

Manufacturing

Industrial Electrical Controls Fundamentals Course Description

COURSE AGENDA

Day 1

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

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 lab

Day 3

- Logic Devices
 - Timers
 - Counters
- Hands-on Lab
- Schematic Diagrams
 - BOM
 - Title blocks
 - Basic Schematic Symbols
 - Wire identification



COURSE NUMBER: MFG213

Course Purpose

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
- Approximate secondary voltage, secondary current and primary current of a transformer when given its turns ratio, primary voltage and secondary load
- Identify the proper wiring configurations of a control transformer's primary current for 240V and 480V operation
- Approximate a transformer's maximum primary current for 480V operation, using the nameplate information

COURSE AGENDA

Day 3 continued

- Logic Diagrams
 - Switches
 - Timers
 - Relays
 - Truth Tables
- Ladder Diagrams
 - Rung Identification
 - Power Rail Identification
- Hands-on lab

Day 4

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

Who Should Attend

Individuals who are responsible to install, maintain and troubleshoot electromechanical machine controls should attend this course.

Prerequisites

To successfully complete this course, the following prerequisite is required:

- Familiar with basic electricity

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 as part of the course package:

- *Student Manual*, which contains the key concepts, definitions, and examples presented in the course and includes hands-on exercises.

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. These exercises focus on the skills introduced in each lesson.

To complete the exercises, you will use a basic electrical training workstation. Because the basic skills taught in the course apply to all electrical control applications, the hands-on exercises permit you to apply what you have learned in your workplace environment.

Course Length

This is a four-day course.

Course Number

The course number is MFG213.

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>

www.rockwellautomation.com

Power, Control and Information Solutions

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