

STEP 7 v5 Programming with SCL

General Information

Course Code: SCT-S7OILSCLP1A

Length: 10 Hours

Audience

This course is for engineering and maintenance personnel, who create, diagnose and troubleshoot SIMATIC STEP7 applications with Structured Control Language (SCL) content.

Prerequisites

- S7 Programming 1

Profile

1.9 CEUs (Continuing Education Credits)

This course provides an in depth look at STEP7 programming and program troubleshooting with a focus on the Structured Control Language (SCL) - a PASCAL-similar high-level text language for programming mathematical algorithms, data management and organization tasks for Siemens automation systems.

Students should have a solid working knowledge of STEP7, SIMATIC Manager and the basic diagnostics and editor tools. This is a hands-on course filled with programming exercises in SCL. Students will use advanced software tools of STEP7 including PLCSIM to complete system integration programming, troubleshooting, and functional testing of applications.

This is a live, instructor led, on-line course delivered in 2-hour learning modules through an innovative web application. Access to fully functional STEP 7 software will be provided to the student through a cloud-based application. Students are encouraged to complete assigned lab exercises during and after each session to reinforce the learning modules throughout the week. A professional Siemens instructor will also be available to answer student questions outside of scheduled class times.

Objectives

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

- Efficiently use the SIMATIC Manager program editor tools.
- Use the STEP7 program monitor, diagnostics and troubleshooting tools.
- Build and modify SCL programs.
- Package an SCL program into a custom library block and use within a STEP7 project.
- Explore the SCL syntax requirements and the system debug functions.
- Use PLCSIM software to simulate PLC hardware and test user defined SCL program code.

Topics

1. The SIMATIC Manager
 - a. Project Structure
 - b. Offline/Online Views
 - c. STEP 7 Help System
 - d. Creating a Variable Table
2. SCL Overview
 - a. SCL Defined
 - b. Supported Block Types
 - c. SCL Editor
 - d. Compile, Debug and Troubleshooting SCL code
 - e. Download and Program Test
3. SCL Program Structure
 - a. Block call order
 - b. Local Instances of FBs
 - c. Global Data Blocks
 - d. Instance Data Blocks
 - e. Adding Code comments
4. SCL Syntax
 - a. Keywords and Identifiers
 - b. Assignment Statements
 - c. Conditional Statements
 - d. Control Statements
 - e. OK Flag
5. SCL Data Types
 - a. Elementary Data Types
 - b. Complex Data Types
 - c. User Defined Data Types
 - d. Data Types for Parameters
 - e. Constants and Jump Labels
6. SCL Declarations
 - a. INPUT Parameters
 - b. OUTPUT Parameters
 - c. IN_OUT Parameters
 - d. STATIC and TEMP Variables
 - e. CONSTANTS
7. SCL Mathematical and Logical Operations
 - a. Arithmetic Operations
 - b. Comparison Operators
 - c. Logical Operators
 - d. Standard Functions
 - e. Conversion Functions
 - f. Numerical Functions
8. SCL Control Instructions
 - a. IF, Then Instructions
 - b. CASE Instruction
 - c. FOR Instruction
 - d. WHILE Instruction
 - e. REPEAT Instruction
 - f. CONTINUE Instruction
 - g. EXIT, RETURN, and GOTO Instructions