Safety light curtain solutions for AS/RS

Muting and blanking strategies to maximize efficiency while safeguarding against hazardous motion

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Automated storage and retrieval systems (AS/RS) are widely used in manufacturing and distribution facilities to take the place of expansive shelving areas, which can hamper both space efficiency and productivity due to the large amounts of manual labor required. Although AS/RS systems improve safety overall by eliminating these manual activities, they still require safeguarding to ensure that a person does not access hazardous areas.

The main challenge in AS/RS safety — for which safety light curtains are a primary technology — is that the safety system needs to allow totes to enter the danger zone while keeping people out. In this white paper, we'll discuss specific muting and blanking strategies for maximizing efficiency and describe some unique features of Omron's light curtain technology that makes this process easier than ever.

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An overview of automated storage and retrieval systems

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AS/RS is designed to use space more efficiently. Light curtains ensure the right objects pass through safeguarded areas.

The goal of AS/RS is to use storage space more efficiently. In an AS/RS system, a tote or possibly an entire pallet will travel up an elevator to be stored within a very large assembly. Because the space is so tall and narrow, automation is a must. When totes need to be stacked vertically, a robotic machine will perform the stacking and send them along to the storage machine. There might be a conveyor leading up to the robotic stacker.

Each stack — or line — needs its own safeguarding to stop people (and possibly forklifts) from getting in, and safety light curtains are the preferred mechanism. With all the items being stored, there is a fair amount of activity going in and out of the system, meaning that both muting and blanking of the light curtains are likely necessary. These functions help ensure that the right objects pass through the light curtains' safeguarded area, while other objects (and people) do not.

Understanding the difference between muting and blanking

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Blanking and muting are related, but they are not the same thing. If you have a conveyor that requires safeguarding above and below, but you do not want the conveyor itself to trip the light curtain, you could make do with having two separate light curtains for each area. However, this would be less efficient than having a single light curtain with certain beams blanked out for the conveyor. Fixed blanking means that certain beams would need to always "see" the conveyor, or they will trip. The normal logic is flipped for those beams.

When you have an object that is supposed to temporarily pass through the light curtain without causing it to trip, then you can use a muting function. Muting sensors will sense the object's presence before it enters the safeguarded area, and they will then tell the light curtain not to trip. It is important to make the sensors correspond to the size of the expected object as closely as possible (or to the time it would likely take the object to pass through the beams).

"Blanking and muting are related, but they are not the same thing"

Muting vs. blanking summarized

Blanking means that the normal logic is flipped for certain beams, so they need to always sense an object's presence rather than its absence.

Muting means that a light curtain is temporarily prevented from tripping when an object is supposed to pass through it.

Omron's light curtain innovations that improve AS/RS safety

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Omron has been an innovator in the safety light curtain space for decades. To improve muting functionality, Omron light curtains offer a capability known as programmable muting. Rather than temporarily deactivating the entire curtain when input arrives from the muting sensors, this feature allows you to deactivate a specific part of the curtain. This helps ensure that only a truly tote-sized object will be allowed through the safeguarded space, since the other beams will detect anything that is larger.

Another major advantage of using Omron light curtain technology is the option to employ infinite muting, which no other automation companies currently provide. Infinite muting comes in handy in scenarios where objects are likely to come into the safeguarded area and sit there for several hours or even days. This is such a common

inconvenience in facilities that use AS/RS that it is often considered part of the job. Because it is important for the rest of the machine to continue working, you do not want the safety system to shut things down for every object that remains in the area for an extended period of time. If you can mute the light curtain indefinitely, then things can just sit there until you are ready to deal with them. Essentially, this solves a problem that has generally been considered to have no solution.

Finally, Omron provides a feature known as Intelligent Tap that significantly reduces the setup time for any applications involving blanking or muting. A device that fits in the palm of your hand, Intelligent Tap allows you to save all the configurations so that you can simply plug in the light curtains and have the correct configurations uploaded.

Unique capabilities of Omron light curtains

Improve muting and blanking with these powerful features.

Programmable muting lets you temporarily deactivate part of the light curtain rather than the entire thing.

Infinite muting makes it possible

for certain objects to sit within view of the light curtain for an extended period of time without tripping it.

Intelligent Tap lets you save light curtain configurations so that they will be automatically uploaded when you plug new curtains in.

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Summary

Learn more about Omron Solutions

The unique requirements of AS/RS safety necessitate more advanced safety light curtain functionality. Omron features such as programmable muting, infinite muting, and Intelligent Tap make safeguarding much easier to set up and more efficient to operate.

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Omron safety light curtain solutions ›

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