

# ELECTRICAL & PLC TROUBLESHOOTING

“Diagnosing Electrical Faults and PLC Failures for Faster Maintenance Recovery”

## Schedule

| Date             | Venue      | Fees (Face-to-Face)   |
|------------------|------------|-----------------------|
| 03 – 04 Dec 2026 | Dubai, UAE | USD 1995 per delegate |

► Available delivery methods: Face-to-Face & Online Training

## Introduction

Unplanned equipment downtime caused by electrical faults or PLC failures can significantly disrupt industrial operations. Technicians and maintenance professionals must be equipped with the knowledge and practical skills to rapidly identify, isolate, and fix issues to ensure system reliability and reduce costs.

This intensive 2-day course delivers hands-on troubleshooting techniques for electrical systems and programmable logic controllers (PLCs). Participants will learn how to systematically diagnose faults, read electrical schematics, use diagnostic tools, and restore automation systems quickly and safely.

## Objectives

By the end of this course, participants will be able to:

- Interpret electrical and PLC diagrams to locate and analyze faults
- Apply structured troubleshooting procedures for common electrical issues
- Use multimeters, testers, and PLC diagnostic tools effectively
- Resolve hardware and logic errors in PLC-based control systems
- Enhance safety, reliability, and response time in electrical maintenance tasks

## Why Attend

- To reduce equipment downtime and improve maintenance response
- To gain practical troubleshooting techniques for electrical and automation systems
- To increase workplace safety and minimize risk of electrical hazards
- To bridge knowledge gaps in PLC logic and fault isolation
- To support industrial continuity through better fault management

## Target Audience

This program is designed for:

- Electrical and instrumentation technicians
- Maintenance and reliability engineers
- Automation specialists and control engineers
- Production supervisors and technical operators
- Professionals responsible for troubleshooting in plant environments

## Individual Benefits

Key competencies that will be developed include:

- Electrical fault diagnosis using real-world scenarios
- Troubleshooting I/O systems, sensors, and actuators
- Analyzing PLC programs and locating logic faults
- Safety practices in troubleshooting live systems
- Use of testing equipment in field applications

## Organizational Benefits

Upon completing the training course, participants will demonstrate:

- Faster fault diagnosis and reduced equipment downtime
- Improved operational safety and incident prevention
- Lower maintenance costs through efficient troubleshooting
- Better coordination between electrical and automation teams
- Enhanced overall equipment effectiveness (OEE)

## Instructional Methodology

The course follows a blended learning approach combining theory with practice:

- Strategy Briefings – Electrical and PLC system architecture and failure modes
- Case Studies – Industrial fault scenarios and repair timelines
- Workshops – Fault isolation exercises, wiring analysis, and logic debugging
- Peer Exchange – Lessons learned from participants' field troubleshooting
- Tools – Schematics, fault trees, multimeters, HMI/PLC simulators, and diagnostic checklists

Course Outline

Detailed 2-Day Course Outline

**Training Hours:** 7:30 AM – 3:30 PM **Daily Format:** 3–4 Learning Modules | Coffee breaks: 09:30 & 11:15 | Lunch Buffet: 01:00 – 02:00

Day 1: Electrical Systems Fault Diagnosis

- Module 1: Fundamentals of Electrical Troubleshooting (07:30 – 09:30) • Types of electrical faults (open, short, ground, overload) • Systematic troubleshooting approaches • Safety procedures and lockout/tagout
- Module 2: Reading and Interpreting Electrical Diagrams (09:45 – 11:15) • Schematic symbols, wiring layouts, and control logic • Power distribution and motor control circuits
- Module 3: Workshop – Fault Finding in Electrical Circuits (11:30 – 01:00) • Using multimeters and clamp meters • Diagnosing a simulated fault in a control panel
- Module 4: Preventive Maintenance and Root Cause Analysis (02:00 – 03:30) • Visual inspection, insulation testing, and common failure points • Case study: root cause analysis of an electrical breakdown

Day 2: PLC Troubleshooting and Control Systems

- Module 5: PLC Architecture and Signal Flow (07:30 – 09:30) • Inputs, outputs, CPU, and communication modules • Wiring practices and sensor/actuator connections
- Module 6: Troubleshooting PLC Hardware and Logic (09:45 – 11:15) • Status indicators, fault codes, and diagnostic tools • Ladder logic interpretation and program debugging
- Module 7: Workshop – PLC Fault Isolation (11:30 – 01:00) • Simulated I/O failure diagnosis using test software • Modifying ladder logic for troubleshooting
- Module 8: Final Review and Best Practices (02:00 – 03:30) • Troubleshooting checklist and response procedure • Group discussion on recurring issues and resolution plans

Certification

Participants will receive a Certificate of Completion in Electrical & PLC Troubleshooting, validating their practical capability in diagnosing and resolving electrical faults and PLC issues in industrial environments.

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