

# Vital Controller

## Inspired by industry standards

The Vital Controller was developed to address the shortcomings of safety relay technology, reduce the need for multiple safety relays, and offer an enhanced level of safety that conventional safety relays cannot. Using our proprietary dynamic pulse technology, Vital can accommodate up to 30 safety devices, detect faults at the time of occurrence, and meet the highest level<sup>®</sup> of safety.

## Unparalleled value

- Immediate detection of shorts enhances safety level.
- Vital offers not just control reliability, but product reliability as well, which will keep your machines running.
- Vital reduces installation time and labor costs.
- Reduces wiring points by employing dynamic pulse technology.
- 22.5mm width saves panel space.
- Built-in LED diagnostics reduce downtime when troubleshooting.
- Up to 75% less components needed to achieve the higher levels of safety.
- Universal capabilities—one controller, many solutions—bypassing, safety mats, light curtains, e-stops, door sensors, roller doors.
- Unlike safety relays, faults cannot be masked with Vital.

## Unique design

- Monitors up to 30 devices in series while maintaining the highest level\* of safety.
- Vital comes standard with LEDs and output for diagnostics.
- Offers immediate detection of faults in the Vital safety circuit—saving hours of troubleshooting.
- Dynamic pulse technology allows for single channel wiring eliminating nearly 50% of wiring points compared to conventional dual channel systems.
- Cycling power, replacing the controller, or opening other devices will not fool the Vital.



## Increase profits by reducing downtime

LEDs, standard on every Vital, makes set up and troubleshooting quick and easy, unlike conventional systems without any visual indication. Without this feature, common system faults—due to vibration, misalignment and single channel safety faults—can be a mystery to diagnose until safety devices are individually cycled and tested, resulting in extended downtime.



## VITAL DIAGNOSTICS' LED allows for immediate diagnosis and reset.

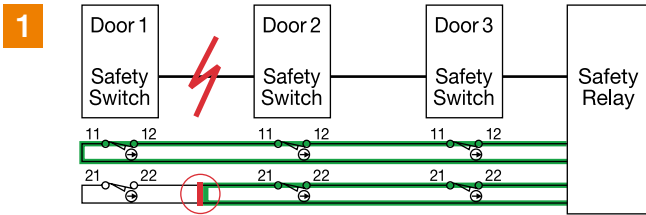
**Green LED:** Door closed = device closed and entire circuit up to this point is satisfied.

**Red LED:** Door opened = device opened or door out of alignment.

**Flashing Green/Red LED:** Door closed, but door located before it is open.

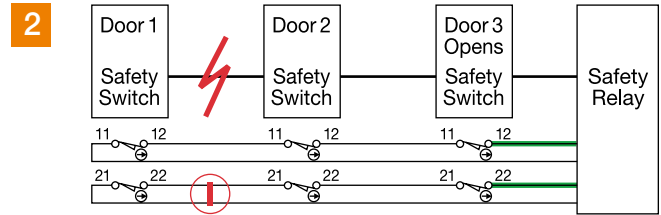
# Increase machine reliability and safety with Vital controller

When designing control reliable circuits, the drawbacks of safety relay technology limit the number of safety devices that can be utilized in a circuit. Dual channel safety relays can, under certain conditions, allow a fault to go undetected. The example below shows a simple safety relay circuit, using three mechanical interlock switches wired in series to a safety relay. A short occurs between two doors. The safety relay does not detect the fault until a door is opened. However, if a door earlier in the circuit is cycled or the systems restarted, the fault will be cleared but the short will still exist. The machine can then be restarted.



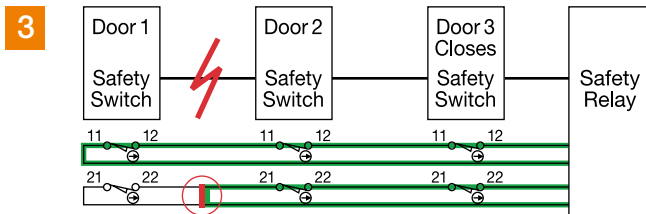
With a safety relay solution, a short across one of the channels can occur and will not be detected by the safety relay.

**THE FAULT IS UNDETECTED.  
MACHINE IS RUNNING**



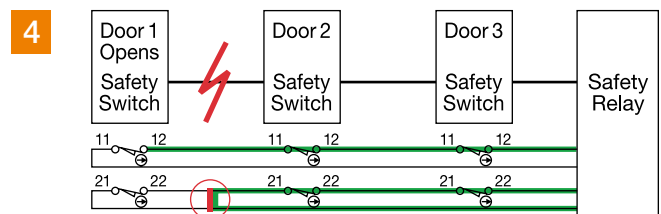
Any of the doors before the short can be opened and will stop the machine. The safety relay will see both channels change state.

**THE FAULT IS UNDETECTED.  
MACHINE STOPS**



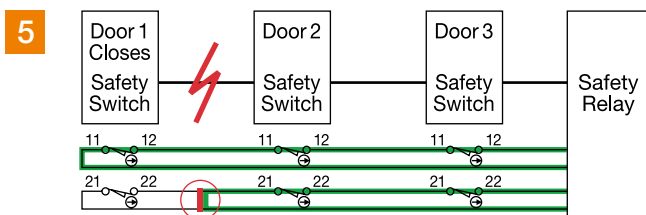
Door 2 or Door 3 can now be closed and the safety relay can be reset.

**THE FAULT IS UNDETECTED.  
MACHINE IS RUNNING**



When Door 1 is opened the safety relay sees only a single channel change state but still stops the machine.

**THE FAULT IS FINALLY DETECTED.  
MACHINE STOPS**



When Door 1 is closed, the safety relay will now enter a single channel fault and does not allow for a simple reset.

**NOW THE TROUBLESHOOTING BEGINS...**

## Troubleshooting techniques for safety relay technology

- **Cycle power**—Once power is cycled, the safety relay can be reset. The fault is still there and the door is a single channel circuit.
- **Replace the safety relay**—Same result as cycling power.
- **Open and close other doors**—This will clear the single channel fault and allow a reset. The fault is still there and the door is a single channel circuit.

Note: To convert conventional Light Curtains, E-Stops, Safety Mats, etc. into the Vital circuit, Tina Adapters are needed. See the Tina Safety Facts for more information.

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