

Course No. 1156

PLC Programming Training Course

INSTRUMENTATION & CONTROL
INDUSTRIAL ENGINEERING, MAINTENANCE & OPERATIONS

DURATION

5 Days

DELIVERY

Classroom



Course Overview

The PLC Programming Training Course is a comprehensive professional development program designed to equip engineers, technicians, and industrial professionals with the knowledge and practical skills required to design, program, configure, troubleshoot, and maintain Programmable Logic Controller (PLC) systems used in modern industrial automation. As manufacturing facilities and critical infrastructure continue to embrace Industry 4.0, digital transformation, and smart manufacturing, PLC programming has become one of the most essential competencies for ensuring efficient, reliable, and safe industrial operations.

This course provides participants with a structured understanding of PLC architecture, hardware components, input and output modules, programming methodologies, industrial communication, control logic development, diagnostics, and system integration. Through practical exercises and real-world industrial scenarios, participants will learn how PLC systems automate production processes, improve operational efficiency, minimize downtime, and enhance equipment reliability across various industries.

Organizations operating in oil and gas, petrochemicals, power generation, manufacturing, utilities, water treatment, mining, pharmaceuticals, food processing, and other industrial sectors rely on PLC-based automation to improve productivity, optimize process control, maintain consistent product quality, and strengthen operational safety. This PLC Programming Training Course enables professionals to develop practical programming capabilities while supporting organizational objectives related to operational excellence, asset reliability, production efficiency, and continuous improvement.

Combining engineering principles with hands-on applications and industry best practices, this course prepares participants to develop, modify, test, and optimize PLC programs that support complex industrial processes. By the end of the program, participants will possess the confidence and technical competence to contribute effectively to automation projects, maintenance activities, system upgrades, and digital transformation initiatives within their organizations.

Objectives

- Analyze the architecture and operating principles of Programmable Logic Controller systems throughout the course.
- Develop PLC programs that meet operational and industrial automation requirements.
- Evaluate industrial control requirements and select appropriate PLC programming solutions.
- Apply ladder logic programming techniques to industrial automation applications.
- Design reliable PLC control programs for manufacturing and process industries.
- Improve troubleshooting capabilities for identifying and resolving PLC hardware and software faults.
- Strengthen knowledge of industrial input/output devices and control system integration.
- Implement effective testing, commissioning, and validation procedures for PLC applications.
- Assess PLC program performance and optimize control strategies for improved operational efficiency.
- Align PLC programming practices with industrial safety, reliability, quality, and operational standards.

Who Should Attend

This PLC Programming Training Course is designed for automation engineers, control engineers, electrical engineers, instrumentation engineers, maintenance engineers, process engineers, production engineers, reliability engineers, commissioning engineers, project engineers, and industrial systems specialists involved in designing, programming, operating, or maintaining automated industrial systems. It is equally valuable for electrical technicians, automation technicians, maintenance technicians, instrumentation technicians, and field service professionals seeking to enhance their PLC programming expertise.

The course is also suitable for engineering managers, maintenance managers, operations managers, production managers, plant managers, technical supervisors, automation supervisors, project leaders, industrial consultants, digital transformation specialists, and decision makers responsible for improving industrial automation, operational efficiency, and manufacturing performance.

Professionals working within government entities, ministries, public sector organizations, oil and gas

companies, petrochemical facilities, manufacturing plants, utility companies, power generation stations, water treatment facilities, mining operations, pharmaceutical manufacturers, food processing companies, engineering contractors, and large industrial organizations will gain practical skills that support automation initiatives, operational reliability, and sustainable business performance.

Learning Outcomes

- By the end of this PLC Programming Training Course, participants will be able to:
- Explain the architecture, components, and operating principles of PLC systems.
- Develop PLC programs using structured programming methodologies and ladder logic.
- Configure digital and analog input/output modules for industrial applications.
- Create control sequences for automated industrial equipment and production processes.
- Test, validate, and optimize PLC programs before commissioning.
- Diagnose and resolve PLC hardware, software, and communication faults efficiently.
- Integrate PLC systems with sensors, actuators, and industrial control devices.
- Apply industrial communication techniques for reliable automation system performance.
- Implement safe programming, maintenance, and troubleshooting practices.
- Develop practical solutions that improve automation performance, equipment reliability, and operational efficiency.

Course Outline

DAY 01

Fundamentals of PLC Systems and Industrial Automation

- Introduction to industrial automation and PLC applications
- PLC architecture, hardware components, and system configuration
- Digital and analog signals, input/output modules, and power supply systems
- PLC operating principles and scan cycle concepts

PRACTICAL APPLICATION

Configuring PLC hardware and exploring the programming environment

DAY 02

PLC Programming Fundamentals

- PLC programming languages and programming standards
- Ladder logic programming concepts and instruction sets
- Timers, counters, relays, internal memory, and control functions
- Developing control logic for industrial processes

PRACTICAL APPLICATION

Building and testing basic PLC programs

DAY 03

Advanced PLC Programming and Troubleshooting

- Advanced programming techniques and modular program design
- Sequential process control and industrial automation strategies
- PLC diagnostics, troubleshooting methods, and fault analysis
- Program optimization for improved system performance

PRACTICAL APPLICATION

Diagnosing faults and optimizing industrial PLC programs

DAY 04

PLC Integration and Industrial Communication

- Integration of PLC systems with industrial sensors and actuators
- Human-machine interface integration and supervisory control concepts
- Industrial communication networks and data exchange
- PLC system testing, commissioning, and maintenance best practices

PRACTICAL APPLICATION

Developing an integrated industrial automation solution

DAY 05

PLC Performance Optimization and Industrial Applications

- PLC maintenance strategies and lifecycle management
- Improving automation reliability, efficiency, and operational performance
- Safety considerations in PLC programming and industrial automation
- Best practices for documentation, program backup, and change management

FINAL WORKSHOP

Design, develop, test, troubleshoot, and present a complete PLC automation project with an implementation plan for deployment in an industrial environment.

Register or Request More Information

Course page: <https://quest-training.com/courses/plc-programming-training-course>

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