SCADA in Action: From Architecture to Applications

40 Hours

Course Description

The SCADA course is designed to provide students with a comprehensive understanding of SCADA systems and how to use WinCC software to develop and configure them. The course provides a comprehensive introduction to SCADA (Supervisory Control and Data Acquisition) systems, their architecture, configuration, and practical implementation. Participants will gain a solid understanding of SCADA's role in industrial automation, data acquisition, and real-time monitoring. The course covers essential topics such as project creation, basic configuration, alarm management, data logging, trend analysis, recipe management, user administration, and more. Through a combination of theoretical instruction and hands-on exercises, participants will be equipped with the knowledge and skills needed to design, implement, and manage SCADA systems effectively.

Audience

This course is designed for professionals working in the field of industrial automation, control systems, and process engineering. It is suitable for:

- Engineers and Technicians in the automation industry
- Control Systems Designers and Integrators
- Process Engineers and Operators
- System Administrators
- Maintenance Engineers

Pre-requisite Knowledge/Skills

Participants are expected to have a basic understanding of industrial automation concepts, including PLCs (Programmable Logic Controllers) and industrial networking. Familiarity with Windows-based operating systems and basic programming concepts will be advantageous but is not mandatory.

Course Objectives

By the end of the course, participants will be able to:

- Describe the architecture and components of a SCADA system
- Create and configure SCADA projects, devices, and connections
- Set up graphic views and configure text displays
- Implement alarm management and configuration
- Configure data logging and trend analysis

- Manage recipes and implement recipe-based processes
- Administer user access and permissions within a SCADA system
- Perform practical exercises that reinforce theoretical concepts
- Apply SCADA fundamentals to real-world industrial automation scenarios
- Upon completion of this course, participants will have a strong foundation in SCADA system concepts and will be well-equipped to contribute to the design, implementation, and operation of SCADA systems in various industries.

Course Outline

The course comprises of 7 modules. The duration of the course is 40 hours.

Module 1: Introduction to SCADA

- SCADA Overview
- What is SCADA?
- Functions of SCADA
- Example of SCADA architecture
- Data Acquisition and Communication
- Data acquisition methods
- Data communication in SCADA systems
- Data presentation and visualization
- Comparison of PLC and PC
- Examples of SCADA Applications

Module 2: Project Creation & Basic Exercises

- Creating a SCADA Project
- Adding Devices to the Project
- Establishing Communication Connections
- Setting Ethernet Addresses
- Connecting to Non-Integrated PLCs
- Runtime Settings Configuration
- Configuring Buttons and Outputs
- Basic Exercises related to Push Buttons and Displays

Module 3: Basic Configuration

- Configuring Graphic Views
- Setting Up Text Displays
- Alphanumeric Display for Inputs and Outputs

- Configuring Text and Graphic Lists
- Movement and Fill Properties

Module 4: Alarm Configuration

- Steps in Alarm Configuration
- Message Blocks for Alarms
- Alarm Classes
- Discrete Alarm Trigger Settings
- Displaying Alarms
- Alarm View Properties
- Practical Exercises on Alarm Configuration

Module 5: Data Logging & Trend Configuration

- Types of Process Value Logging
- Configuring Data Logs
- Process Value Log Properties
- Editing Logging Tags
- Displaying Data Log Trend Views
- Properties of Trend Views
- Practical Exercises on Data Logging and Trend Configuration

Module 6: Recipe Management

- Recipe Structure
- Communication with Controllers using Tags
- Table Representation of WinCC Recipe View
- Sorting in the Recipe View
- Exporting Recipe Data
- Configuring Recipe Views
- Entering and Editing Recipe Data
- Recipe Editor Configuration
- Setting Recipe Properties
- Practical Exercises on Recipe Management

Module 7: User Administration

- User Administration Structure
- Access Protection Mechanisms

- Configuring User Administration
- Structuring User Authorizations
- Creating Authorizations
- Assigning Authorizations to Objects
- Configuring User Groups
- Configuring Users
- User View Configuration
- Login Dialog Configuration
- Displaying Logged-On Usernames
- Practical Exercises on User Administration