

Attention: The following topics are **not** addressed during this class:

- Motion Control
- TwinSAFE
- Fieldbuses not described in the topics below

Prerequisite:

Basic knowledge of a windows operating system (OS) and the ability to manage files and folders.

Topics Covered

Documentation – Catalog and Information System

- I/O and Bus coupler Diagnostics
- Hardware Identification
- EtherCAT I/O Hardware
- K-Bus
- Terminal Wiring
- Grounding
- Power Rail
- Replacing Terminals
- Bus Coupler LEDs

eXtended Automation Architecture

TwinCAT Overview - Using the Visual Studio IDE

Scanning/Communicating with Hardware

Using the System Manager as a troubleshooting tool

Troubleshooting EtherCAT networks

Troubleshooting K-bus networks

IPC Diagnostics

Connecting PLC Variables to Hardware

- Linking the PLC Variables to Hardware
- Simple PLC Program – Connecting inputs and outputs

Variables

- Variable Types
- Declarations
- Variable Scope

- Initial Values
- Constants
- Persistent Data

Languages of the PLC

- IL – Instruction List
- LD – Ladder Diagram
- FBD – Function Block Diagram
- SFC – Sequential Function Chart
- UML – Unified Machine Language (State Chart)
- CFC – Continuous Function Chart
- ST – Structured Text

Loading and Running the PLC

- Changing Code

Pragmas

Structures

Enumerations

Arrays

Functions

- Standard
- User Created

Function Blocks

- Standard
- User Created

Code Sequencing and POU Calls

Introduction to OOP

Libraries

- Adding Beckhoff Libraries
- Versions
- User created

Troubleshooting PLC Code

Break Points

- Flow Control
- Global Search
- Cross Reference

Boot Project

TwinCAT Measurement

Project Compare

Downloading from the Web

Licensing

Remote Connections