

Intuitive Safety: How Integrated Visual Management and Remote Monitoring Demystify Machine Safety



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Please note, the following article is for educational purposes only and is accurate as of the time of publication. We recommend discussing your specific application requirements with a safety expert.

Safeguarding machines and personnel is critical to ensuring smooth operation of any manufacturing facility. Effective machine safety systems benefit workers, manufacturers, and employers by reducing lost work days due to injury, reducing liability for employers, and demonstrating employer's compliance with safety standards to appropriate regulatory agencies. Additionally, OEMs who integrate safeguarding into their machines enjoy a ready market for their easy-to-use, pre-integrated machines. However, machine safety can be complicated and difficult to manage.

This article shares common challenges for machine safety, and shows how combining easy-to-use safety devices with visual indication and remote monitoring capabilities can help make safety simpler and more effective.

Common Safety Challenges

For machine builders and end users alike, machine safety can be daunting, and many safety devices are cumbersome and difficult to use effectively without impacting productivity. Hard guards, such as doors, fences, and other fixed barriers, can reduce ergonomics, take up valuable floor space, and can be difficult to move in response to change. While hard guarding may be necessary for some applications, many applications can benefit from electronic safety devices, including optical devices like safety light curtains and safety laser scanners. These electronic devices offer many benefits including saving floor space and increasing productivity by improving workstation ergonomics.

However, even with the use of electronic safety devices, there are still challenges. Many electronic safety devices can be difficult to setup and use, and some require complex programming. In addition, once safety devices are implemented, they must be used correctly to ensure reliable safety, and they should be easy for operators to interact with—and not just for ergonomics. For example, it can be challenging for managers to quickly identify when and where a device has been tripped, which means it can take time to get the line back up and running after an event. Furthermore, safety systems that are difficult to use can make it more likely for operators to try to bypass the system, increasing the risk of injury and extended downtime.

Safety Simplified: 3 Important Considerations

Despite the complexities of industrial safety systems, safety *can* be more intuitive. The key is to find solutions that are easy to setup and use correctly and that allow operators to seamlessly interact with the devices. An intuitive safety system combines easy-to-use safety devices with LED indicators that can work together to make managing complex safety systems simpler and more visual.

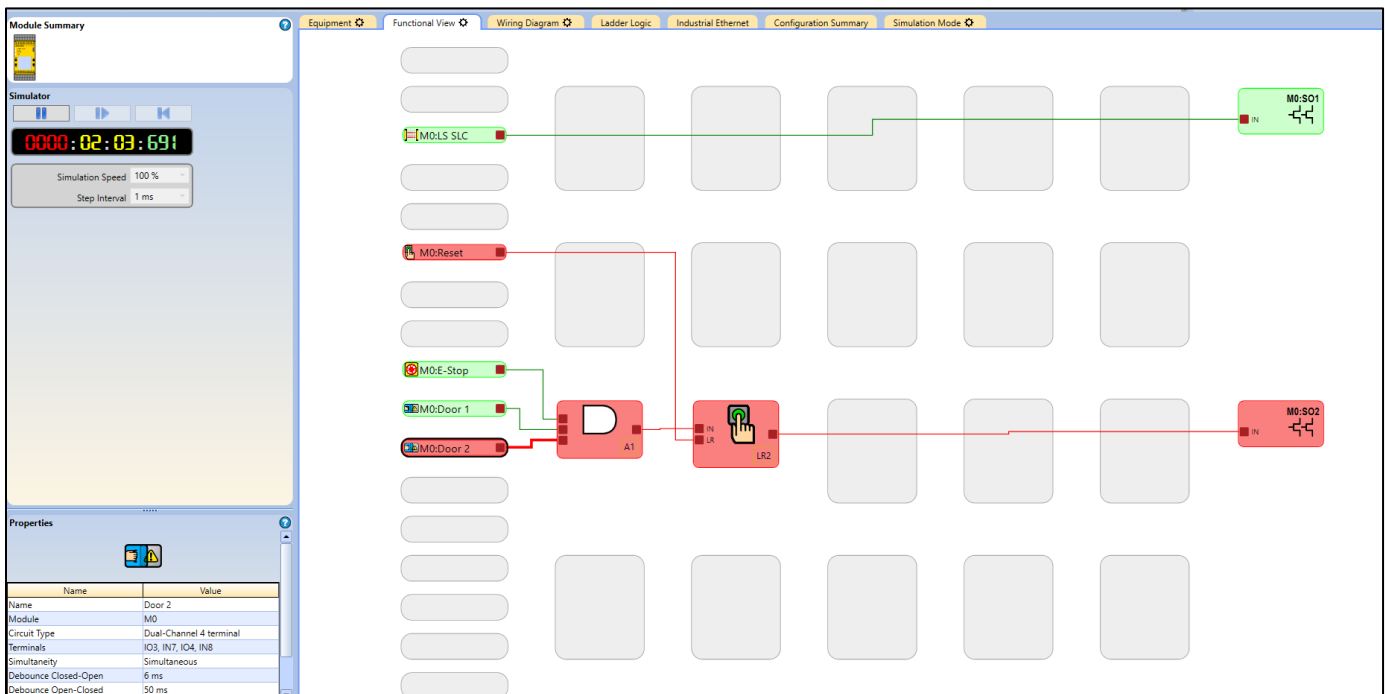
The following are 3 considerations to keep in mind when choosing a safety system for effectiveness and ease of use.

