



**AUTOMATION**

**COURSE MFG123**

## **Industrial Maintenance: Industrial Electrical Controls Fundamentals**

This course is designed to provide the knowledge and skills required to install, maintain, and troubleshoot machine controls.

At the completion of this course, you will be able to:

- Define the safety consideration that must be observed when installing, checking, or locking out electrical equipment
- Define uses and functions of input and output devices, relays, and motors
- Read schematic diagrams and logic
- Define an open and short condition
- Perform voltage and current measurements
- Demonstrate the proper use of the test equipment (VOM, DVM, multi-meters, continuity tester and amp probe) in lab to measure voltage, current, resistance, and continuity
- And more!

**Tuesday, April 16-  
Friday, April 19**

**8 AM - 5 PM**

**SMC Cape Girardeau  
2333 Rusmar St  
Cape Girardeau, MO**

**Cost: \$3,046**  
Includes Lunch



**Authorized  
Service Provider**

A ROCKWELL AUTOMATION PARTNER

To register, please contact Aislinn Roberts at [aroberts@smcelectric.com](mailto:aroberts@smcelectric.com)

# Course Agenda

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## DAY 1

- Electrical safety
- Electrical fundamentals
  - concepts and terms
  - sources of electricity
  - transformers
  - wiring devices
  - wiring standards
- Hands-on labs

## DAY 2

- Input devices
  - push buttons
  - limit, proximity, toggle, rotary switches
  - relays
- Output devices
  - motors
  - heaters
  - panel meters
  - light indicators
- Disconnect devices
  - fuses
  - circuit breakers
  - overloads
- Contactors
- Use of multimeter
- Hands-on labs

## DAY 3

- Logic devices
  - timers
  - counters
- Schematic diagrams
  - BOM
  - title blocks
  - basic schematic symbols
  - wire identification
- Logic Diagrams
  - switches
  - timers
  - relays
  - truth tables
- Ladder diagrams
  - rung identification
  - power rail identification
- Hands-on labs

## DAY 4

- Basic machine control systems
- Distribution
  - three-phase devices
- Build circuits
- Circuit troubleshooting
- Grounded and ungrounded control circuits
- Hands-on labs



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