BLACKBIRD FOR TRAINING

PLC, SCADA and DCS Systems Training Course

23 – 27 August 2027
Barcelona (Spain)

UK Traininig
PARTNER



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Ref: 93_363455 **Date:** 23 – 27 August 2027 **Location:** Barcelona (Spain) **Fees:** 5900 GBP

Introduction:

This PLC, SCADA and DCS Systems Training Course equips you to design, integrate, and troubleshoot multi-tier industrial automation architectures across five intensive days. You will construct an operational Integrated PLC, SCADA and DCS Control Architecture Specification incorporating controller logic, supervisory telemetry, and segmented network interfaces. You need a working background in basic electrical instrumentation, process signals, and elementary digital logic to succeed in this practitioner-level course. You will practise through hands-on lab sessions, configuring programmable controllers, building supervisory interface screens, and analysing live industrial communication bus traffic in simulated engineering environments.

Course Objectives:

- Build structured control logic routines using IEC 61131-3:2025 languages for field instrumentation loops.
- Map industrial telemetry registers across Modbus TCP, DNP3, and OPC UA server configurations.
- Configure supervisory human-machine interface mimics and DCS alarm rationalisation matrices for plant workstations.
- Test network packet integrity and protocol exchanges using Wireshark packet capture software.
- Score operational technology security zones against IEC 62443-3-3 foundational requirements and security levels.
- Present a verified multi-tiered automation integration scheme for plant-wide process operations.

Target Audience:

- You program field controllers and calibrate instrumentation loops within manufacturing or utility operations.
- You configure supervisory data acquisition systems and maintain operator console graphics for continuous processes.
- You maintain distributed control systems hardware and diagnose communication bus faults across plant facilities.
- You integrate industrial networking protocols and manage operational technology interfaces within production sites.
- You commission safety instrumented functions and verify automated interlock responses across processing units.



Course Outline:

Day 1: Establishing Automation Architectures and Hardware Topology

- Evaluating Field Instrumentation Interfaces Across Plant Control Architectures
- Mapping Input and Output Modules to Marshalling Cabinet Terminals
- Allocating Discrete and Continuous Control Tasks Between Distributed Controllers
- Surveying Purdue Enterprise Reference Architecture Levels for System Segregation
- Build: System Boundary and Hardware Interconnection Register

Day 2: Implementing Industrial Protocols and Network Segmentation

- Configuring Modbus TCP and DNP3 Register Telemetry Maps
- Deploying OPC UA Client and Server Data Exchange Structures
- Establishing Zone and Conduit Boundaries per IEC 62443 Guidelines
- Structuring Fieldbus Communications Across Hybrid Distributed Process Networks
- Build: Multi-Protocol Network Segmentation and Telemetry Scheme

Day 3: Programming Controllers and Configuring Supervisory Interfaces

- Writing Control Logic with IEC 61131-3:2025 Structured Text Routines
- Developing Function Block Diagrams for Analog Process Regulating Loops
- Creating Dynamic Graphic Displays for Supervisory Operator Consoles
- Rationalising Process Alarm Limits and Event Escalation Priority Ladders
- Build: Multi-Loop Logic and Human-Machine Interface Graphic Database

Day 4: Diagnosing Communication Failures and Hardening System Resilience

- Capturing Industrial Bus Telemetry Using Wireshark Protocol Analysis Tools
- Troubleshooting Controller Redundancy Failover Mechanisms During Process Upsets
- Enforcing Foundational Requirements for IEC 62443-3-3 Target Security Levels
- Isolating Network Loop Faults and Packet Storm Broadcast Anomalies
- Build: Industrial Control Diagnostic and Incident Recovery Plan

Day 5: Integrating Multi-Tier Control Systems Through Applied Labs

- Connecting Field Controller Signals to Centralised DCS Process Databases
- Verifying Supervisory Control Commands Across Simulated Remote Terminal Units
- Testing End-to-End Failover Scenarios Across Redundant Communication Links
- Validating Safety Interlock Logic Against Process Shutdown Verification Criteria
- Build: Integrated PLC, SCADA and DCS Control Architecture Specification



Skills You Will Gain:

- IEC 61131-3:2025 Program Logic Engineering
- Multi-Protocol Industrial Telemetry Integration
- Supervisory Human-Machine Interface Configuration
- Distributed Control System Alarm Rationalisation
- Industrial Network Deep Packet Inspection
- Zone and Conduit Boundary Segmentation
- Controller Redundancy Failover Diagnostics

Why Attend This Course:

- Build an Integrated PLC, SCADA and DCS Control Architecture Specification to coordinate multi-vendor automation across your facility.
- Program robust logic routines using IEC 61131-3:2025 languages including Structured Text and Function Block Diagrams.
- Isolate network communication bottlenecks and packet drops across production lines using Wireshark packet capture tools.
- Establish segmented control network zones using Purdue reference principles and IEC 62443 foundational security requirements.

Conclusion:

On your first week back, you will deploy the Integrated PLC, SCADA and DCS Control Architecture Specification to review communication bottlenecks and controller partitioning in your operational plant. You will present the validated network conduits, I/O registers, and diagnostic routines to your lead automation engineer and operations superintendent. After initial deployment, you will examine controller scan cycles, network packet logs, and supervisory alarm response times to ensure that all automation tiers exchange telemetry cleanly without latency spikes or unhandled system faults.

Frequently Asked Questions FAQ:

What will you be able to do after the PLC, SCADA and DCS Systems Training Course?

You will be able to design, program, and integrate programmable logic controllers, supervisory control interfaces, and distributed control systems. You can write structured logic, map industrial communication protocols, configure operator consoles, and diagnose communication errors across production networks using dedicated packet inspection tools.



What do you need to know before starting the PLC, SCADA and DCS Systems Training Course?

You need a practical grounding in basic electrical circuitry, industrial instrumentation, and standard process signals such as 4-20 milliamp loops. Experience with basic computer networking concepts and elementary logic operations is recommended, though previous expertise with specific automation software suites is not required.

What do you build during the PLC, SCADA and DCS Systems Training Course?

You build an Integrated PLC, SCADA and DCS Control Architecture Specification. This functional technical deliverable contains controller I/O assignments, IEC 61131-3 logic routines, multi-protocol telemetry registers, supervisory graphics configurations, and a diagnostic fault recovery procedure aligned with international operational technology standards.

How does the PLC, SCADA and DCS Systems Training Course differ from a course on a neighbouring subject or at another level?

This course integrates field-level PLCs, supervisory SCADA systems, and plant-wide DCS architectures into a unified operational framework. Rather than focusing exclusively on single-vendor controller programming or isolated instrumentation troubleshooting, it delivers practitioner-level competencies for cross-platform data exchange, network segmentation, and communication bus diagnostics.