1. Simple Commissioning

The first question to consider when choosing a safety solution is whether the safety devices can be commissioned easily, cost-effectively, and with minimal downtime. In the case of safety light curtains, products that have visible alignment aids ensure that the light curtain can be set up both quickly and correctly. For example, the [LS safety light curtain from Banner](#) has alignment indicators built into the entire length of the receiver window for instant feedback during initial setup and future maintenance. When an area of the sensor is not aligned properly, or the window needs cleaning, the green lights will turn red in the affected area, making troubleshooting intuitive and expediting corrective measures.

For safety controllers, choose a device and software that feature an icon-based, drag-and-drop user interface to reduce the learning curve and speed up commissioning. For example, the [XS26 expandable safety controller from Banner](#) includes software with a seamless user interface for setting up and managing safety systems. In addition, the software's simulation mode allows users to quickly test new configurations and changes prior to implementation. (Note that simulations do not replace commissioning checkout procedures on installed systems. Always follow required procedures for installed systems detailed in the product instruction manual). The XS also has a built-in display and a micro USB connection to easily connect a PC or download a configuration from the XM memory card.

These seemingly small details will help get your safety devices up and running with minimal downtime, saving upfront time and costs.



The XS26 safety controller's icon-based, drag-and-drop user interface makes it easy to setup safety systems in minutes

2. Usability and Management

Easy setup is not the only important consideration. Safety solutions can be expensive and will be used for years to come. Because of this, an important factor to consider when choosing a safety solution is whether these safety devices are easy for operators to use, understand, and respond to quickly every day, year in and year out.

Safety devices with integrated visual management can make a significant impact on usability and therefore productivity. Furthermore, operators may also be less likely to attempt to bypass safety measures when the devices are easy to understand and interact with.



