

## TIA Portal Safety Sustaining

### General Information

Course Code SCT-PTSFTP2A  
Global Code TIA-SAFETY  
Length 2 Days  
CEUs 1.3

### Audience

This course is for SIMATIC S7 TIA Portal PLC users who install or maintain automation safety systems and their application programs.

### Prerequisites

- TIA Portal Programming 1
- OR
- TIA Portal Service 1 AND TIA Portal Service 2

### Profile

This course introduces the student to a Siemens Distributed Safety PLC application. Participants build skills on commissioning, troubleshooting and upgrading an automation safety system. Functional safety principles, sensor-actuator connections, device configuration of the S7-1500F and ET 200SP are covered, as well as restoring the system and programming the safety blocks. The course format is a combination of instruction and hands-on exercises. A realistic model is used for demonstrations and student exercises. Exercises allow students to practice tasks such as testing, debugging and using diagnostic tools.

### Objectives

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

- Describe global and US Machine Safety Standards.
- Identify TIA Portal safety components.
- Remove and replace S7-1500 and ET200SP safety components.
- Identify safety components using the wiring diagrams of the S7-1500 and ET200SP.
- Configure S7-1500 safety component hardware.
- Diagnose S7-1500 safety component LEDs.
- Address S7-1500 safety components.
- Understand the structure of an S7-1500 safety program.
- Troubleshoot Hardware Configuration to identify system faults.
- Use Watch Tables to monitor I/O modules.

- Troubleshoot the status of program logic.

### Topics

1. Overview Machine Safety Standards
  - a. Terminology and concepts associated with Safety Systems.
  - b. Differences between control and safety systems.
  - c. Different applications, types, and standards of safety systems.
2. Product Overview
  - a. SIMATIC Safety history
  - b. SIMATIC Safety in TIA Portal V13
  - c. TIA Portal – STEP 7 Safety Advanced
  - d. Configurable hardware
  - e. SIMATIC S7-1500F CPUs
  - f. SIMATIC ET200SP Overview
3. Functional Safety Integrated Principle
  - a. Operating Principle of Safety Integrated.
  - b. Hardware and firmware safety concepts
  - c. Safety-related communication with PROFsafe
4. Sensor-actuator connection
  - a. Selecting correct Base Unit for ET200SP, F-PM and F-RQ
  - b. Mounting and addressing an ET200SP
  - c. 1oo1 Evaluation for SIL1 or PLC
  - d. Wiring examples
  - e. F-Power module
  - f. Actuator connection
  - g. Emergency Stop
  - h. Help with the use of safety technology
  - i. Optional information and additional modules
5. Device Configuration
  - a. F-System configuration and parameters F-System CPU and ET200SP.
  - b. Understand the F parameters and their function.
6. Configuring and wiring the S7-1500F and ET200SP
7. System Restore and Safety Blocks Programming
8. Testing and Diagnostics
  - a. Acceptance of a system
  - b. Safety printout
  - c. Which steps are mandatory?
  - d. Replacing hardware and software components
9. Fail-safe communication