



Instrumentation & Controls

PLC Training & Siemens S7 (PLC's)

Course Introduction

This course has been developed to give participants an understanding of programmable Logic Controllers (PLC's) systems and their applications in Industrial Automation Systems (IAS) extensively within the Oil & Gas, Petrochemical, Power Generation, Water/Waste Water Treatments, Pharmaceutical, Food and beverage, Transportation, Pulp and Paper and other Process Industries. The course will cover in details fundamental principles, architectures and definitions of the PLC's and their connectivity with different known electric and automation control system components.

In additional, a detailed discussion of PLC's hardware structure components, I/O modules, intelligent modules, communication protocols, installation, maintenance & Troubleshooting. The course also includes a study of the PLC's basic programming languages (Function Block Diagram, Ladder, Statement List and the key software Tools), basic programming instructions, configuration of the application program, Uploading & Downloading of the application program, testing, monitoring, modifications and troubleshooting of the application program etc.

Target Audience

- Control & Instrumentation Engineer
- Controls Technologist
- Instrumentation Technician / Systems Control Tech
- Senior Control & Instrumentation Engineer
- Maintaining Equipment Engineer
- Facilities I&E / Controls Engineer
- Offshore Instrumentation Engineer

Learning Objectives

- Evaluate the suitability and application of current in-house Siemens S7 PLC systems and offer guidance and advise on whether such systems may be modified or improved, consequently
- Will be able to leverage his skills to potentially cause an increase within the plant or process in terms of overall productivity and efficiency through analysis of current systems,
- Will be better equipped to advise on new system installations in terms of evaluating choices between different industrial automation systems.

Course Outline

• 01 Day One

Module (01) Background to Programmable Logic Controllers

- 1.1 Introduction to Control Systems Environments
- 1.2 Introduction and brief history of PLC's
- 1.3 Fundamental principles of the PLC systems
- 1.4 Hardware structure of the PLC systems
- 1.5 PLC Hardware and system configurations
- 1.6 PLC Input /Output Modules
- 1.7 Intelligent PLC Modules
- 1.8 Remote I/O and Distributed Structure
- 1.9 PLC Memory Types, Structure & Capacity
- 1.10 PLC Memory Organization and Interaction
- 1.11 Processor Scan & PLC Scan Cycle
- 1.12 PLC Selection Criteria

• 02 Day Two

Module (02) Fundamental of the PLC Software

- 2.1 Programming Devices
- 2.2 Methods of Representing Logic in PLC's

- 2.3 Standard programming Tools and Utilities
- 2.4 PLCs Standard and Programming Languages
- 2.5 Numbering Systems and Conversions
- 2.6 PLC addressing standard
- 2.7 Register Word Format
- 2.8 Bit Logic Instruction
- 2.9 Timers and Counters Instructions
- 2.10 Instruction Code and Graphical Presentation
- 2.11 PLC Instruction Libraries
- 2.12 Special Function Instructions
- 2.13 Network Communication Instructions
- 2.14 Program Flow Control Concept

• **03 Day Three**

Module (03) Editing, Monitoring, Diagnostic, Modifying and Forcing Variables

- 3.1 Editing a Project
- 3.2 Configuration of the PLC Stations
- 3.3 Arranging and Assignment Parameters
- 3.4 PLC Modules Addressing
- 3.5 Symbolic Editing Concept
- 3.6 System Diagnostic
- 3.7 PLC Program Verification
- 3.8 Downloading the Program to the CPU
- 3.9 Testing and Diagnostic of the User Program
- 3.10 Monitoring, Modifying and Forcing Variables
- 3.11 Program Status Concept
- 3.12 PLC Program Documentations

• **04 Day Four**

Module (04) PLC Practical Application Siemens S7 Family - Maintenance and Troubleshooting

- 4.1 Basics of Siemens S7- PLC's Family Overview
- 4.2 Introduction to Simatic Manager
- 4.3 Siemens Simatic S7 Hardware Components
- 4.4 Siemens Simatic S7 Hardware Addressing
- 4.5 Basics of Siemens Structure Programming Language
- 4.6 Block Programming Concept
- 4.7 Basics of Siemens Manager – Step 7 Programming Software
- 4.8 Editing, Modifying, Testing, Diagnostic & Forcing of the PLC application Program

- 4.9 Assigning Symbols Names to Objectives
- **05 Day Five**

4.10 HMI for Process Control

- 4.11 Analog Value Processing
- 4.12 System Diagnostics
- 4.13 Backing Up the Project
- 4.14 Application Examples

Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
July 30, 2025	Aug. 3, 2025	5 days	4950.00 \$	England - London
Oct. 29, 2025	Nov. 2, 2025	5 days	4250.00 \$	UAE - Dubai
Dec. 22, 2025	Dec. 26, 2025	5 days	4250.00 \$	UAE - Dubai
Feb. 24, 2025	Feb. 28, 2025	5 days	4250.00 \$	UAE - Abu Dhabi
Oct. 5, 2025	Oct. 9, 2025	5 days	4250.00 \$	Oman - Muscat