

Automation - SIMATIC S7 with STEP 7 v5

Programming 1 with Virtualization

General Information

Course Code: SCT-S7VIRP1A

Length: 4½ Days

Audience

This course is for SIMATIC S7-300/400 PLC users who are involved with developing or sustaining automation systems and their application programs.

Profile

3.2 CEUs (Continuing Education Credits)

This course is the first in a three part series which builds basic programming skills with Siemens STEP7 software. Students will learn S7 project management, program design and application development. This is an aggressively paced curriculum covering the S7 programming editor with Ladder, Function Block Diagram, and Statement List programming languages, and key software tools. This course takes a systems approach to the S7300/400 PLCs, plus basic connectivity and functionality of an HMI and PROFIBUS remote I/O.

Throughout this course students will build a STEP7 project from the beginning, learning proper program structure and documenting. Software diagnostic tools will be used for debugging both hardware and code. Various instruction sets, memory areas, program blocks, and libraries will be introduced to provide the student with solid concepts of structured programming.

The course format consists of instruction and hands-on exercises. The course uses a conveyor model for realistic demonstrations and exercises.

SUGGESTED PREREQUISITE:

Introduction to PLCs and Languages

Objectives

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

- Complete a system hardware configuration.
- Build, document, test and troubleshoot a structured STEP7 program.
- Commission a PLC system: Main station, Remote station, HMI, Conveyor
- Program using the multiple address types.
- Use symbolic addressing.
- Use core application instructions, functions and blocks.
- Program using the processed analog values.
- Generate data blocks.
- Establish connections to an HMI system.

Topics

1. STEP 7 Family Overview
2. Introduction to SIMATIC Manager
3. Hardware Configuration Tool
 - a. Hardware configuration and addressing
 - b. Building the main rack configuration
 - c. Configuring the PROFIBUS Network
4. Monitor/Modify Tool
5. Commission a PLC system: Main station, Remote station, HMI, Conveyor
6. Programming with STEP 7
 - a. Structured programming
 - b. Memory images and management
 - c. Introduction to Ladder Logic
 - d. Introduction to Function Block Diagram
 - e. Introduction to Statement List
7. Assigning symbol names to Objects
8. Introduction to HMI and WinCC Flexible software
9. Software catalog elements
 - a. Timers: S7 and IEC
 - b. Counters: S7 and IEC
 - c. Working with Numbers
10. System diagnostics
 - a. Reference Data tool
 - b. Module Information tool
 - c. Troubleshooting
11. Analog value processing
12. Backing up the project
 - a. Archive and retrieve
 - b. Transferring project to memory module in PLC