

Automation - SIMATIC S7 with STEP 7 v5

S7 System Tools & Troubleshooting 2

General Information

Course Code: SCT-S7300S2B
Length: 4½ Days

Audience

This course is for SIMATIC S7-300-400 PLC users with basic SIMATIC control system knowledge who install or maintain automation systems and their application programs.

Prerequisites

- S7 System Tools & Troubleshooting 1

Profile

This course continues skill development in troubleshooting and modifying a control system. Participants will use STEP7 software tools to build new features, diagnostics and communications into the application project. Program development using organization blocks, system functions and instruction libraries build software troubleshooting efficiency. Analog signal processing and alarming are included in this application. Configuration and integration of an HMI and drive system into the student's application project builds experience managing a complete automated control system.

The course format consists of instruction and hands-on exercises. Students will use test, debug and diagnostic tools to complete the commissioning, programming and system integration exercises.

Objectives

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

- Be familiar with ways you can use different block types (FC, FB, OB, and DB).
- Become familiar with the principles of analog value processing.
- Eliminate software errors that lead to a CPU stop.
- Eliminate logical software errors, such as multiple assignments.
- Save and document program changes that have been made.
- Use the data block access functions.
- Access and use the processed analog values.

Topics

1. Hardware and Software Commissioning - review
 - a. Status indicators
 - b. Hardware configuration

- c. Memory management
 - d. CPU properties
 - e. Programming structure
 - f. Symbols
 - g. Variable tables
2. Data Storage in Blocks
 - a. Elementary data types
 - b. Complex data types
 - c. Addressing data elements
 - d. Accessing data elements
 3. Functions and function blocks
 - a. Temporary variables
 - b. Formal parameters
 - c. Editing and calling a parameter-assignable block
 - d. Instance Data Blocks
 4. Organization Blocks
 - a. OB types and library
 - b. OBs for cold and warm restarts
 - c. Cyclic and hardware interrupts
 - d. Error OBs
 - e. Diagnostics OBs
 5. Analog processing and programming
 - a. Analog module addressing
 - b. Analog input signal conversion
 - c. Analog output signal conversion
 - d. Scaling of analog to engineering values
 6. Troubleshooting
 - a. Error categories
 - b. Debugging tools
 - c. System diagnostics
 - d. Diagnostics buffer
 - e. Diagnostics with Stacks (I, B, L)
 - f. Hardware diagnostics
 - g. Using S7 variable table monitoring features
 - h. Monitor, modify and force variables
 - i. Using cross-references
 7. System information
 - a. Module Information Scan, Time, Performance
 8. MPI Network Commissioning
 - a. Using accessible nodes
 - b. Establishing communications - NetPro
 - c. CPU messages
 9. Tags and HMI Messages
 - a. Establishing communications
 - b. Assigning and editing tags
 - c. Pointers for alarms and messages
 10. Drive System Commissioning
 - a. Establishing communications
 - b. Control and status words
 - c. Drive diagnostic basics