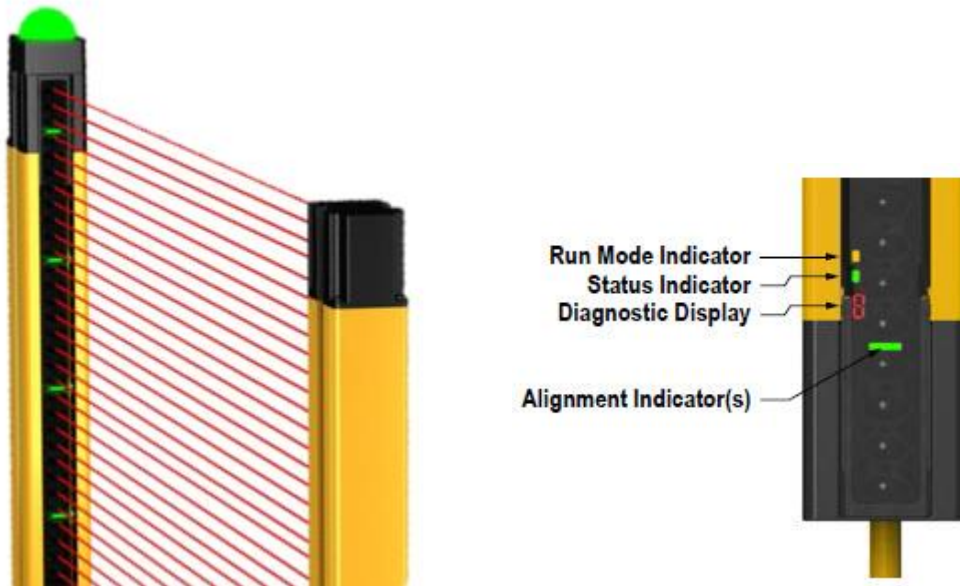
Illuminated emergency stop buttons make it easy to identify a pushed button

For example, with traditional e-stops, it can be time-consuming to determine exactly which button was pressed, and typically an emergency stop condition requires a reset of all e-stop buttons on a line. To solve this challenge, [illuminated e-stops](#) have an LED base that can be configured to change from yellow to flashing red when pushed. The colored lights in the e-stop base provide easy visual indication of armed button, pushed button, or system status.

This makes it easy to quickly see the status of all estops at a glance and instantly identify an actuated button. The faster the response to the stop condition, the more quickly the machine can be restarted, reducing unplanned downtime. Illuminated e-stops can also reduce commissioning time and costs due to the ability to series connect the e-stops to a safety controller. This not only reduces cable costs and wiring time, but also reduces the number of inputs used at the safety controller.

Another way to combine indication and safety is to add LED indicators to safety light curtains. Like the illuminated e-stop, these indicators provide clear, understandable local alerts so that operators can quickly identify when a safety light curtain has been tripped, facilitating faster reset. Banner Engineering's patented, field-installable indicators can be easily attached to cascadable models of the LS light curtain series with no wiring required, and they can be added on to the system at any time.

In addition to local indication, remote indicators can also help support productivity by making light curtain status visible from anywhere in the factory. For example, an LS light curtain can be connected to a remote tower light using a proprietary QD connection to ensure that machine safety status alerts are visible in the sightlines of a manager at their desk away from the machine. Choosing a solution provider that can bundle safety and indication solutions together can reduce the costs of installation and reduce wiring requirements.



Status and alignment indicators make safety light curtains easier to commission and operate

3. Remote Monitoring

A final consideration when choosing a more intuitive safety system is remote monitoring capability. As businesses convert from digital to IIoT technologies, remote access to devices throughout a manufacturing facility is becoming more important for maintaining flexibility and visibility, and safety is no exception. Remote access to the operational status of machine safety components allows plant managers to monitor and diagnose systems quickly before problems impact machine availability and productivity.

For example, a safety controller that can communicate with the PLC allows users to remotely monitor safety devices to quickly identify faults or actuated safety devices remotely via the HMI. Users can also track device data over time for predictive analytics and process optimization. For example, [XS26 and SC26 safety controllers](#) can communicate via Profinet, Ethernet/IP, Modbus, and PCCC up to 256 virtual status updates to a PLC and/or HMI that can be stored and tracked for future analysis. Furthermore, these controllers can also receive up to 80 virtual non-safety inputs to remotely turn safety devices or indicators on and off, enable mute functions, cancel off-delays, initiate a reset, and accomplish other tasks quickly and easily in the HMI without complicated programming.

Conclusion

The benefits of intuitive safety systems are many. When devices are easy to set up and use correctly, they are more effective. Furthermore, when safety systems are managed visually and can be monitored remotely, problems can be addressed more quickly, reducing unplanned downtime and saving costs.

[Contact us for more information about intuitive safety](#) or to discuss your application with an expert.