CONCEPT

Industrial Automation Systems: PLC, SCADA, and DCS Integration Training Course



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Introduction:

Industrial Automation Systems: PLC, SCADA, and DCS Integration Training Course is a one-week course for control systems practitioners, instrumentation specialists, and automation maintenance teams, culminating in an Automation Systems Integration and Commissioning Dossier. Fragmented controller architectures, incompatible communication protocols, and uncoordinated alarming create process downtime, data latency, and heightened cyber vulnerability across critical facilities. Nominees already configure logic rungs, calibrate field instruments, and monitor supervisory interfaces, advancing their capability through structured hands-on lab exercises. CoreConcept Training Center delivers this course to align plant floor controls with enterprise supervisory standards across operating facilities.

Course Objectives:

- Architect unified controller networks integrating programmable logic controllers, distributed control systems, and supervisory platforms
- Standardise multi-vendor control logic across distributed nodes using IEC 61131-3 programming languages and modular function blocks
- Configure secure industrial communications and tag exchange across field networks using OPC UA and Modbus TCP protocols
- Design high-performance supervisory operator graphics and rationalised alarm hierarchies following ISA-101 and ISA-18.2 standards
- Implement industrial control network segmentation and zone protection aligned with ISA/IEC 62443-3-3 security requirements
- Assemble the Automation Systems Integration and Commissioning Dossier to validate integrated loop testing and system acceptance

Target Audience:

- Control systems engineers responsible for configuring programmable logic controllers and integrating distributed control system field loops
- SCADA application developers responsible for designing operator human-machine interfaces and configuring historian data acquisition
- Instrumentation and control technicians responsible for testing field input and output modules and maintaining digital communication buses
- Automation maintenance specialists responsible for diagnosing controller faults, tracing industrial network traffic, and managing firmware revisions

Course Outline:

Day 1: Industrial Automation Architectures and Field Interfacing

- Purdue Enterprise Reference Architecture Evaluating Multilayer Control Hierarchy
- IEC 61131-3 Software Models Structuring Modular Controller Programs
- Fieldbus Foundation Specifications Mapping Digital Field Device Telemetry
- Modbus TCP Protocols Interfacing Distributed Input and Output Racks
- P&ID Operational Review Formulating Automation Control Narrative Requirements

Day 2: Communication Protocols and Multi-Vendor System Interoperability

- OPC UA Information Models Mapping Secure Supervisory Tags
- Profinet Industrial Ethernet Standards Configuring Deterministic Controller Communications
- DNP3 Telemetry Protocols Managing Remote Terminal Unit Exchanges
- Industrial Demilitarized Zone Guidelines Establishing Secure Protocol Gateways
- Wireshark Packet Analysis Diagnosing Industrial Network Latency Anomalies

Day 3: SCADA Visualisation and Lifecycle Alarm Management

- ISA-101 Ergonomic Design Principles Structuring High-Performance Display Hierarchies
- ISA-18.2 Management Frameworks Rationalising Process Alarms and Severities
- Historian Data Architecture Configuring Long-Term Trend Storage Registries
- System Platform Graphic Templates Building Reusable Supervisory Faceplates
- IEC 62682 Implementation Guidelines Suppressing Nuisance and Chattering Alarms

Day 4: Control Loop Optimisation and Industrial Cybersecurity Controls

- ISA/IEC 62443-3-3 Security Standards Implementing System Security Levels
- ISA/IEC 62443-4-2 Technical Specifications Enforcing Component Hardening Baselines
- Closed-Loop Regulatory Control Models Tuning Distributed PID Algorithms
- Controller Redundancy Frameworks Configuring Automated Failover Processing Routines
- Factory Acceptance Testing Checklists Validating Integrated Safety Interlocks

Day 5: Integration Lab and Site Commissioning Execution

- Multi-Platform Integration Lab Operating Cross-Controller Tag Exchanges
- Supervisory HMI Lab Testing Real-Time Alarm Rationalisation Sequences
- ISA/IEC 62443 Network Segmentation Lab Verifying Access Protection Rules
- Integrated Loop Testing Lab Executing Multi-System Verification Scenarios
- Automation Systems Integration and Commissioning Dossier Finalising Artefact

Skills You Will Gain:

- IEC 61131-3 Multi-Language Logic Programming
- OPC UA Tag Namespace Configuration
- High-Performance HMI Screen Design
- ISA-18.2 Alarm Flooding Mitigation
- ISA/IEC 62443 Industrial Network Hardening
- Multi-Vendor Controller Loop Integration
- Factory Acceptance Testing Execution

Why Attend This Course:

- Deliver the Automation Systems Integration and Commissioning Dossier to the lead automation engineer to govern multi-vendor system rollouts.
- Decide controller network topologies, data exchange rates, and alarm priorities across integrated operating units with technical confidence.
- Prevent costly unscheduled facility shutdowns caused by communication gateway timeouts, unhandled alarm floods, or unauthorised controller modifications.
- Guide site technicians in conducting structured loop checks, troubleshooting protocol mismatches, and enforcing industrial network segmentation standards.

Conclusion:

Following this course, the organisation implements the Automation Systems Integration and Commissioning Dossier to standardise multi-vendor control architectures. The lead control systems engineer and operations superintendent utilise this deliverable to approve supervisory graphics, govern PLC-to-DCS communication interfaces, and commission plant-wide automation networks. Within ninety days of deployment, the maintenance engineering department conducts an initial system review of controller network utilisation, alarm distribution rates, and gateway failover integrity against design criteria to verify platform stability and protect process availability.

Frequently Asked Questions FAQ:

Which roles should an organisation nominate for the Industrial Automation Systems: PLC, SCADA, and DCS Integration Training Course?

Organisations should nominate control systems engineers, SCADA developers, instrumentation technicians, and automation maintenance specialists. Nominees are operational practitioners who program controllers, maintain industrial field networks, design supervisory displays, and commission integrated process automation packages across industrial processing plants and utility infrastructures.

What should nominees already do at work before attending the Industrial Automation Systems: PLC, SCADA, and DCS Integration Training Course?

Nominees should already draft basic controller ladder routines, wire input and output modules, and calibrate field transmitters. Familiarity with standard electrical schematics, basic piping and instrumentation diagrams, and plant operating displays ensures participants immediately engage with complex protocol integration and cybersecurity segmentation exercises.

What does the organisation receive when the participant returns from the Industrial Automation Systems: PLC, SCADA, and DCS Integration Training Course?

The organisation receives an Automation Systems Integration and Commissioning Dossier. This practical package provides protocol mapping tables, ISA-18.2 alarm rationalisation schedules, ISA-101 screen design rules, and factory acceptance loop testing checklists to standardise site control system deployments.

Which standard or framework does the Industrial Automation Systems: PLC, SCADA, and DCS Integration Training Course follow?

The course follows IEC 61131-3 for controller software modelling and programming languages, ISA-101 for human-machine interface design, ISA-18.2 and IEC 62682 for alarm management lifecycle execution, and the ISA/IEC 62443 series for industrial automation network security requirements.