

Schneider Electric DCS

COURSE CONTENT

GET IN TOUCH



Multisoft Systems
B - 125, Sector - 2, Noida



(+91) 9810-306-956



info@multosoftsystems.com



www.multosoftsystems.com

About Multisoft

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About Course

Schneider Electric DCS Training by Multisoft Systems provides a structured understanding of distributed control system engineering and its role in industrial process automation. The training focuses on system architecture, controller and I/O configuration, process control strategies, field signal integration, HMI operations, alarm and trend management, industrial communication, redundancy, and system diagnostics. Participants also explore troubleshooting, backup, recovery, security, and maintenance practices through practical learning scenarios. The course is designed to help automation, instrumentation, and control professionals gain relevant knowledge for working with Schneider Electric DCS environments across process industries.

Module 1: Introduction to Distributed Control Systems

- ✓ Fundamentals of process automation
- ✓ Introduction to Distributed Control Systems
- ✓ DCS versus PLC and SCADA systems
- ✓ Role of DCS in continuous and batch processes
- ✓ Distributed control philosophy
- ✓ Basic control system hierarchy
- ✓ Field, control, supervisory, and management levels
- ✓ Overview of DCS engineering lifecycle
- ✓ Typical industrial DCS applications

Module 2: Schneider Electric DCS Architecture

- ✓ Introduction to Schneider Electric process automation environment
- ✓ Understanding distributed system architecture
- ✓ Engineering and operator workstations
- ✓ Application and system servers
- ✓ Process controllers
- ✓ I/O subsystems
- ✓ Industrial Ethernet infrastructure
- ✓ Control and supervisory networks
- ✓ Client-server architecture
- ✓ Data flow across DCS components
- ✓ Redundancy concepts
- ✓ Availability and reliability considerations
- ✓ Typical plant-level architecture

Module 3: DCS Hardware and System Components

- ✓ Controller hardware overview
- ✓ Processor and communication modules
- ✓ Power supply modules
- ✓ Local and remote I/O
- ✓ Analog input and output modules
- ✓ Digital input and output modules
- ✓ Communication interface modules
- ✓ Cabinets and system panels
- ✓ Terminal assemblies
- ✓ Field wiring concepts
- ✓ Hardware addressing
- ✓ Module status indication
- ✓ Hardware redundancy
- ✓ Hardware selection considerations

Module 4: Engineering Environment and Project Configuration

- ✓ Understanding the engineering workstation
- ✓ Engineering project structure
- ✓ Creating and organizing a control project
- ✓ Plant hierarchy configuration
- ✓ Area and unit organization
- ✓ Equipment hierarchy
- ✓ Hardware configuration

- ✓ Controller assignment
- ✓ I/O assignment
- ✓ Naming and tagging conventions
- ✓ Engineering database concepts
- ✓ Configuration validation
- ✓ Download and deployment concepts
- ✓ Online and offline engineering considerations
- ✓ Project documentation practices

Module 5: Controller Configuration

- ✓ Controller architecture and functionality
- ✓ Creating controller configurations
- ✓ Controller resource allocation
- ✓ Controller communication settings
- ✓ Execution and scan concepts
- ✓ Control application assignment
- ✓ Task organization
- ✓ Controller initialization
- ✓ Loading control applications
- ✓ Online controller monitoring
- ✓ Controller operating states
- ✓ Controller redundancy concepts
- ✓ Switchover considerations
- ✓ Controller health diagnostics

Module 6: I/O Configuration and Field Device Integration

- ✓ Understanding process I/O
- ✓ Analog input configuration
- ✓ Analog output configuration
- ✓ Digital input configuration
- ✓ Digital output configuration
- ✓ Channel configuration
- ✓ Signal types and ranges
- ✓ Engineering unit configuration
- ✓ Scaling process signals
- ✓ Signal conditioning concepts
- ✓ Status and quality information
- ✓ I/O addressing and mapping
- ✓ Remote I/O configuration concepts
- ✓ Field instrument connectivity
- ✓ Smart field device integration concepts
- ✓ I/O diagnostics
- ✓ Handling channel and module faults

Module 7: Control Strategy and Application Engineering

- ✓ Introduction to control application engineering
- ✓ Control function organization
- ✓ Function blocks and control objects
- ✓ Creating basic control strategies
- ✓ Analog signal processing

- ✓ Digital logic processing
- ✓ Mathematical functions
- ✓ Comparison functions
- ✓ Selector functions
- ✓ Timer and counter functions
- ✓ Signal routing
- ✓ Control mode concepts
- ✓ Manual and automatic operation
- ✓ Control strategy execution
- ✓ Parameter configuration
- ✓ Monitoring control applications online
- ✓ Control strategy testing

Module 8: Regulatory and Process Control

- ✓ Fundamentals of feedback control
- ✓ Process variable, setpoint, and manipulated variable
- ✓ PID control principles
- ✓ PID controller configuration
- ✓ Proportional, integral, and derivative actions
- ✓ Controller operating modes
- ✓ Output limits
- ✓ Setpoint limits
- ✓ Direct and reverse control action
- ✓ Cascade control concepts
- ✓ Ratio control
- ✓ Feedforward control concepts

- ✓ Split-range control
- ✓ Override and selector control
- ✓ Loop monitoring
- ✓ Basic PID tuning considerations
- ✓ Troubleshooting control loop performance

