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Course Name

PLC Programming & Industrial Control Applications

Sector Name

Instrumentation & Controls

Document Type

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PLC Programming & Industrial Control Applications

Course Introduction

Programmable Logic Controllers are at the center of many industrial automation and control systems, but effective PLC programming requires more than creating individual logic instructions. Industrial applications depend on correctly translating operating requirements into reliable sequences, interlocks, permissive, alarms, equipment commands, and safe responses to abnormal conditions. Poorly structured logic can make systems difficult to operate, troubleshoot, and modify.

Boost Consulting & Training offers this course to develop practical PLC programming capability around real industrial control applications. Participants progress from PLC architecture and I/O interpretation to logic development, timers, counters, sequencing, equipment control, interlocks, alarms, and program troubleshooting. Practical activities focus on converting process and machine requirements into structured control logic and testing whether the resulting program behaves correctly under normal and abnormal conditions.

The **main concept of this course** is to transform industrial operating requirements into structured, testable, and reliable PLC control logic that performs correctly in real operating situations.

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Target Audience

- ✓ Instrumentation and control engineers
- ✓ Automation and electrical engineers
- ✓ PLC and control technicians
- ✓ Engineers involved in industrial control-system development and support

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Learning Objectives

- ✓ Explain PLC architecture, operating principles, and the program execution cycle.
- ✓ Interpret digital and analog I/O within industrial control applications.
- ✓ Develop structured PLC logic for common operating requirements.
- ✓ Apply timers, counters, comparison functions, and data-handling instructions.
- ✓ Build sequences, permissive, and interlocks for industrial equipment.
- ✓ Integrate analog process signals into PLC-based control applications.
- ✓ Diagnose common PLC logic, I/O, and sequencing problems.
- ✓ Develop and test a complete PLC control application based on operational requirements.

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Course Outline

✓ DAY 01

Building the PLC Control Foundation

Understanding PLC Architecture and Operation

- ✓ Examine CPU, memory, power supply, communication interfaces, and I/O architecture.
- ✓ Understand the PLC scan cycle and how input, logic, and output processing interact.
- ✓ Trace an industrial control command from field input through PLC logic to equipment response.

Working with Industrial I/O

- ✓ Distinguish digital and analog input and output applications.
- ✓ Interpret field-device states, signal types, addresses, and I/O assignments.
- ✓ Complete an I/O Mapping Exercise for an industrial control application.

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Course Outline

✓ DAY 02

Developing PLC Control Logic

Building Fundamental Logic

- ✓ Apply contacts, coils, latching, comparison, and logical functions.
- ✓ Translate operating descriptions into clear control conditions.
- ✓ Structure logic to improve readability, testing, and troubleshooting.

Applying Timers and Counters

- ✓ Use timing functions for delays, equipment sequencing, and operating conditions.
- ✓ Apply counters to production, cycle, and equipment applications.
- ✓ Complete a PLC Logic Challenge requiring multiple operating conditions and timed responses.

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Course Outline

✓ DAY 03

Controlling Industrial Sequences

Developing Sequential Control

- ✓ Break operating processes into defined states and transitions.
- ✓ Program start-up, normal operation, shutdown, and reset sequences.
- ✓ Handle sequence interruptions and unexpected operating conditions.

Engineering Permissive and Interlocks

- ✓ Distinguish permissive, interlocks, trips, and operating commands.
- ✓ Develop logic that prevents equipment operation when required conditions are not satisfied.
- ✓ Build an Industrial Equipment Control Sequence incorporating permissive and protective interlocks.

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Course Outline

✓ DAY 04

Integrating Process Signals and Operator Requirements

Using Analog Signals in PLC Applications

- ✓ Scale raw analog inputs into meaningful engineering values.
- ✓ Apply comparison, limit, and control logic to process measurements.
- ✓ Use analog information to trigger equipment actions and operating responses.

Managing Alarms and Operating States

- ✓ Develop alarm conditions from equipment and process information.
- ✓ Differentiate alarm, warning, trip, and status indications.
- ✓ Complete an Operating Scenario Simulation involving analog conditions, equipment states, alarms, and control responses.

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Course Outline

✓ DAY 05

Testing and Troubleshooting PLC Applications

Diagnosing PLC Control Problems

- ✓ Trace incorrect equipment behavior through inputs, program logic, and outputs.
- ✓ Identify problems caused by field signals, addressing, sequence conditions, timers, and program logic.
- ✓ Use online program information systematically instead of changing logic by trial and error.

Developing a Complete Industrial Control Application

- ✓ Translate an operating requirement into I/O, logic, sequences, interlocks, and alarms.
- ✓ Test normal operation and abnormal scenarios before accepting the control logic.
- ✓ Complete a PLC Industrial Control Project from functional requirements through programming, testing, fault diagnosis, and final operating verification.

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 13, 2026	Dec. 17, 2026	5 days	4250.00 \$	KSA , Dammam
Feb. 1, 2027	Feb. 5, 2027	5 days	4250.00 \$	UAE , Dubai
April 19, 2027	April 23, 2027	5 days	4950.00 \$	England , London
July 19, 2027	July 23, 2027	5 days	4250.00 \$	UAE , Abu Dhabi

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