

Using smart muting functionality to increase safety and productivity while preventing unintended machine stops

Safety is a critical part of any automated manufacturing process... and so is productivity. In today's manufacturing environment, companies continue to seek more effective ways to protect workers, increase equipment life cycles and maintain stable operations.

Safety has historically been viewed as an impediment to continuous production. Even with management's best intentions in meeting OSHA's requirements to provide a safe workplace, workers still defeat many of these devices since they are perceived as slowing down the process.

Unstable conveying conditions such as high vibration and dusty environments interrupt the detection field, causing intermittent false tripping and shutting down production. The unexpected swaying of package movement within a detection field could cause production to come to a halt, resulting in the need for the package to be manually moved and the system reset before resuming. These unnecessary shutdowns could cost a manufacturer upward of tens of thousands of dollars and lead to preventable aggravation.

But over the past decade, technical developments in safety allow manufacturers to not only protect their employees more effectively, but also maintain stable operation and improve productivity.

Omron's next-generation F3SG-R Global Safety Light Curtains increase both safety and productivity

"When this particular customer first approached me about safeguarding their palletizing robots at their U.S. facility, I was interested to help them figure out what was causing the false trips," says Yuliya Fiorillo, Industry Account Manager for Omron Automation & Safety. The palletizing robots are handling pallets already packed with cartons and wrapped.

Yuliya, who has an extensive background working in safety, discovered the cause of the false tripping was the holes (entry chambers) on the side of the pallets. She immediately knew that by using the smart muting actuator, configured using chattering/void space prevention mode in conjunction with the off-delay function, would allow the customer to ignore the impact of large holes in the pallet.

After gaining a better understanding of the situation, Yuliya proposed an on-site demonstration of Omron's next-generation F3SG-R Global Safety Light Curtains. Yuliya worked closely with Richard Stein, Application Engineer for Omron Automation & Safety, to properly mount and program the Global Safety Light Curtains using the quick-mount adjustable bracket, which not only allows for vertical adjustment, but also for angle adjustment up to +/- 15°. The Global Safety Light Curtains are designed for easy installation – and with the integration of Omron's smart muting actuator, the customer was able to eliminate the 4 separate sensors that were installed under the conveyor as part of the previous supplier's solution.

■ Business Need

Implementing safety without falsely disrupting productivity is a critical part of the manufacturing process. Since safety historically has been viewed as an impediment to continuous production, components were mainly integrated as a necessity to meeting regulatory standards. But over the past decade, manufacturers have been calling for technical developments in safety that will allow them to not only protect their assets, but also maintain stable operation and improve productivity.

■ Unique Challenges

Omron's next-generation F3SG-R Global Safety Light Curtains with smart muting functionality are a more robust and reliable alternative to traditional light curtains. They are designed to accurately distinguish between packages and workers, preventing unintended machine stops.

■ Customer Benefits

With the F3SG-R Global Safety Light Curtains, Omron was able to provide a complete solution from assessment to installation and optical synchronization. The customer is able to protect their palletizing robot cells but also maintain stable operation and improve productivity. With Omron's multi-lingual support platform, the customer can implement a standardized solution worldwide.



Smart muting maximizes productivity in ways similar components cannot match

“The pallets coming off their conveyor are of various heights,” said Yuliya. “With older technology, varying package heights could create a potential issue distinguishing between workers and passing packages. And ultimately, that could lead to an issue with maintaining safety - without compromising productivity.”

The smart muting function is a new feature, using a dedicated actuator to monitor products and automatically suspend a portion of the light curtain’s beams during the non-hazardous portion of the machine cycle. This feature allows a package to pass through, while continuing to provide a safeguard for operators attempting to enter the hazardous area through the other zones. It optimizes performance for unstable conveyor conditions by adjusting its monitoring due to the product shifting or the conveyor stopping and keeps the process moving. Readjusting packages and resetting the system are now a thing of the past.

Set-up for changing part sizes is simplified as the F3SG-R Global Safety Light Curtains automatically measure the height of each package passing through and sets the muting zone, eliminating the need to set the zone in advance.

Special software records the muting status in the safety light curtains and analyzes the logged status to determine optimal settings. This minimizes the trial and error in adjustment, reducing adjustment time by up to 80%.

Making the transition

Once the IP67 rated light curtains were installed, the Omron team began the process of programming the Global Safety Light Curtains for dynamic exit-only muting with off-delay functionality. In addition, having optical synchronization eliminates the wiring between the emitter and the receiver once needed to synchronize the beams. It will hold synchronization if just one beam remains unblocked. Having IP67 rated Smartclick™ connectors also saved installation time.

Ease of installation was critical to this customer as they were looking to safeguard 30 palletizing robot cells within a 3-month period – and then replicate the project in their overseas facilities.

“They have factories located on 3 different continents and different local requirements to manage,” explained Stein. “The F3SG-R Global Safety Light Curtains are designed to follow international standards, allowing them to implement a standardized solution worldwide.”

Given the customer is a global company, having immediate access to manuals and troubleshooting tools in 8 languages furthered their ability to standardize safety in palletizing robot cells throughout all of their facilities. They found the QR code, which is applied directly to the associated machine and can be accessed via smartphone or tablet, would be beneficial to operators and MRO staff in the event changes needed to be made at the palletizing stage.

Omron Automation and Safety is a leading global provider of machine safety and automation solutions, with more than 80 years of service experience in the controls and sensing business. Our customers can rest assured the automation strategy developed will meet the needs of today and include pathways for practical expansion and modification to address the many challenges of the future.

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