

3-Day Siemens PLC & TIA Portal Core Training

Primary platforms

- Siemens TIA Portal
- Siemens S7-1200 and S7-1500 PLCs
- Siemens Basic / Comfort HMIs

Training format

- Instructor-led, hands-on
 - Live PLC and HMI hardware
 - On-site or local classroom delivery
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Day 1 – Siemens Hardware, TIA Portal, and Communications

Siemens automation overview

- Siemens PLC family overview
- Differences between S7-1200 and S7-1500
- Typical applications and selection guidelines

TIA Portal fundamentals

- Project creation and navigation
- Device view vs network view
- Project organization concepts

PLC hardware configuration

- Adding and configuring S7-1200 and S7-1500 CPUs
- Selecting I/O modules
- Addressing and diagnostics
- Power, grounding, and wiring best practices

Networking and communications

- Ethernet and PROFINET fundamentals
- Assigning IP addresses
- Downloading and going online
- Online monitoring and basic diagnostics

Hands-on lab

- Create a new TIA Portal project
 - Configure PLC hardware
 - Establish communications with PLC
 - Verify I/O and CPU operation
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Day 2 – PLC Programming Fundamentals and Function Blocks

Siemens programming model

- Organization Blocks (OBs) overview
- Functions (FCs) vs Function Blocks (FBs)
- Data Blocks and instance concepts

Programming basics

- Ladder Logic and Function Block Diagram
- Digital I/O handling
- Timers, counters, and comparisons
- Status monitoring and forcing

Function Blocks fundamentals

- Why Siemens uses Function Blocks
- Creating and using FBs
- Instance Data Blocks
- Reusable code concepts

Hands-on lab

- Build a simple machine or process sequence
 - Implement logic using FBs
 - Monitor and troubleshoot logic online
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Day 3 – HMI Integration, Program Organization, and Best Practices

Siemens HMI integration

- Basic vs Comfort panel overview
- Creating an HMI within TIA Portal
- PLC-HMI tag integration

HMI development basics

- Screens, buttons, indicators, and alarms
- Operator interaction best practices
- Alarm and status display fundamentals

Program organization and standards

- Folder structure and naming conventions
- Tag naming and documentation
- Modular program design

Troubleshooting and diagnostics

- Online diagnostics tools
- Common PLC and HMI faults
- Commissioning and startup best practices

Hands-on lab

- Build an HMI to control and monitor the PLC program
- Apply organization and documentation standards
- Simulate faults and perform troubleshooting

Training outcomes

After this 3-day class, participants will be able to:

- Configure and connect Siemens S7-1200 and S7-1500 PLC hardware
- Navigate and build projects in TIA Portal
- Create and use Function Blocks effectively
- Develop structured, maintainable PLC programs
- Integrate PLCs with Siemens HMIs
- Troubleshoot common PLC and HMI issues