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Course Name

Practical SCADA Systems for Industrial Applications

Sector Name

Instrumentation & Controls

Document Type

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Course Introduction

This course is designed to provide a thorough understanding of the fundamental concepts and the practical issues of SCADA systems. Particular emphasis has been placed on the practical aspects of SCADA systems with a view to the future. Formulae and details that can be found in specialized manufacturer manuals. have been purposely committed in favor of concepts and definitions.

It provides an introduction to the fundamental principles and terminology used in the field of SCADA. It is a summary of the main subjects to be covered throughout the course. SCADA (supervisory control and data acquisition) has been around as long as there have been control systems. The first ‘SCADA’ systems utilized data acquisition by means of panels of meters, lights and strip chart recorders. The operator manually operating various control knobs exercised supervisory control. These devices were and still are used to do supervisory control and data acquisition on plants, factories and power generating facilities.

The second part of this course covers the application of SCADA systems for the monitoring and control of manufacturing facilities within a single site. It also covers the additional elements that are common to all SCADA systems. These include Alarm Management, Human Management Interface (HMI), Network Security, SCADA Historians, Troubleshooting, Mainte-nance and Specification issues.

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Target Audience

This course is intended for Instrumentation, and Process Controls Engineers and Highly Qualified Technicians. Also those who have direct responsibility for or require a working knowledge of SCADA/ PLC's will benefit from the most up-to-date developments in Modern Process Control.

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Learning Objectives

- ✓ Develop their existing understanding of SCADA system.
- ✓ Recognize the different components of a SCADA system
- ✓ Appreciate the basic principles of data communications
- ✓ Evaluate requirements for PLC-to-SCADA Communications and understand the importance of the ISO OSI Model
- ✓ Appreciate the use of wireless communications in the Industrial environment and recognize the various wireless communication standards.
- ✓ Apply radio telecommunications in a practical manner and make use of troubleshooting techniques
- ✓ Apply Modbus in a practical manner and make use of troubleshooting techniques
- ✓ Understand the construction, the arc extinguishing principles of Surface Production Facilities Operations
- ✓ Acquire the skills and practical knowledge to identify the requirements for SCADA system.
- ✓ Develop their existing understanding of Surface Equipment Facilities Troubleshooting

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Course Outline

✓ DAY 01

Module (01) Networking and Data Communication

- ✓ 1.1 Network Communication
- ✓ 1.2 Network Structure
- ✓ 1.3 Point-to-point Communication
- ✓ 1.4 Broadcast ’Multiple Drop’ Communication
- ✓ 1.5 ISO OSI (Open System interconnection) Reference
- ✓ 1.6 Local Area Network (LAN)
- ✓ 1.7 LAN Characteristics & Topologies
- ✓ 1.8 LAN’s Components
- ✓ 1.9 Transmission Media
- ✓ 1.9.1 Twisted Pair
- ✓ 1.9.2 Coaxial Cable
- ✓ 1.9.3 Optical Fiber Cable

Module (02) Medium Access Control Techniques

- ✓ 2.1 CSMA (Carrier Sense Multiple Access)
- ✓ 2.2 CSMA with Collision Detection (CSMA/CD_
- ✓ 2.3 Token Bus
- ✓ 2.4 Token Ring

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Course Outline

✓ Day 02

Module (03) Wide Area SCADA Systems

- ✓ 3.1 Hardware Alternatives (RTU/PLC)
- ✓ 3.2 Communication Concentrators
- ✓ 3.3 Communication Alternatives
- ✓ 3.4 Communication Architectures
- ✓ 3.5 Communication Philosophies

Module (04) SCADA System Hardware/Software

- ✓ 4.1 Hardware Components
- ✓ 4.2 Operation and Selection Issues
- ✓ 4.3 SCADA Software Functions
- ✓ 4.4 Response Times
- ✓ 4.5 Redundancy Issues
- ✓ 4.6 Specification and Configurations Issues

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Course Outline

✓ Day 03

Module (05) Communication Protocols

- ✓ 5.1 RS-232/RS-485 interface Standards
- ✓ 5.2 MODBUS Protocol
- ✓ 5.3 DNP 3.0 Protocol

Module (06) Communication for SCADA Systems

- ✓ 6.1 Serial Communication
- ✓ 6.1.1 Alternatives
- ✓ 6.1.2 Dimensioning Issues
- ✓ 6.1.3 Configuration
- ✓ 6.2 LAN/WAN Communication
- ✓ 6.2.1 Alternatives
- ✓ 6.2.2 Dimensioning Issues
- ✓ 6.2.3 Configuration

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Course Outline

✓ Day 04

Module (07) Process Plant SCADA Systems

- ✓ 7.1 Hardware Alternatives (DCS/PLC/Fieldbus)
- ✓ 7.2 Communication Alternatives
- ✓ 7.3 Fieldbus / Profibus
- ✓ 7.4 Foundation Fieldbus
- ✓ 7.5 Adjusting Pressure

Module (08) SCADA Configuration

- ✓ 8.1 TCP/IP
- ✓ 8.2 Modbus TCP
- ✓ 8.3 Open process Control (OPC)
- ✓ 8.4 SCADA Installation & Commissioning

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Course Outline

✓ Day 05

Module (09) SCADA Network

- ✓ 9.1 Alarm Layout and Organization
- ✓ 9.2 Alarm Priorities
- ✓ 9.3 Alarm processing and Reporting
- ✓ 9.4 Human Management Interface (HMI)
- ✓ 9.5 SCADA Network Security
- ✓ 9.6 SCADA Historian
- ✓ 9.7 Archiving Plant Data

Module (10) SCADA Maintenance & Troubleshooting

- ✓ 10.1 Maintenance Activities
- ✓ 10.2 Problem Isolation
- ✓ 10.3 Testing Methodology
- ✓ 10.4 Noise Issues
- ✓ 10.5 Communication Testing

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Oct. 18, 2026	Oct. 22, 2026	5 days	4250.00 $	Oman , Muscat
Jan. 18, 2027	Jan. 22, 2027	5 days	4250.00 $	UAE , Dubai
April 19, 2027	April 23, 2027	5 days	4250.00 $	UAE , Abu Dhabi
Aug. 24, 2026	Aug. 28, 2026	5 days	4950.00 $	Spain , Barcelona

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