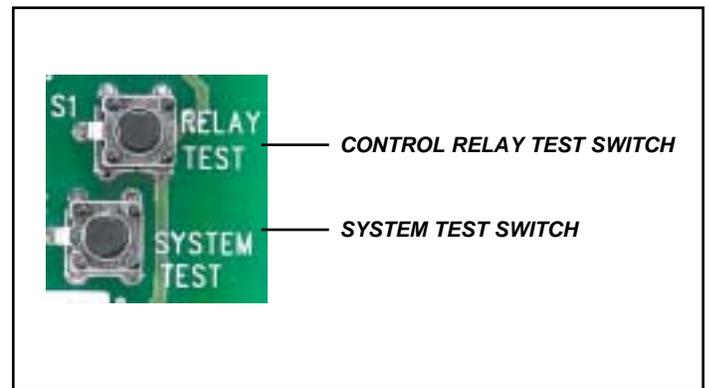
Simplifying Installation

Low-cost light-screen door controls are often the most difficult to install. If they take longer to install, the initial cost savings of the equipment can quickly disappear and additional costs could incur. The Tri-Tronics system is easier and quicker to install. Threaded studs and brackets are used on the doors. For mounting the arrays on difficult door jams, nylon adapters that screw onto the studs are provided. Push-in nylon fasteners then make it easy to mount on the jam by simply drilling holes.



Easy push-in fastener array installation

The control board includes array connections that are interchangeable and short-circuit protected. It also includes a *System Test* button to simulate a beam break for a complete system test and a *Control Relay Test* button. As a result, Leading Edge installation can be



Simple two-button diagnostics

accomplished by a "single installer," and the entire system can easily be tested from the top of the cab.

Simplifying Diagnostics

Most light-screen door controls include a full complement of LED indicators on both the receiver and light source arrays that are useful for troubleshooting problems. All that is required to test The Leading Edge system is the use of the relay and system test buttons on the control board while monitoring the response of the system.

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If the output control relay does not energize when depressing the Control Relay Test button, the problem is most likely the control circuit board. If the relay energizes and the door does not close, the problem could be faulty control relay contacts or failure of the door operating system itself.

If the system does not respond properly when depressing the System Test button, the problem is with one of the arrays. Monitoring the LEDs on the arrays will reveal which one is faulty.

Enhancing Appearance

The interior appearance of the elevator has become a more important issue with today's new building and renovation designers. The Leading Edge offers arrays in a choice of conventional black, brilliant silver or gold to enhance any elevator decor.

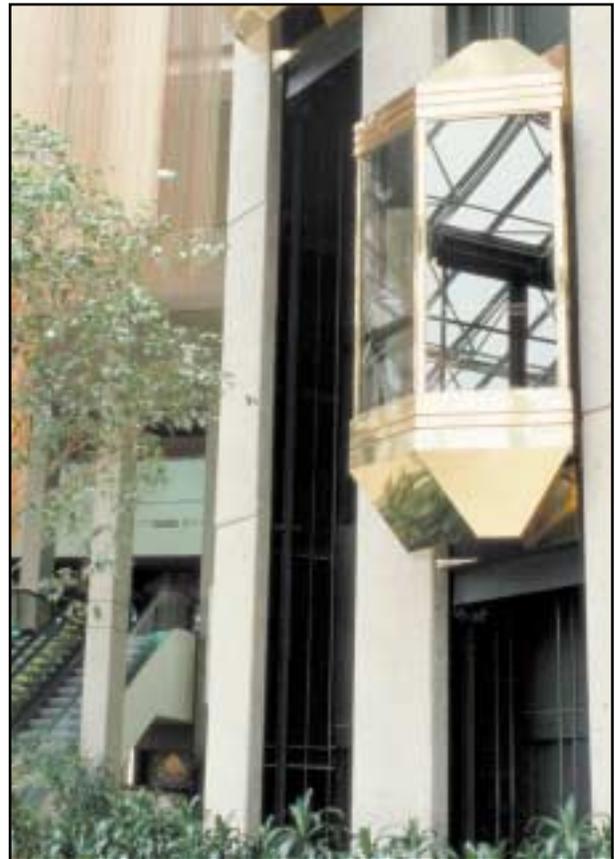
Lowest Applied Cost

In the selection of elevator door controls, a system that incorporates low initial purchase price and installation costs and high reliability is of paramount importance.

Robert A. Warner has been instrumental in the design, development and manufacture of photoelectric sensing devices since 1969. He served as part owner and vice president of Unidyne during the 1970s. When Tri-Tronics purchased Unidyne in 1976, Warner served as senior vice president of Product Development. He has continued in the innovative development of photoelectric elevator door products for the past 17 years.



Wide beam optics works on round elevator doors



Eliminates ambient light problems



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