

# Safety

## Safety Relays and Devices Maintenance and Troubleshooting Course Description

### COURSE AGENDA

#### Day 1

- Identifying Relay-Based Machine Functional Safety Systems and Components
- Maintaining Relay-Based Machine Functional Safety Systems
- Interpreting and Clearing Faults at the Safety Relay
- Interpreting and Clearing Faults for Wiring in Safety Systems

#### Day 2

- Interpreting and Clearing Faults for E-Stop Pushbuttons and Grip Enabling Switches
- Interpreting and Clearing Faults for Interlock and Non-Contact Switches
- Interpreting and Clearing Faults for Light Curtains and Safety Sensors
- Interpreting and Clearing Faults for Safety Mats
- Interpreting and Clearing Faults for Safety Outputs



### COURSE NUMBER: SAF-COM101

#### *Course Purpose*

This course will introduce you to monitoring safety relays and input and output devices used to configure safety systems according to industry standards for functional safety of machinery.

You will have the opportunity for hands-on experience with several of these components, which will help you to learn how they interact in safety systems.

After completing this course, you should be able to maintain and troubleshoot relay-based machine functional safety systems with the following devices:

- Monitoring Safety relays
- Operator interface devices (e-stop pushbutton and grip enabling switch)
- Electromechanical switches (interlock)
- Electronic switches (non-contact RFID interlock)
- Opto-electronic presence sensing devices (light curtain and safety sensor)
- A pressure sensing device (safety mat)

#### *Who Should Attend*

Individuals who maintain and troubleshoot electric circuits or machine systems and need to learn more about how to apply their skills to relay-based machine functional safety systems should attend this course.

### **Prerequisites**

To complete this course successfully, you must have experience:

- Interpreting industrial electrical circuit schematics
- Maintaining industrial electrical circuits or machine systems

### **Technology Requirements**

All technology is provided for student use in the classroom by Rockwell Automation. It is not necessary for students to bring any technology with them when attending this course.

### **Student Materials**

To enhance and facilitate your learning experience, the following materials are provided to each student as part of the course package:

- *Student Manual:*
  - Includes the key concepts, definitions, examples, and activities
- *Lab Book:*
  - Provides learning activities and hands-on practice
- *Troubleshooting Safety Systems Flowchart:*
  - Offers an overview of the decision-making process that can be used later on the job
- *Safety Relays and Devices Documentation Reference Guide:*
  - Contains frequently referenced technical documentation in a searchable, electronic resource

### **Hands-On Practice**

Throughout this course, you will have the opportunity to practice the skills you have learned through a variety of hands-on exercises:

- Exercises focus on the skills introduced in each lesson.
- Exercises are performed on a workstation with safety relays and devices.

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### **Next Learning Level**

Once you have mastered the skills covered in this course, you may want to attend the following course that focuses on the international standards used to design safety systems:

- *Functional Safety for Machinery Technician Certification (TÜV Rheinland)*  
(Course No. SAF-TUV0T)

### **Course Length**

This is a two-day course.

### **Course Number**

The course number is SAF-COM101.

### **IACET CEUs**

CEUs Awarded: 1.4



### **To Register**

To register for this or any other Rockwell Automation training course, contact your local authorized Allen-Bradley Distributor or your local Sales/Support office for a complete listing of courses, descriptions, prices, and schedules.

You can also access course information via the Web at <http://www.rockwellautomation.com/training>

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