

Scandinavian Academy Training Center

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# Course: PLC Telemetry and SCADA Technologies

| Code | City | hotel | Start | End | price | Language - Hours |
|---|---|---|---|---|---|---|
| IT-120SA | Al Baha | Hotel Meeting | 2027-09-19 | 2027-09-23 | 10950 SR | En - 25 |

## Introduction

This is a highly relevant, industrially based course which will update the skills and knowledge of Technicians and Engineers alike. The 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 own 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.

The 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.

**Some of the main topics covered include:**

- 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
- Case study in the design of a Radio Telemetry link
- 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

## Objectives

**The main objectives of this seminar are:**

- To give an understanding of the operation, architecture and use of an industry standard PLC for Control purposes
- By using a hands-on approach, enable the delegate to 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
- To allow the delegate to become familiar and confident with the PLC, Telemetry and SCADA environments
- To understand the concepts of Radio Telemetry and acquire the knowledge relating to the application, limitation and use of frequency bands used
- To gain an understanding and knowledge of common wire based communication protocols
- To disseminate and share experience and knowledge with other delegates through open session discussions hence broadening the knowledge base of all

## Training Methodology

The seminar is delivered via a series of mixed activities which will at times involve delegate participation. Theoretical content is delivered by informal lecture and discussion and supplemented where appropriate with tutorial sessions using worked examples.

An important part of the program is the hands-on aspect. Using industry compliant software and PLCs, approximately a third of the total time will be devoted to practical activities. Delegates will acquire the skills and confidence to investigate, debug and

where necessary modify and/or design their own control systems employing a PLC.

## Organizational Impact

**By attending this seminar the delegate will return to their company more confident in the knowledge and use of PLC, Telemetry and SCADA systems. More specifically, they will:**

- Be equipped with new skills and knowledge which must impact positively within the company structure
- Be able to evaluate the suitability and application of current in-house PLC/SCADA systems and offer guidance and advise on whether such systems may be modified or improved
- Consequently be able to leverage their skills to potentially cause an increase within the plant or process in terms of overall productivity and efficiency through analysis of current systems
- Be better equipped to advise on new system communication installations in terms of evaluating choices between radio and wire based telemetry systems
- Potentially through their newly acquired knowledge and understanding of PLC systems and their integration into a SCADA system using a variety of digital communication standards and telemetry links be able to advise system designers, thereby negating or at least reducing the dependency on external agencies and vendors
- Therefore potentially contribute towards and result in plant and process cost reductions leading to financial savings for the company

## Personal Impact

**The delegate will benefit personally from attendance of this seminar and will enhance their own knowledge base and level of confidence in the area of PLC,**

**SCADA and Telemetry systems. Specifically the delegate will be able to:**

- Return to their organisations equipped with new skills and knowledge that will enable them to understand, analyse, and optimise their own plant requirements in terms of PLC and SCADA systems
- Design, construct, download and evaluate PLC programs written in a standard programming language to meet a given specification
- Develop a working knowledge of basic and advanced PLC and SCADA programming techniques
- Predict the suitability of a Radio telemetry system by a study of the terrain under investigation and by gaining a knowledge of the operating parameters of the frequency bands available
- Make informed decisions on methods of conveying data from RTU's by an acquired understanding of commonly used wire based data communication protocols such as RS232 and RS485
- Upgrade their level of confidence in PLC based systems and determine the appropriateness of new system design in terms of PLC/SCADA or a DCS configuration

## Who Should Attend?

**This seminar is suitable for and is designed to attract and be of benefit to a range of people who work in the Control and Instrumentation process and plant areas. Typically but not exclusively this seminar will be of benefit to:**

- Electronic Engineers and Technicians
- Electrical Engineers and Technicians
- Control Engineers and Technicians
- Communication Engineers and Technicians
- I.T. 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

# Seminar outline

### Module 1

### Introduction to Control Strategies

- Continuous Control systems
- Sequential Control systems
- Relay based systems

### Practical Session 1

- Relay based programming examples

### Introduction to PLC Systems

- PLC v relay systems
- Programming formats
- Logical continuity

## Practical Session 2

- Software familiarisation
- Introduction to industry standard PLC programming software
- Construction of test programme

## Module 2

## PLC architecture

- System architecture
- Memory and I/O types
- Scanning algorithms
- Program Scan cycle

## Radio Telemetry Systems

- Introduction
- Elements of a Radio Link
- The radio spectrum
- Frequency ranges
- System design considerations

## Practical Session 3

- Serial transfer of Programs
- Design exercise 1

## Module 3

## PLC Programme Development

- Analysis of PLC programs

- Design methodology and development of PLC programs
- Timer method of program development

### Practical Session 4

- Design exercise 2. - Program design of Process Controller

### Serial Data Communications

- Communication methods (Simplex, Half-Duplex, Full-Duplex)
  - RS232 standard
  - RS422 standard
  - RS485 standard

### Practical Session 5

- Sequence Controller and Application boards

### Module 4

### Analogue I/O and Processing

- Analogue inputs
- A/D and D/A conversion
- Programming analog modules and advanced instructions
- Implementing PID control using a PLC

### Introduction to SCADA

- System architecture
- Configuration and operation

### Practical Session 6

- Introduction to industry standard SCADA software
- Design and development of a new SCADA project

## Module 5

## PLC/SCADA v DCS systems

## Practical Session 7,8

- Design and development of a new SCADA project (continued)
- Case Study – An Industrial Process
- Consolidation of Previous practical activities

**The Scandinavian Academy for Training Center** adopts the latest scientific and professional methodologies in training and human resource development, aiming to enhance the efficiency of individuals and organizations. Training programs are delivered through a comprehensive approach that includes:

- Theoretical lectures supported by PowerPoint presentations and visual materials (videos and short films).
- Scientific evaluation of participants before and after the program to measure progress and knowledge acquisition.
- Brainstorming sessions and practical role-playing to simulate real-life scenarios.
- Case studies tailored to align with the training content and participants work nature.
- Assessment tests conducted at the end of the program to evaluate the achievement of training objectives.

Each participant receives the training material (both theoretical and practical) in printed form and saved on a CD or flash drive. Detailed reports, including attendance records, final results, and overall program evaluations, are also provided.

Training materials are prepared professionally by a team of experts and specialists in various fields. At the end of the program, participants are awarded a professional attendance certificate, signed and accredited by the Scandinavian Academy for Training Center.

**Program Timings:  9:00 AM to 2:00 PM**

**The program includes:**

- A daily buffet provided during the sessions to ensure participants comfort.
- A closing ceremony on the final day to distribute certificates and celebrate participants achievements.
- **Note: All prices are exclusive of 15% Value Added Tax (VAT).**

# Our Success Partners

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