



Consulting and Training | Reach New Heights

Course Name

Advanced PLC Programming and Troubleshooting

Sector Name

Instrumentation & Controls

Document Type

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Advanced PLC Programming and Troubleshooting

Course Introduction

The 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).

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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).

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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

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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

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Course Outline

✓ 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

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Course Outline

✓ 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



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Course Outline

✓ 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

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Course Outline

✓ 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

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
May 24, 2027	May 28, 2027	5 days	4250.00 \$	UAE , Dubai
March 14, 2027	March 18, 2027	5 days	4250.00 \$	Qatar , Doha
Nov. 23, 2026	Nov. 27, 2026	5 days	4950.00 \$	Indonesia , Jakarta
Aug. 9, 2027	Aug. 13, 2027	5 days	4250.00 \$	UAE , Dubai

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