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COURSE BROCHURE

PLC, SCADA and DCS Systems Training Course

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Registered in the United Kingdom and Saudi Arabia

PLC, SCADA and DCS Systems Training Course

PLC, SCADA and DCS Systems Training Course is a 1-week training course for automation engineers, electrical supervisors and control system practitioners who need to design, integrate and maintain resilient operational architectures, ending with an integrated automation architecture blueprint. Industrial plants face convergence between operational technology and enterprise networks, demanding unified supervisory strategies and robust network segmentation. Jupiter Prime Training delivers this PLC, SCADA and DCS Systems training course for industrial professionals.

Why PLC, SCADA and DCS Systems Matter Now

Modern process plants and power generation facilities face intensifying operational pressures that demand higher availability, predictable lifecycle maintenance and rigorous network resilience. Industrial infrastructure depends on balancing deterministic field logic, wide-area telemetry and centralised regulatory process loops across complex production assets. Unplanned downtime or poorly segregated communication lines expose critical facilities to cascading operational outages and severe equipment stress. Sustainable operations require structured engineering models to align field sensors, programmable controllers and supervisory displays into an orderly hierarchy. This course builds on international engineering frameworks, including the ANSI/ISA-95 enterprise-to-control integration standard, the IEC 61131-3 programmable controller programming baseline, the ANSI/ISA-18.2 alarm management standard and the IEC 62443 industrial control system cybersecurity framework.

Who Gains Most from PLC, SCADA and DCS Systems

- Automation and instrumentation engineers who design logic routines, configure process controllers and specify distributed system hardware
- Electrical and power systems specialists who supervise substation interfaces, intelligent electronic devices and wide-area telemetry links
- Process control and operations engineers who tune complex continuous regulatory loops and oversee central control room graphics
- Operational technology support staff who configure industrial networks, enforce boundary conduits and manage data integration gateways
- Maintenance supervisors who coordinate system diagnostic routines, fault isolation protocols and hardware lifecycle upgrades

A cross-functional unit of automation, electrical and operations personnel from a operating asset gains substantial value by attending together, enabling consistent alignment across field devices, supervisory displays and plant control strategies.

PLC, SCADA and DCS Systems Capabilities

Participants build practical engineering competence to evaluate, configure and secure industrial automation assets across discrete and continuous process facilities.

- Assess plant functional requirements to choose between programmable controllers, supervisory platforms and distributed architectures — capital project engineering teams
- Design structured controller programmes using standardised programming languages — commissioning and operations teams
- Configure supervisory visualization screens and alarm limits in line with human-centred display standards — control room operators
- Establish network segmentation boundaries and conduits across operational technology tiers — enterprise cybersecurity coordinators
- Align intelligent field electronic devices and remote telemetry units with central controllers — electrical protection and substation specialists
- Weigh operational availability and hardware redundancy options for critical process loops — asset maintenance managers

Key PLC, SCADA and DCS Systems Terms

- Programmable Logic Controller — A rugged digital industrial computer designed to execute deterministic logic, timing and sequential control in harsh plant environments.
- Supervisory Control and Data Acquisition — A software and hardware system that collects telemetry data, visualises operations and directs supervisory commands across dispersed sites.
- Distributed Control System — An integrated control architecture using autonomous local controllers distributed across a plant to manage continuous regulatory production processes.
- Purdue Enterprise Reference Architecture — A hierarchical structural model that segments industrial networks into functional levels, spanning physical instrumentation up to enterprise computing.
- Intelligent Electronic Device — A microprocessor-based controller designed for power and utility systems that performs protection, monitoring, metering and control functions.
- Alarm Flood — An operational state where the volume of active alarms exceeds the ability of control room operators to process them.

