Integrated Training Program: SCADA, Communication, and Control Systems: PART A

Course Description

This comprehensive training program offers a deep dive into SCADA (Supervisory Control and Data Acquisition) systems, covering fundamental concepts, practical applications, and hands-on exercises. Participants will gain a thorough understanding of SCADA architecture, data acquisition, visualization, alarm configuration, data logging, recipe management, and user administration. The course integrates theoretical knowledge with practical skills, preparing learners to design, implement, and manage SCADA systems effectively.

Audience

This course is designed for professionals and students interested in industrial automation, control systems engineering, and related fields. It is suitable for:

- Control system engineers
- Automation engineers
- Electrical engineers
- Instrumentation engineers
- System integrators
- Technicians
- Engineering students

Pre-requisite Knowledge/Skills

Participants are expected to have a basic understanding of control systems and industrial automation concepts. Familiarity with PLCs (Programmable Logic Controllers) and computer networking fundamentals would be beneficial but not mandatory.

Course Objectives

Upon completion of this training program, participants will be able to:

- Understand the fundamentals of SCADA systems and their components.
- Create, configure, and manage SCADA projects effectively.
- Implement data acquisition, visualization, and alarm systems in SCADA.
- Set up data logging and trend configuration for monitoring and analysis.
- Manage recipe data efficiently for process control and optimization.
- Administer user access and permissions within SCADA systems.

Course Outline

- Module 1: Introduction to SCADA
    - SCADA Overview
    - What is SCADA?
    - Functions of SCADA
    - SCADA Architecture
    - Data Acquisition and Communication
    - 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