BOOST
THE LEADING TRAINING PROVIDER

Instrumentation & Controls

Advanced PLC Programming and Troubleshooting

Course Introduction

Advanced PLC Programming training course is directed and focused on personnel involved in project engineering tasks who would like to become proficient with the extended programming possibilities of SIMATIC S7 (300/400).

Target Audience

- Programmers
- Commissioning engineers
- Configuring engineers
- Instrumentation and control engineers
- Maintenance engineers
- Electrical engineers
- Those responsible for Project engineering tasks and who would like to develop familiarity with the extended programming possibilities of SIMATIC S7 (300/400).

Learning Objectives

- Leverage and influence the power of Block and Function libraries
- Use STL for advanced program development
- Employ indirect addressing in a program
- Incorporate System Functions (SFC) in a program
- Use Instance and Multi-Instance data Blocks
- Use and practice interrupt-driven and error processing program execution blocks
- Leverage STEP7 advanced diagnostics

Course Outline

- **01 Day One**

  MODULE 1: SIMATIC S7-300/400 Programmable Controller

    - Structure and Configuration of the Programmable Controller (Hardware Components of S7-300/400)
    - Memory Areas
    - Distributed I/O (PROFIBUS DP)
    - Communications (Subnets)
    - Modules Addresses
    - Addresses Areas

  MODULE 2: Review of Start-up and Operation

    - Starting STEP 7
    - Starting STEP 7 with Default Start Parameters
    - Calling the Help Functions
    - Objects and Object Hierarchy
    - User Interface and Operation
    - Keyboard Operation

- **02 Day Two**

  MODULE 3: Data Blocks and complex variables

    - Blocks Overview
    - Blocks in Structured Programming
    - The Multi-Instance Model
    - FB 1-4 Parameter Descriptions
    - Block Connections
    - Parameter passing

MODULE 4: Complex Data Type Applications

- Data Types and Variables
- Complex Data Types
- Using Arrays, Strings, Date & Time
- Using STRUCT
- User-Defined Data Types (UDTs)
- Structure programs

• **03 Day Three**

MODULE 5: Program control

- STL and managing the accumulators for S7300/400
- Status word and jump instructions
- Loop command and breakpoints
- Organization Blocks
- Parameter Passing with FC, FB, SFB, SFC
- Parameter passing: Local variable
- Library blocks: SFCs and SFBs
- Parameter passing with user-designed FCs
- Parameter passing with user-designed FBs
- Multi-Instance FB

MODULE 6: Block Calls & Parameters

- Parameter Declarations & Passing
- Pointer and Any Data Types
- Calling Functions
- Description of Examples

• **04 Day Four**

MODULE 7: Error Handling

- Synchronous Errors
- Asynchronous Errors
- System Diagnostics
- Error Handling Organisation Blocks (OB70 to OB87 / OB121 to OB122) ·
- Masking Synchronous Errors SFC 36-38
- Applying Error Filters

MODULE 8: IEC Functions

- Conversion and Comparison Functions
- STRING Functions
- Date/Time-of-Day Functions
- Numerical Functions

• **05 Day Five**

MODULE 9: Troubleshooting the automation system

Troubleshooting with a module information tool

Troubleshooting with a hardware configuration tool

Hardware Diagnostics and Troubleshooting

Module Information

Troubleshooting with CPU messages

Diagnosing in STOP Mode

Inspecting and Checking Scan Cycle Times to Avoid Time Errors

The flow of Diagnostic Information

Program Measures for Handling Errors

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
May 26, 2025	May 30, 2025	5 days	2150.00 $	Virtual - Online
Aug. 4, 2025	Aug. 8, 2025	5 days	4250.00 $	UAE - Dubai
Nov. 17, 2025	Nov. 21, 2025	5 days	4950.00 $	Indonsia - Jakarta
Feb. 3, 2025	Feb. 7, 2025	5 days	4250.00 $	UAE - Dubai