€ TRAINING

Practical SCADA and Telemetry System

28 July - 1 August 2024
Dubai (UAE)

Practical SCADA and Telemetry System

REF: O1258 DATE: 28 July - 1 August 2024 Venue: Dubai (UAE) - Fee: 5830 Euro

Introduction:

Although the PLC has been with us for more than forty years, its role in the industrial environment is widely accepted. For many of its early years, its role was confined to simple sequence control and interlocking. Later, however, with the advance of increasingly sophisticated microprocessor technology, analog capability - particularly PID control -, and communications, it became an integral part of the PLC functionality. However, the PLC was essentially blind and it was really only with the advent of the current generation of Supervisory Control and Data Acquisition SCADA systems that the PLC/SCADA took on a new life - competing directly with advanced DCS systems and other advanced automation systems.

This workshop, SCADA and Telemetry Systems, is designed to provide engineers and technicians with the basic theoretical and practical understanding of SCADA systems together with an overview of modern digital communication standards and networks - starting at the basic RS232 standard right through to Modbus over TCP/IP and how this can be applied to optimize their systems in terms of safety, flexibility and costs. The workshop also discusses modern radio links, ranging from application through to troubleshooting, and the use and selection of wireless link devices.

Course Objectives:

At the end of this course the participants will be able to:

- Recognize the different components of a SCADA system
- Appreciate the basic principles of data communications
- Evaluate the requirements for PLC-to-SCADA communications
- Understand the importance of the ISO OSI model
- Appreciate the use of wireless communications in the industrial environment
- Recognize the various wireless communication standards
- Apply radio telecommunications in a practical manner and make use of troubleshooting techniques
- Understand the concept of Modbus/Serial and Modbus/TCP
- Apply Modbus in a practical manner and make use of troubleshooting techniques
- Understand modern SCADA applications and deployments

Targeted Audience:

- Professionals involved in designing, selecting, sizing, specifying, installing, testing, operating, and maintaining process instrumentation and control systems
- Automation Engineers
- Chemical Engineers
- Consulting Engineers
- Design Engineers
- Electrical Engineers
- Electricians
- Instrument and Process Control Engineers and Technicians
- Maintenance Engineers
- Mechanical Engineers and Technicians
- Operations Engineers

- Process Engineers
- Project Managers
- System Integrators
- Professionals with little to moderate production facility design and/or operations background
- Other professionals who want a better understanding of the subject matter

Course Outlines:

Unit 1:

Introduction to SCADA systems:

- Overview
- Modern Instrumentation and Control Systems
- Smart Instrumentation

Basic Communication Principles:

- Overview
- Transmission Modes
- Digital systems
- ASCII Code
- Description of UART
- Standards

Numbering Systems:

- Binary numbering
- Hexadecimal

SCADA Systems:

- Hardware and software architecture
- Functionality and alarm handling
- Marshalling terminals and RTUs
- Basic communication system
- Application development
- Engineering

Remote Terminal Units RTUs:

- Introduction
- RTU environmental enclosures
- Control processor and memory CPU
- Digital processing

Unit 2:

Communications Media:

- Cabling

- Fiber optics
- Serial Data Communications:
    - RS-232/485 Standards
    - ISO OSI Model
- Error detection
    - Checksum
    - CRC
- HART Protocol
- Modbus Protocol

Unit 3:

SCADA Instrumentation:

- Overview
- Block Diagram
- Sensors
- Electronics
- Power considerations
- HMI
- Installation, Maintenance, Troubleshooting
- Transmitter
- SCADA channels: wired & wireless
- Examples

Unit 4:

SCADA System Architecture:

- Control Room
- Supervisory control
- PLC
- DCS
- Fieldbus: Profibus, Foundation Fieldbus
- Sensors & Actuators
- Communication Links and channels
- HMI
- Alarms
- PLC - SCADA communications

Telemetry: Wireless Links:

- Elements of a Radio Link
- The radio spectrum and frequency allocation
- IEEE Wireless standards
- Examples of devices
- Miscellaneous Considerations

Unit 5:

Products:

- Siemens WinCC and SIMATIC

Applications:

- Chemical plant
- Oil & Gas
- Waste Water Treatment
- Boiler automation

Demonstrations:

- Intelligent irrigation system
- The intelligent industrial security system

The Future:

- Industrial Internet II
- SCADA and the Internet of Things IoT
- IP Protocol Version 6: Ipv6