TIA Portal Basics of Siemens PLC Programming

32 Hours

Course Description

The Siemens PLC Programming Course is a comprehensive training program designed to equip participants with the knowledge and skills needed for Siemens SIMATIC S7-1200 PLC programming. This course encompasses essential concepts, programming techniques, and hands-on exercises to foster proficiency in designing, configuring, and troubleshooting industrial control systems. Participants will gain practical skills in programming logic controllers for various automation applications.

Audience

This course is ideal for:

- Electrical engineers
- Automation engineers
- Control system technicians
- Maintenance professionals
- Industrial automation enthusiasts
- Students pursuing careers in industrial automation.

Pre-requisite Knowledge/Skills

Participants should have a basic understanding of industrial automation concepts and electrical circuits. Familiarity with PLC hardware and software will be beneficial but is not mandatory.

Course Objectives

Upon completion of this course, participants will be able to:

- Understand the fundamentals of Siemens SIMATIC S7-1200 PLCs.
- Develop PLC programs for various automation tasks.
- Implement motor control in both manual and automatic modes.
- Utilize IEC timers and counters for precise control.
- Diagnose and troubleshoot PLC programs and hardware.
- Configure and use web-based diagnostics for remote monitoring.
- Work with analog signals for precise control of processes.
- Create and manage global data blocks for efficient data handling.

Course Outline

Module 1: Introduction to PLCs

- What is a PLC?
- Advantages of PLCs
- Applications of PLCs
- Overview of Siemens PLCs

Module 2: Siemens PLC Hardware Overview

- PLC Components and Architecture
- Siemens PLC Product Lineup
- Understanding PLC Inputs and Outputs

Module 3: STEP 7 Software Introduction

- Overview of STEP 7 Software
- Introduction to TIA Portal
- Basic Interface Navigation

Module 4: PLC Programming Basics

- Overview of Programming Languages (Ladder Logic, Function Block Diagrams, Structured Text)
- Addressing and Data Types in Siemens PLCs
- Basic Programming Instructions

Module 5: Creating a Simple PLC Program

- Setting up a New Project
- Creating Tags and Variables
- Writing and Downloading a Basic Program

Module 6: Working with Timers and Counters

- Introduction to Timers and Counters
- Programming Timers and Counters in Siemens PLCs

Module 7: Program Control Instructions

- Flashing Concept
- Memory mapping

Module 8: Data Handling Instructions

- Overview of Data Handling Instructions
- Moving, Comparing, and Converting Data

Module 9: Analog Input and Output Handling

- Understanding Analog Inputs and Outputs
- Configuring Analog Modules
- Programming Analog Signals

Module 10: Communication Protocols
- Introduction to Communication Protocols in Siemens PLCs
- Profibus, Profinet, and Ethernet Communication
- Configuring Communication Settings