

TIA University- Motion Test Track V19

General Information

Event Code: TBD
Length: 1 Day

Audience

This event is for Project Engineers and Automation Specialists developing control system architectures (PLC Projects) that require the use of **Motion Control**. This workshop introduces the fundamental aspects of integrating Motion Control technology in TIA Portal and applying Totally Integrated Automation concepts in accordance with recommended best practices.

The event assumes experience in other manufacturers' product and in the overall knowledge of automation system engineering, applications, and the associated tasks required to implement a solution.

Profile

Prerequisite for this event is a solid background in automation system engineering, including PLC configuration and programming, HMI configuration, and integration of these components into a system-centric solution.

This event introduces the primary hardware and software products from Siemens, including the TIA Portal engineering framework, Startdrive, SIMATIC S7-1500 Technology PLCs for Motion, Sinamics drives, PLCSim, and TIA Selection Tool.

This event is virtual (no live hardware). PLCSim or PLCSim Advanced with TIA Portal is used for completing the lab exercises.

Required Registration Prerequisite: Must have attended TIA Test Drive or Merge Logix with TIA Portal virtual workshop.

Learning Objectives

Upon completion of this event, student shall be able to:

- Complete a dual axes hardware configuration in the context of a Scenario Based Learning exercise using the TIA Selection tool to create a Motion Control Production Machine Architecture.
- Develop and expand structured STEP7 program using standard motion libraries & PLCSim or PLCSim Advanced to test, debug & evaluate code.
- Use Motion Technology Objects and PLCopen blocks for motion commands.
- Integrate HMI Faceplates

Study Guide Topics

Motion Overview

Learning Objectives

1. Different types of electric motors
2. SINAMICS product family
3. Difference between an open-loop and a closed-loop control
4. Difference between an absolute encoder and an incremental encoder
5. How to configure and commission a drive in TIA Portal
6. What are Technology objects in TIA Portal?
7. How to program motion control commands?

Motion Basics

Basics of Drives

1. Basics of electric motors
2. Basics of frequency converters
3. Basics of encoders
4. Basics of Profidrive communication

Motion Technology Introduction

1. Speed Axis
2. Position Axis
3. Gearing: Relative and Absolute
4. Camming
5. Kinematics (Robotics)

Hands on Exercises

Motion Focus

- TIA Portal Project to include: S71511 T-CPU, Sinamics S210 and Unified Panel
- Drive configuration with Sinamics S21
- Complete a series of labs using a practical scenario-based learning exercise.
- Exercises with Technology Objects: TO_PositioningAxis, TO_SynchronousAxis, TO_Cam, and TO_Kinematics
- Working with Standard Axis Library (LAxisCtrl)
- Download & test in simulation mode.