

# Online Instructor-led Training

## AB to S7 with TIA Portal - Virtual

### General Information

Course Code: SCT-PTOILABSP1A  
Length: 5 Days - 5 hours per day

### Audience

This course is for experienced AB programmers interested in an advanced training on Siemens SIMATIC S7 PLC family and STEP7 engineering software.

### Profile

2.5 CEUs (Continuing Education Credits)

This virtual course acknowledges the automation experience of the students and delivers must-know, advanced topics to experienced engineers interested in Siemens SIMATIC STEP 7 TIA Portal software. This course moves engineers / programmers quickly into the power of the STEP 7 TIA Portal engineering tool. Multiple STEP 7 program editors are presented demonstrating the flexibility and fully integrated features of STEP 7.

The course teaches Siemens STEP7 Software recognizing the previous experience students have with Allen-Bradley platforms. The instructor has familiarity with AB platforms and software from which they directly relate to the questions and experiences of students in the class.

This course concentrates on STEP 7 software, program structures, System Functions, advanced block libraries and custom block design. STEP 7 engineering tools and programming instructions are demonstrated to guide the student through the development of a realistic application. The course format consists of instruction, demonstration, and hands-on exercises. Students utilize test, debug and diagnostic tools to complete extensive programming exercises.

Access to fully functional software, virtual tools, and exercises are provided to each participant through a cloud-based application.

### Objectives

*Upon completion of this course, the student shall be able to:*

- Utilize STEP 7 TIA Portal engineering tools
- Insert an HMI device into a project
- Locate Tags using Cross-Reference tool
- Utilize System Diagnostic Functions to test and troubleshoot an application program.
- Create custom code blocks
- Create reusable program code (FB, DB, FC, etc.) and insert in Library
- Assign tags in STEP 7 TIA Portal
- Create, Store, and Retrieve Library Objects

### Topics

1. System Overview
  - a. Engineering Systems
  - b. Software Framework
  - c. System Tools
2. AB-STEP 7 TIA Portal Navigation
  - a. Control System Overview
  - b. Devices and Networks
  - c. Project View
  - d. Program View
3. AB-STEP 7 TIA Portal Communication
  - a. Communications Terminology
  - b. TIA Portal Online Communication
  - c. Accessible Devices
  - d. Downloading Projects
4. Hardware
  - a. STEP 7 TIA Portal Hardware Configuration
  - b. Adding Modules
  - c. I/O Assignments
  - d. Remote I/O
  - e. Networking in STEP 7 TIA Portal
5. Memory Allocation and Usage
  - a. Memory Management
  - b. Basic Formats
  - c. Data Block Memory
  - d. Local Memory
6. Tag Handling
  - a. STEP 7 TIA Portal Tags
  - b. Tag Attributes
  - c. Assigning Tags
  - d. Adding Tags
  - e. Import/Export of Tags
7. Program Instructions in STEP 7 TIA Portal
  - a. Inserting, Deleting, and Populating a Network
  - b. Changing an Instruction Type
  - c. Network viewing, commenting, copy/paste/move
  - d. Boolean (bit) instructions
  - e. Compare, Timer, Counter, and Math Instructions
  - f. Conversion, Moves, Word logic, Jumps and MCRs instructions
  - g. Creating re-usable Instructions
8. Programming Blocks
  - a. FB, DB, FC, OB, SFC, and SFB in STEP 7 TIA Portal
  - b. Installing Blocks
  - c. Viewing Blocks
  - d. First Scan OBs
  - e. Hardware Interrupts
  - f. Error Handling OBs
  - g. Creating re-usable blocks

9. HMI
  - a. HMI Programming in STEP 7 TIA Portal
  - b. Supported Devices
  - c. Inserting a Comfort Panel in a Project
  - d. Creating and Editing Screens
10. Reference Data
  - a. Cross-Reference Tool in STEP 7 TIA Portal
  - b. Assignment List
  - c. Call Structure View
  - d. Program Structure Filtering
11. System Diagnostics
  - a. Diagnostic Tools in STEP 7 TIA Portal
  - b. CPU Status View
  - c. System Alarms
  - d. Hardware Diagnostic Tools
  - e. Watch Tables
  - f. Force Tables
  - g. Online Monitoring
12. Simulation
  - a. Simulation in STEP 7 TIA Portal
  - b. PLC Simulation
  - c. HMI Simulation
13. Library Options
  - a. Library Options in STEP 7 TIA Portal
  - b. What is a Library?
  - c. Project Libraries
  - d. Global Libraries
  - e. Calling from a Library