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## PLC Training - Intermediate

Contact us Today for a FREE quotation to deliver this course at your company's location.

<https://www.electricityforum.com/onsite-training-rfq>

This Intermediate PLC Training course is designed to instruct electrical control professionals on how to successfully integrate a PLC into actual day-to-day industrial electrical processes. It not only deals with the hardware and software, but all the surrounding systems that must be compatible to achieve a safe and reliable control system. This course is designed for people who have previous experience in PLC programming and would like to improve their programming and troubleshooting skills.

You should already have taken the Introductory Programming Course or have real world experience before taking this course.

The Course is generic in nature and applies to all types and manufacturers.

PLC Training is also designed to help delegates keep abreast of the latest PLC technologies and techniques available in this area, this tutorial offers an excellent opportunity for delegates to ask specific questions and exchange ideas relating to their own applications.

This Intermediate PLC Training course is intended for experienced users and will give them greater knowledge of enhanced PLC functionality. The Programmable Logic Controller has

evolved over the years and this course will provide the information required to make knowledgeable decisions about PLC applications in their individual manufacturing environments and allow for students to make well-informed decisions about existing control applications and to determine what is required for future applications. This PLC training course will also allow students to determine if plant personnel are prepared to meet the new challenges of the ever-changing plant manufacturing environment or if personnel require additional training to meet these challenges.

## **LEARNING OBJECTIVES**

PLC Training is designed to instruct electrical control professionals on how to successfully integrate a PLC into actual day-to-day industrial electrical processes. It not only deals with the hardware and software, but all the surrounding systems that must be compatible to achieve a safe and reliable control system. This training is generic in nature and applies to all types and manufacturers.

## **WHO SHOULD ATTEND**

### **Who Should Attend:**

- PLC Engineering and design control personnel
- Electrical maintenance and technical services personnel
- Electrical engineering and design personnel
- Process and operations personnel
- Technical and process managers
- Electrical consulting engineers
- Electrical contractors

## **STUDENTS RECEIVE**

- 100-Page Digital PLC Handbook - Value \$20 (Details Below)

- 1.4 Continuing Education Unit (CEU) Credits
- A **FREE** Magazine Subscription (Value \$25)
- **\$100** Coupon Toward Any Future Electricity Forum Event (Restrictions Apply)
- Course Presentations In Paper Format

## **COURSE OUTLINE**

### **DAY ONE**

#### **Session 1: Introduction**

#### **Session 2: Two-State (on-off) Control**

- Logic circuits
- Relays
- Ladder Logic Diagrams
- Boolean Logic

#### **Session 3: Evolution of Logic Controllers**

- Early Non-programmable Logic Controllers
- The First PLCs

#### **Session 4: Introduction to Programmable Logic Controllers**

- PLC Architecture
- Addressing

- Programming Software

### **Session 5: Basic PLC Programming**

- Examine On, Examine Off and Coil Instructions
- Creating Logic Statements
- Internal Coils
- Timers
- Counters

### **Session 6: Selecting and Wiring Discrete Input and Output Modules**

- Discrete Input Modules
- Discrete Output Modules
- Special Function Modules
- Wiring Considerations

### **Session 7: Introduction to Analog Control**

- 0-5 Volt, 1-5 Volt Analog Control Systems
- 4-20 mA Loops
- Analog Instruments: Flow, Level, Pressure, Temperature

### **Session 8: Introduction to Analog Control**

- Analog Control With PLCs
- Analog Input and Output Modules
- Registers and Addressing
- Configuring Analog Modules

- Comparison Instructions
- PID Control
- Examples of Analog Control

### **Session 9: Selecting and Wiring Analog Input and Output Modules**

- Analog Input Modules
- Analog Output Modules
- Special Function Analog Modules
- Wiring Considerations

### **Session 10: CPUs (Central Processing Units)**

- Memory Architecture
- CPU Specifications
- Communication Ports
- Selecting the Right CPU

## **DAY TWO**

### **Session 11: PLC Power Supplies**

- Internal Versus External Power Supplies
- Calculating Power Requirements

### **Session 12: Advanced PLC Programming**

- Math Instructions
- PID Control
- Drum Instructions
- Stage and Sequential Instructions
- Moving Data
- Register Instructions: Shifting and Masking
- ASCII Instructions

### **Session 13: PLC Communications and SCADA Systems**

- Digital Communications
- Serial Communications
- Ethernet and TCP/IP
- Fiber Optic Communications
- Communications Protocols
- Using PLCs in SCADA Systems

### **Session 14: HMI (Human Machine Interfaces)**

- Introduction to HMIs
- Configuring Communications

### **Session 15: PAC (Programmable Automation) Controllers**

- Introduction to PAC Controllers
- Overview of Instruction Set

### **Session 16: Safety Critical PLCs**

- Introduction to Safety Critical Design
- SIL (Safety Integrity Levels)
- Safety Critical and Mission Critical PLCs
- ESD Design Considerations

### **Session 17: Other PLCs**

- PLCs of Various Manufacturers
- Nano PLCs

### **Session 18: Backing Up and Documenting The Project**

- Creating File Backups
- Printing the Program

### **Session 19: Protecting the Program**

- Password Protection
- Hardware Locking

### **Session 20: Putting it All Together**

- The Steps to Implementing a Complete PLC Project
- Commissioning

## **COURSE TIMETABLE**

**Both days:**

Start: 8:00 a.m.

Coffee Break: 10:00 a.m.

Lunch: 12:00 noon (not included with course)

Restart: 1:15 p.m.

Finish: 4:30 p.m.

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