



AUTOMATION | ELECTRICAL  
DATA COMM & SECURITY  
INDUSTRIAL & SAFETY  
FLUID POWER

## INDUSTRIAL AUTOMATION

TUES FEB 19 -  
FRI FEB 22  
8 AM - 5 PM

SMC JOPLIN  
923 W. 4TH ST.  
JOPLIN, MO 64801

# MFG 213 INDUSTRIAL MAINTENANCE - INDUSTRIAL ELECTRICAL CONTROLS FUNDAMENTALS

## TRAINING EVENT

This course is designed to provide 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 considerations that must be observed when installing, checking, or locking out electrical equipment
- Define uses and functions of input and output devices, relays, and motors
- Demonstrate the reading of schematic diagrams and logic
- Define an open and short condition and perform voltage and current measurements
- Demonstrate the proper use of the following test equipment in lab to measure voltage, current, resistance, and continuity: VOM, DVM, Multi-meters, continuity tester, and amp probe
- **And more!**



### + HANDS-ON

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

### COST

\$2,325  
Includes Lunch Each Day

### REGISTER

To register, contact Suzan Mcpherson at [smcpherson@smcelectric.com](mailto:smcpherson@smcelectric.com) by Tuesday, January 28, 2019.

## SCHEDULE

### Day 1

- Electrical Safety
- Electrical Fundamentals
  - o Fundamental concepts and terms
  - o Sources of electricity
  - o Transformers
  - o Wiring Devices
  - o Wiring Standards
- Hands-on lab

### Day 2

- Input Devices
  - o Push Buttons
  - o Limit, Proximity, Toggle,
- Rotary Switches
  - o Relays
- Output Devices
  - o Motors
  - o Heaters
  - o Panel Meters
  - o Light Indicators
- Disconnect Devices
  - o Fuses
  - o Circuit Breakers
  - o Overloads
- Contactors
- Use of Multimeter
- Hands-on lab

### Day 3

- Logic Devices
  - o Timers
  - o Counters
- Hands-on Lab
- Schematic Diagrams
  - o BOM
  - o Title blocks
  - o Basic Schematic Symbols
  - o Wire identification
- Logic Diagrams
  - o Switches
  - o Timers
  - o Relays
  - o Truth Tables
- Ladder Diagrams
  - o Rung Identification
  - o Power Rail Identification
- Hands-on lab

### Day 4

- Basic Machine Control Systems
- Distribution
  - o Three-Phase Devices
- Hands-on lab
- Build Circuits
- Circuit Troubleshooting
- Grounded and Ungrounded Control Circuits
- Hands-on lab