Module 9: Sequence, Interlock, and Logic Configuration

- ✓ Introduction to sequential process control
- ✓ Boolean logic implementation
- ✓ AND, OR, NOT, and combination logic
- ✓ Permissive logic
- ✓ Equipment interlocks
- ✓ Start and stop logic
- ✓ Motor control concepts
- ✓ Valve control logic
- ✓ Trip conditions
- ✓ Reset logic
- ✓ Timer-based sequences
- ✓ Step and state concepts
- ✓ Equipment operating modes
- ✓ Failure handling
- ✓ Sequence monitoring
- ✓ Testing interlock conditions
- ✓ Process safety considerations in control logic

Module 10: HMI and Operator Interface Engineering

- ✓ Operator interface fundamentals
- ✓ HMI architecture
- ✓ Operator workstation concepts
- ✓ Creating process displays
- ✓ Display navigation
- ✓ Process symbols and graphical objects
- ✓ Dynamic object behavior
- ✓ Tag linking
- ✓ Process value visualization
- ✓ Equipment status indication
- ✓ Operator commands
- ✓ Faceplates
- ✓ Control loop displays
- ✓ Motor and valve displays
- ✓ Status and diagnostic displays
- ✓ Display hierarchy
- ✓ Operator usability considerations
- ✓ Testing operator graphics

Module 11: Alarm and Event Management

- ✓ Alarm management fundamentals
- ✓ Process alarms versus system alarms
- ✓ Alarm configuration
- ✓ High and low alarms

- ✓ High-high and low-low alarms
- ✓ Deviation alarms
- ✓ Digital alarms
- ✓ Alarm priorities
- ✓ Alarm acknowledgement
- ✓ Alarm states
- ✓ Alarm summaries
- ✓ Event logging
- ✓ Operator events
- ✓ Alarm filtering
- ✓ Alarm shelving and suppression concepts
- ✓ Alarm rationalization principles
- ✓ Alarm flood considerations
- ✓ Troubleshooting alarm configuration

Module 12: Historian, Trending, and Process Data

- ✓ Process data collection concepts
- ✓ Historical data architecture
- ✓ Selecting process variables for history
- ✓ Data logging
- ✓ Sampling concepts
- ✓ Historical trends
- ✓ Real-time trends
- ✓ Trend configuration
- ✓ Multiple-variable trend analysis
- ✓ Event and alarm history

- ✓ Process performance analysis
- ✓ Historical data retrieval
- ✓ Data retention considerations
- ✓ Using trends for troubleshooting
- ✓ Reporting concepts

Module 13: Industrial Communication and System Integration

- ✓ DCS communication fundamentals
- ✓ Industrial Ethernet concepts
- ✓ Network topology
- ✓ Controller-to-controller communication
- ✓ Controller-to-server communication
- ✓ Operator station communication
- ✓ Communication redundancy
- ✓ Modbus communication concepts
- ✓ Modbus TCP/IP integration
- ✓ OPC communication concepts
- ✓ Third-party system integration
- ✓ PLC and package unit integration
- ✓ Field device communication concepts
- ✓ Gateway integration
- ✓ Communication status monitoring
- ✓ Network troubleshooting fundamentals

Module 14: System Administration and Cybersecurity

- ✓ DCS administration fundamentals
- ✓ User account management
- ✓ Roles and access privileges
- ✓ Operator and engineering permissions
- ✓ Authentication concepts
- ✓ Workstation administration
- ✓ Server administration considerations
- ✓ System configuration management
- ✓ Network access considerations
- ✓ Industrial cybersecurity fundamentals
- ✓ Segmentation and defense-in-depth concepts
- ✓ Secure engineering practices
- ✓ Change management
- ✓ Audit trail concepts
- ✓ System access monitoring
- ✓ Security considerations for DCS environments

Module 15: Diagnostics, Troubleshooting, Backup, and Maintenance

- ✓ DCS diagnostic philosophy
- ✓ System health monitoring
- ✓ Controller diagnostics
- ✓ I/O diagnostics
- ✓ Communication diagnostics

- ✓ Workstation and server diagnostics
- ✓ Identifying hardware faults
- ✓ Identifying configuration errors
- ✓ Troubleshooting communication failures
- ✓ Troubleshooting I/O problems
- ✓ Diagnosing control application issues
- ✓ Alarm-based troubleshooting
- ✓ System log interpretation
- ✓ Configuration backup
- ✓ Project backup
- ✓ Restore concepts
- ✓ Preventive maintenance practices
- ✓ Configuration change control
- ✓ Maintenance documentation
- ✓ System recovery considerations

Module 16: Practical DCS Engineering Project and Plant Scenarios

- ✓ Understanding a sample process automation requirement
- ✓ Preparing plant hierarchy
- ✓ Defining process tags
- ✓ Configuring controller resources
- ✓ Configuring analog and digital I/O
- ✓ Creating process control loops
- ✓ Implementing PID control

- ✓ Configuring motor and valve logic
- ✓ Creating permissives and interlocks
- ✓ Designing operator graphics
- ✓ Configuring alarms
- ✓ Creating process trends
- ✓ Testing control applications
- ✓ Simulating process conditions
- ✓ Diagnosing configuration faults
- ✓ Reviewing system health
- ✓ Backup and documentation
- ✓ Integrated project review