The GATEKEEPER

SCHMERSAL
TURNING WORKPLACES INTO SAFEPLACES

January 2012

CONTENTS

REFERENCE

GK-1 Catalog

Our recently updated main catalog containing technical data sheets for all products.

View the catalog online:
www.schmersalusa.com

MRL News book
This book is designed to provide background knowledge and additional information on the subject of machine safety, as well

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Pulse Echo Technology
Maximizes Machine Safety

Electromechanical switches are commonly used in applications to interlock a machine to prevent an unintended startup of a hazardous situation while a door or gate is open. Depending on the Performance Level or Safety Integrity Level required, a single entry point may require multiple switches.

On larger applications with multiple entry points, it may be preferred to have diagnostic signals from the switches sent back to a centralized PLC to easily identify faults and reduce downtime. The downside of using such technologies may be seen in the wiring labor and costs. Wiring each switch from the guarded area to the safety and non-safe (diagnostic) controls has the ability to complicate any installation.

Schmersal has developed and patented a proprietary technology known as Pulse-Echo. Sensors with this technology will evaluate the predetermined frequency of the actuator which is emitted after it has been triggered by an electromagnetic pulse. This operating principle allows for a non-contact actuation and because of the dual monitoring microprocessor, only one switch is required to meet PLe per ISO 13849-1 and SIL3 per IEC 62061. In addition to the LED visualization located on the switch to indicate operating statuses and errors, each switch has a diagnostic cable with the option of communicating its status via serial data packages. Styles of the Pulse-Echo family include solenoid locking, magnetic locking and the IP69K rating just to name a few; all of which can be wired with up to 31 devices in series without degradation to the safety levels.

Pulse Echo Products

Pulse Echo technology has been applied a wide variety of switches:

CSS 180
Compact, threaded cylindrical sensor, which can be flush mounted
More»

CSS34
Rectangular sensor, actuation approach from any side or end
More»

VIDEO

Product Demonstration: Pulse Echo Technology
Watch as Sr. Application Engineer Dawn Etta explains pulse echo products and demonstrates serial diagnostic coverage

Go to Video

PRODUCT HIGHLIGHT

Serial Diagnostic Universal Gateway
Schmersal offers a Universal Gateway that will send individual switch status through a network for evaluation. Available protocols include PROFIBUS, PROFINET IO, EtherNet IP, DeviceNet, CC Link and CAN Open.

More info

CONTACT

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Schmersal USA

CSS 30S
IP69K rated Stainless Steel sensor for hygienic or outdoor applications
More»

AZ200/AZM200A
Keyed interlock switch w/a door handle actuator, available w/ solenoid latching (AZM200)
More»

MZM100 Magnetic locking switch with adjustable latching
More»

CSS16
The Pulse Echo sensing technology in our popular AZ16 housing.
More»

Innovations

Schmersal has applied Radio-frequency identification (RFID) technology in the new RSS36 series non-contact safety sensor. The RSS36 is designed for application in safety circuits monitoring the position of hinged, sliding or removable guards using a specifically coded, passive RFID tag in the actuator.

The clear advantage of using RFID technology is enhanced tamper resistance because the RSS36 has the option of individual coding: The basic version of the sensor responds to any RSS36 target actuator; one version only accepts the coded ID number of the specific target actuator which is taught in during the first start-up; Another allows the teach-in process to be repeated, allowing replacement of a lost or damaged actuator.

The RSS36 also features all of the diagnostic advantages of our Pulse Echo sensors: LED status indicators; serial diagnostics to communicate with various network protocols; and an integrated dual monitoring microprocessor – Allowing the RSS36 to be connected in series or in combination with pulse-echo sensors and locking switches, up to 31 devices while maintaining PLe per ISO 13849-1 and SIL3 per IEC 62061 requirements.

The RSS36 series is also ECOLAB tested and IP69K rated – making it ideal for the food processing industry and other applications where high-temperature high-pressure wash downs are experienced.

For more information see our Innovation article on **RFID technology**.

ASK THE EXPERT:

Mike DeRosier,
TUV Functional Safety Engineer

ID-No. 2872/10

Can E-stops buttons and other electromechanical switches be included in a series wired circuit and achieve Performance Level "e"?

There are many devices commercially available now which employ newer technologies that offer self diagnostics which allow them to be wired in series and still meet Control Category 4. However, Control Category 4 is only maintained when these types of switches are exclusively used in the series wired circuit. The inclusion of emergency stop buttons and other electromechanical switches would lower the Control Category.

There is a misconception that the only way to achieve PLe is with a Control Category 4 system, but it is possible to use a Control Category 3 circuit design and achieve PLe, because there are several factors that go into achieving a Performance Level to ISO13849. When all the factors are taken into consideration, a Performance Level "e" can be achieved with E-stop buttons and other electromechanical switches as a Control Category 3 - provided that switches with high MTTFd ratings are used in the Control Category 3 circuit and a medium to high diagnostic coverage is implemented.

For a more detailed explanation on this topic, see the technical article **"Using E-stop buttons and other electromechanical switches in a series wired circuit and Performance Levels achieved"** on our website.