



# PLC, Telemetry & SCADA Technologies

### Introduction:

This is a highly relevant, industrially based training course that will update the skills and knowledge of Technicians and Engineers alike. This course is 'hands-on' using industry-standard PLC's in a simulated environment. Through this approach, the delegate will progress from learning the fundamentals of PLC application to writing, debugging, and finally designing their programs.

Radio and wire-based telemetry systems, essential for an understanding of modern communication methods deployed in the field are also studied and explained. These are vital for a comprehensive understanding in their use with not only programmable controllers but any Instrumentation / Controller remote application.

This course also includes a study of modern SCADA technologies. Again, together with a hands-on approach using a modern industrially compliant SCADA software package, the delegate will acquire new and updated skills essential in any fast-moving industrial environment

### **Targeted Groups:**

- Electrical Engineers and Technicians
- Control Engineers and Technicians
- Communication Engineers and Technicians
- IT and Software Engineers and Technicians
- Design Engineers
- Instrumentation Engineers and Technicians
- Electricians
- Instrument and Process Control Engineers and Technicians
- Mechanical Engineers and Technicians
- Operations Engineers
- Process Engineers and Technicians
- Production Professionals
- Project Design Professionals
- System Integrators
- Other Professions Managers, Engineers, Technicians involved in the Control and Process Industries who require a fuller understanding of that industry

# **Course Objectives:**



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

- Give an understanding of the operation, architecture, and use of an industry-standard PLC for Control purposes
- Investigate the operation of the PLC through designing, building and testing typical programs in the ladder programming language using industry-standard PLC's in a simulated environment
- Become familiar and confident with the PLC, Telemetry and SCADA environments
- Understand the concepts of Radio Telemetry and acquire the knowledge relating to the application, limitation, and use of frequency bands used
- Gain an understanding and knowledge of common wire-based communication protocols
- Become familiar and knowledgeable with an industry compliant SCADA software package

### **Targeted Competencies:**

- A study and explanation of the PLC for Control purposes
- Understanding through 'hands-on' approach using industry-standard PLC's in a simulated environment of PLC programming design and debugging
- Investigation of Radio telemetry methods, frequencies used and application and limitation of each frequency band
- Study of commonly used wire-based telemetry methods and protocols such as RS232 and RS485
- Investigation of SCADA, its structure, and application. Understanding of a typical SCADA application through a hands-on approach using an industry compliant SCADA software package

### **Course Content:**

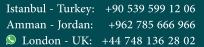
# **Unit 1: Introduction to Control Strategies:**

- Continuous Control Systems
- Sequential Control Systems
- Relay Based Systems
- Introduction to PLC Systems
- PLC VS Relay Systems
- Programming Formats
- Logical Continuity
- Software Familiarisation
- Introduction to Industry Standard PLC Programming Software

#### **Unit 2: PLC Architecture:**

- System Architecture
- Memory and I/O Types
- Scanning Algorithms
- Program Scan Cycle

## **Unit 3: Radio Telemetry Systems:**





- Introduction
- Elements of a Radio Link
- The Radio Spectrum
- Frequency Ranges
- System Design Considerations

## **Unit 4: PLC Programme Development:**

- Analysis of PLC Programs
- Design Methodology and Development of PLC Programs
- Timer Method of Program Development

#### **Unit 5: Serial Data Communications:**

- Communication Methods Simplex, Half-Duplex, Full-Duplex
- RS232 Standard
- RS422 Standard
- RS485 Standard

### Unit 6: Analog I/O and Processing:

- Analog Inputs and Outputs
- A/D and D/A Conversion
- Programming Analogue Modules and Advanced Instructions

#### **Unit 7: Introduction to SCADA:**

- System Architecture
- Configuration and Operation
- Introduction to Industry Standard SCADA Software
- Design and Development of a new SCADA Project
- Local Area Networks LAN's