The GATEKEEPER
Man - Machine Safeguarding News from SCHMERSAL

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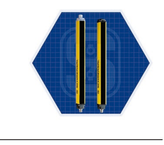
Machine Safeguarding Solutions: Safety Light Curtains

Hard guards are often the first types of guarding looked into when attempting to safeguard personnel from machines or hazardous areas. However, there may be certain applications where hard guards cannot be applied or may not be the best solution. For example, feeding a part into a system at a high demand rate while utilizing a movable guard can cause an ergonomic hazard since the guard has to be repeatedly opened and closed to load and remove a part. Or you may have a fully automated application such as a robot palletizer where large pallets need to move in and out of a hazard area while at the same time prevent someone from walking into the robotic cell. It may not be technically feasible to install a large automated door to constantly open and close to allow the safe movement of pallets. In applications such as these a safety light curtain can be used.

A safety light curtain is a presence sensing device (PSD) that consists of an emitter and a receiver. The emitter sends an array of infrared beams to the receiver which is monitored to assure that a defined field remains uninterrupted. If the infrared field is interrupted, a stop function is initiated and the equipment is placed into an interlock state removing any hazardous situations and preventing a machine cycle. A defined field of arrays can represent the monitoring of the opening for a walkway, a point of operation, or an area around a machine.



Certain special functions can be applied to the safety light curtain to allow them to be used in complex applications. For example, the function of muting will allow the infrared beams of a light curtain to be interrupted by material automatically entering or exiting a hazardous area but will not shut off the safety outputs or the machines inside this hazardous area. This is accomplished by the safety light curtains monitoring a set of muting sensors which must be interrupted in specific sequence by the moving material, allowing the temporary muting of the monitored infrared array. The muting sensors are installed such that a human cannot physically interrupt the muting sensors in the correct pattern to initiate a mute, thus every time personnel interrupts the beams of the safety light curtain, a stop function is always initiated for the hazardous area.

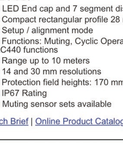
One thing that must be taken into consideration when using a safety device such as a light curtain is the stop time of the safety function and equipment. This is due to the fact that there is no physical barrier or anything stopping someone from reaching or walking through the infrared beams. A stop time analysis must be performed so that a minimum safe distance calculation can be conducted to determine where the safety light curtains can be installed in relation to the hazard. Since the hazards can be approached at any given time, the minimum safe distance calculation will ensure that all hazardous conditions are removed between the time the light curtain is interrupted to the time personnel reaches the hazard.

Related products

SLC440COM

- LED End cap
- Compact rectangular profile 28 mm x 33 mm
- Setup / alignment mode
- Start/restart interlock
- Range up to 10 meters
- 14, 30, 35 mm resolutions
- Protection field heights: 330 mm to 1930 mm
- IP67 Rating

Tech Brief | Online Product Catalog



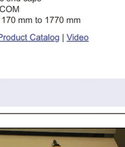
SLC440

- LED End cap and 7 segment display
- Compact rectangular profile 28 mm x 33 mm
- Setup / alignment mode
- Functions: start/restart interlock, fixed or floating blanking, EDM contactor control, double reset/acknowledgement, beam coding
- Range up to 10 meters
- 14 and 30 mm resolutions
- Protection field heights: 170 mm to 1930 mm
- IP67 Rating

Tech Brief | Online Product Catalog | Video

SLC445

- LED End cap and 7 segment display
- Compact rectangular profile 28 mm x 33 mm
- Setup / alignment mode
- Functions: Muting, Cyclic Operation, Muti-scan, plus all SLC440 functions
- Range up to 10 meters
- 14 and 30 mm resolutions
- Protection field heights: 170 mm to 1770 mm
- IP67 Rating
- Muting sensor sets available



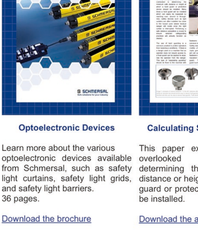
Tech Brief | Online Product Catalog | Innovations

SLC440 IP69

- IP69 rated housing for wash down applications
- Round polycarbonate profile, 50 mm dia.
- Prewired cable with connector
- Stainless Steel or plastic end caps
- For SLC440 or SLC440COM
- Protection field heights: 170 mm to 1770 mm

SLC Accessories | Online Product Catalog | Video

Reference



Video: SLC440 Features Demo

Application Engineer Devin Murray explains the various features of the SLC440 Series of Safety Light Curtains, such as the 7 segment display and LED end cap signal.

View the video

Video: SLC440 Programming Demo

Application Engineer Devin Murray shows how easy it is to select and program the various integrated functions of the SLC440 Safety Light Curtain.

View the video

Optoelectronic Devices

Learn more about the various optoelectronic devices available from Schmersal; such as safety light curtains, safety light grids, and safety light barriers. 36 pages.

Download the brochure

Calculating Safety Distance

This paper explores the often overlooked practice of determining the minimum safe distance or height at which a hard guard or protective device should be installed.

Download the article

Safety Light Curtain Terms

A select glossary of common terms related to safety light curtains, such as AOPD, Resolution, OSSD, PSDI, Attenuation, Blanking, Muting, and Range.

Download the article

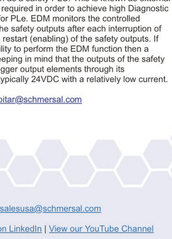
Machine Safety Webinar

Machine Guarding Technology

Many technologies evolve and advance over time, and machine safety technology is no different. The last few years have seen a rise in intelligence added to individual components. This can improve your safety levels, increase tamper resistance, and have more diagnostic capabilities - All of which results in increased machine up-time and longevity.

In this one hour machine safety webinar, Mike DeRosier reviews some of these technological advances and the reasons for them.

View the webinar



Ask The Expert

Rodrigo Bitar
TUV Functional Safety Engineer
ID-No. 10105/15

Q: Do Type 4 light curtains require a safety controller for Category 4 / PLe safety circuits?

A: When designing to a Category 3 circuit or above it is crucial for the output elements of the safety function, such as a machine control relay, to have feedback to the logic element, such as a safety PLC. This is known as external device monitoring, or EDM, and is required in order to achieve high Diagnostic Coverage which is a requirement for PLe. EDM monitors the controlled switching elements connected to the safety outputs after each interruption of the protection field and prior to the restart (enabling) of the safety outputs. If the Type 4 light curtain has the ability to perform the EDM function then a safety controller is not required; keeping in mind that the outputs of the safety light curtains will only be able to trigger output elements through its semiconductor outputs which are typically 24VDC with a relatively low current.

Have a question? Ask Rodrigo: rbitar@schmersal.com