

What is External Device Monitoring (EDM)?

In safety systems that include a safety relay (mechanically linked/force-guided relay/contactors) that is not self-monitoring, it is necessary to monitor that relay externally. This is known as External Device Monitoring (EDM).

It is strongly recommended that a normally closed, forced-guided monitoring contact from each of two relays/contactors be connected to the EDM input(s). If this is done, proper operation will be verified. Monitoring these contacts is one method of maintaining control reliability (OSHA/ANSI) and Category 3 and 4 (ISO 13849-1).

External device monitoring (EDM) is a means by which a safety device (such as a safety light curtain) actively monitors the state (or status) of external devices that are controlled by the safety device. A lockout of the safety device will result if an unsafe state is detected in the external device. External device(s) may include, but are not limited to: MPCEs, captive contact relays/contactors, and safety modules.

External device monitoring is necessary in safety systems with a non-self-monitoring safety relay. This is achieved by:

- Understanding the device that needs to be monitored
- Selecting a safety device that contains EDM functionality
- Configuring and wiring your device through EDM

EDM requires the use of mechanically linked/force-guided relays/contactors with a normally closed (NC) contact for feedback monitoring. This increases the overall safety of the system by providing an extra layer of protection against potential failures of external components.

Understanding the Device

External Device Monitoring (EDM) works by having a host device with EDM connected to another device that cannot monitor itself.

When connected, the host device monitors the electric signals that are either generated by itself or an external 24 V supply. The host device ensures that the EDM input is high before it allows its output to turn on. The host device ensures the EDM input returns to a high state within 250 ms of its output turning off. By monitoring these states, the host device ensures that the devices being monitored have not failed in an ON state.

When the monitored device faults, a contact is welded in the on state, causing the NC contact to stay open. The host fails to receive its current, which flags that something in the monitored device has occurred.

Devices in a safety monitoring system have three options:

- Device can monitor itself, but does not have EDM capability
- Device can monitor itself and has EDM capability
- Device cannot monitor itself and does not have EDM capability

Selecting a Safety Device with EDM

The following is a synopsis of Banner products and whether or not they include EDM abilities.

Refer to the following list of products to determine if your device has EDM capabilities.

These are not exhaustive lists. There may be other safety devices that can monitor or need monitoring. Always consult the user manual for your device to determine if it features EDM or requires a device with EDM.

EZ-SCREEN Safety Light Curtain models

EZ-SCREEN Family	Has EDM?	Notes
EZ-SCREEN S4B Safety Light Curtain	Yes	Requires the 8-pin cable model and a BC-M12F8-24-x or BC-M12F8-M12M8-23-x cordset, where the 'x' refers to the cordset length
EZ-SCREEN LP Low-Profile Safety Light Curtain	Yes	Requires the 8-pin cable model and a BC-M12F8-24-x or BC-M12F8-M12M8-23-x cordset, where the 'x' refers to the cordset length
EZ-SCREEN LP Basic Low-Profile Safety Light Curtain	No	
EZ-SCREEN LS Safety Light Curtain	Yes	Requires the 8-pin cable model and a BC-M12F8-24-x or BC-M12F8-M12M8-23-x cordset, where the 'x' refers to the cordset length
EZ-SCREEN LS Safety Light Curtain, the IP69K model	Yes	
EZ-SCREEN Type 4 Safety Light Curtain	Yes	All 8-pin models

Safety Controller models

Safety Controller Models	Has EDM?	Notes
SC10 Safety Controller	Yes	Configurable
SC26 Safety Controller	Yes	Configurable

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Safety Controller Models	Has EDM?	Notes
XS26 Safety Controller	Yes	Configurable

Safety Module models

Safety Module Models	Has EDM?	Notes
UM Series Universal Module	Yes	
IM-T Series Interface Module	No	This device needs to be monitored
SR-IM Series Interface Module	No	This device needs to be monitored
ES Senries Emergency Stop and GM Series Guard Module	Yes	

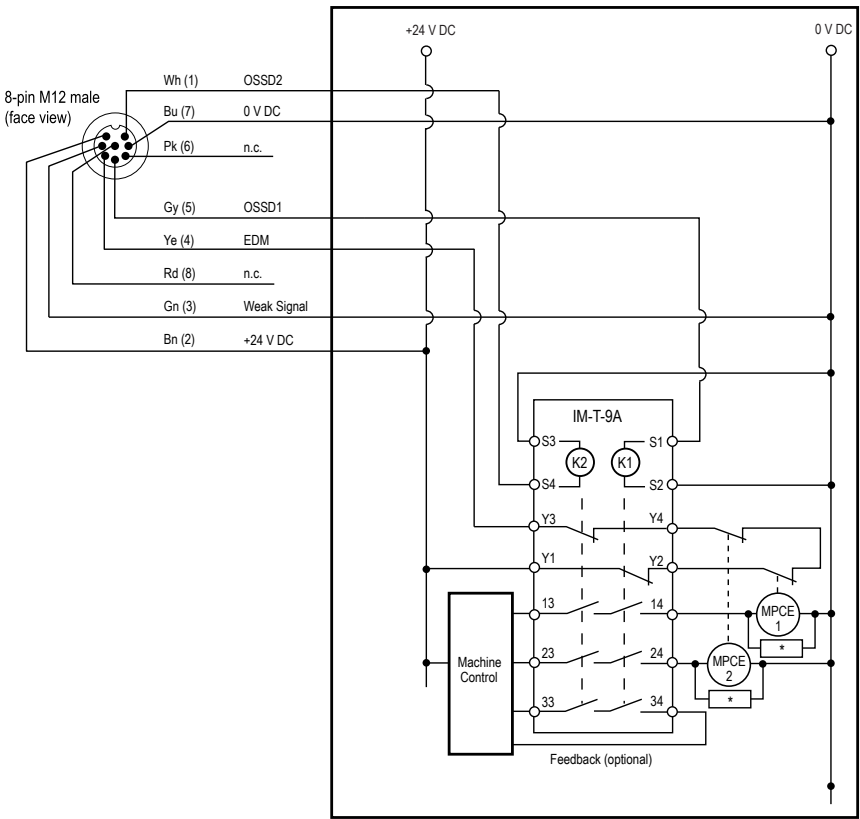
Configuring and Wiring a Device with EDM

The following example shows a general wiring of a light curtain to an IM module, including an EDM wiring option.

Locate the wiring diagrams for the host and/or monitored device.

For this example, the host device is an EZ-SCREEN S4B Light Curtain (product manual p/n [230287](#)) with an 8-pin removable disconnect wired to an IM-T-9A Interface Module (product manual p/n [62822](#)).

Generic Wiring Diagram—IM-T-9A Interface Module (1-Channel EDM)



In this case, the yellow wire from the host device is used for monitoring the IM-T-9A K2 contact by connecting your wire to Y3. A jumper wire is then used from Y4 to Y2 on the IM-T-9A, which uses the same EDM wire to monitor the K1 contact when Y1 is connected to +24V. This jumper wire can also be used to monitor other devices, shown as Machine Primary Control Elements (MPCE).