PLC, SCADA and DCS Systems Day by Day

Day 1: Automation Architectures and System Selection

- ANSI/ISA-95 Functional Hierarchy — Mapping Physical Process Interfaces to Supervisory Networks
- Controller Typology Assessment — Selecting Between Programmable Logic and Distributed Architectures
- Field Instrumentation and Bus Protocols — Connecting Process Sensors to Controller Input Modules
- Hardware Redundancy Topologies — Mitigating Single Points of Failure in Critical Plant Nodes
- Input and Output Module Configuration — Structuring Signal Wiring for High-Noise Industrial Environments

Day 2: Controller Logic and Process Sequencing

- IEC 61131-3 Programming Languages — Standardising Ladder Logic and Structured Text Routines
- Sequential Function Chart Development — Coordinating State Transitions in Complex Batch Units
- Proportional Integral Derivative Loop Tuning — Stabilising Continuous Variables in Process Operations
- Controller Memory and Tag Addressing — Structuring Global Databases for Deterministic Execution Cycles
- Diagnostic Buffer Analysis — Isolating Controller Faults and Communication Interface Errors

Day 3: SCADA Systems and Remote Telemetry

- Human Machine Interface Graphic Standards — Designing Intuitive Displays for Fast Operational Response
- ANSI/ISA-18.2 Alarm Lifecycle Management — Prioritising Safety Warnings and Suppressing Nuisance Alerts
- Remote Terminal Unit Architecture — Gathering Field Telemetry Over Constrained Communication Channels
- Industrial Historian Data Logging — Archiving Process Variables for Quality and Performance Audits
- IEC 61850 Substation Integration — Linking Protection Relays and Power Automation Controller Nodes

Day 4: Network Architecture and OT Cybersecurity

- IEC 62443 Security Zones and Conduits — Isolating Field Controller Networks from Enterprise Incursions
- Industrial Ethernet Switch Configuration — Managing Deterministic Traffic Prioritisation and Virtual Local Networks
- Operational Demilitarized Zone Gateways — Controlling Data Exchange Between Plant Floor and Enterprise
- Access Control and Privilege Configuration — Restricting Engineering Station Modifications to Authorised Personnel
- Backup and Disaster Recovery Protocols — Securing Controller Firmware and System Database Archives

Day 5: Integration Practice and System Validation

- Architecture Model Synthesis — Combining Programmable Controllers and Distributed Nodes
- Alarm Strategy Verification — Testing Operator Displays Against Simulated Abnormal Process Conditions
- Network Segmentation Validation — Applying Conduit Boundaries to Control Traffic Flow
- Failover Simulation and Redundancy Testing — Evaluating System Behaviour During Component Outages
- Integrated Automation Architecture Blueprint — Finalising System Specifications, Boundary Drawings and Communication Matrices

Applying PLC, SCADA and DCS Systems After the Course

- Audit active plant control loops against the functional levels of the ANSI/ISA-95 framework to identify unsegmented controller interfaces and redundant data pathways.
- Review control room alarm rationalisation records against ANSI/ISA-18.2 priorities to eliminate nuisance alarms and establish documented operator action limits.

PLC, SCADA and DCS Systems Questions FAQ

What are PLC, SCADA and DCS systems and why do they matter now?

PLC, SCADA and DCS systems are the foundational digital hardware and software platforms that govern modern manufacturing, energy and utility processes. Mastering them is essential because modern plants require tightly integrated automation, dependable uptime and robust network segmentation between process instrumentation and enterprise IT layers.

Which roles gain most from PLC, SCADA and DCS systems?

Automation engineers, electrical supervisors, process control specialists and operational technology coordinators gain the most from this subject. If you manage controller programming, plant network design or supervisory operations across discrete, continuous or utility infrastructure assets, these engineering principles directly enhance your operational performance.

How does this course differ from basic controller programming?

Basic programming courses focus narrowly on simple ladder logic for single controllers. This course takes an overarching engineering perspective, examining the functional boundaries, communication protocols, alarm management lifecycles and cybersecurity segmentation needed to coordinate integrated programmable logic, supervisory control and distributed automation across an enterprise.

What work product do participants bring back from the course?

Participants leave with an integrated automation architecture blueprint tailored to plant requirements. This document provides clear network segmentation boundaries, controller selection rationales, redundancy matrices and alarm management protocols ready for immediate evaluation and deployment within your operating facility.

PLC, SCADA and DCS Systems: The Way Forward

The integrated automation architecture blueprint provides an operational foundation for plant infrastructure. Engineering leadership uses this work product to guide control system migrations, evaluate vendor capital bids and resolve persistent interface bottlenecks between field devices and central control rooms. Asset owners should revisit this architecture during every major facility expansion or network modernisation review.