BECKHOFF New Automation Technology

Training information

Training

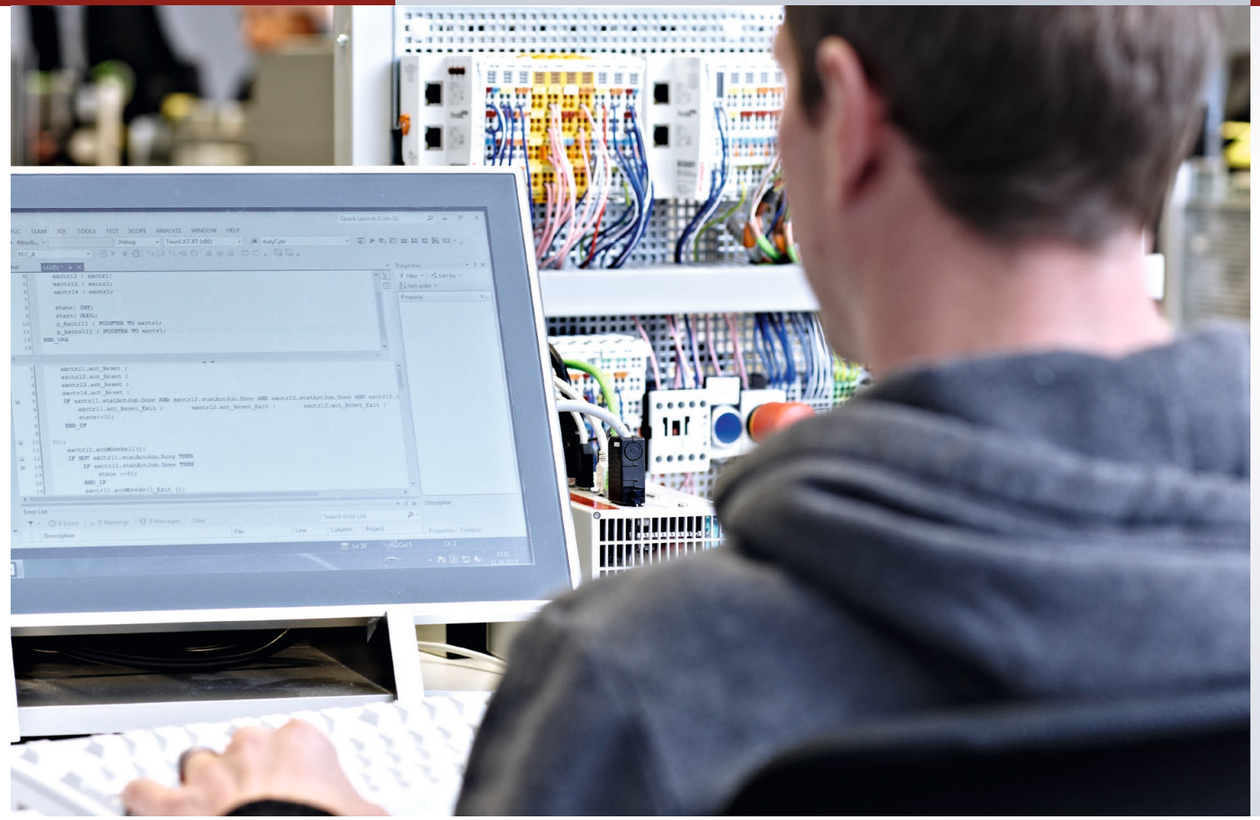
Contents

Beckhoff UK offer a selection of training courses for our products and technologies. Covering the topics found in the document below, these courses can be held at our regional training centers or at customer premises.

Please note that we offer both traditional classroom and online training courses to best suit your needs.

In addition to the standard training courses, we also offer – among other things – training courses with specialised content, based on your individual needs. The content of these courses will be discussed directly with you.

Please contact
training@beckhoff.co.uk
for more information.



IEC 61131 TwinCAT 3 PLC programming

Overview

This course focusses on PLC programming and hardware configuration using the TwinCAT 3 platform. Participants will learn about PLC programming with TwinCAT 3 and how to configure the hardware of a system using the Visual Studio shell. The training is based on the IEC 61131-3 standard. Advanced options such as object-oriented extensions of the IEC standard, module generation in C++ or high-level language visualisation interfaces are deliberately not included.

Goals

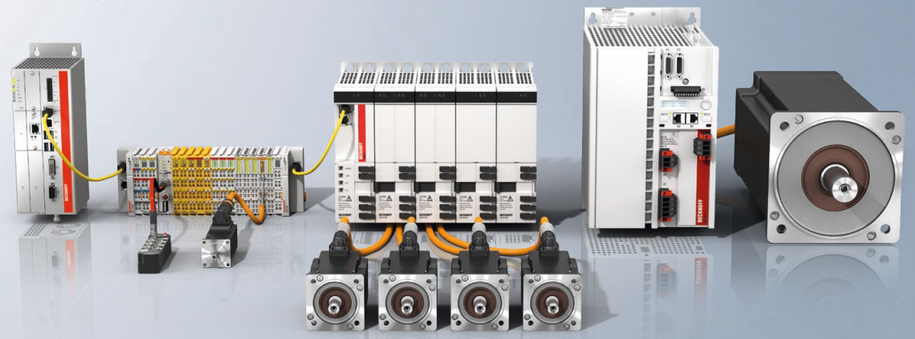
Understand the particular parts of TwinCAT 3 studied:

- navigate TwinCAT 3 Visual Studio shell
- navigate and configure TwinCAT Scope
- configure fieldbus and hardware
- understand ADS
- understand how to use the Beckhoff documentation
- fault-finding using Beckhoff documentation by applying the correct document to the fault
- be able to recreate the programs/systems studied after the completion of the course

Training code	TRUK3030-1000
Duration	2 days, taking place from 9:15 a.m.–5:00 p.m.
Prerequisites	Knowledge of programming and PC literacy

Agenda	
Day one	– TwinCAT 3 installation – Quick start – Visualizations – Programming basics
Day two	– Programming basics continued – Measurement projects – Deploying on to real hardware – EtherCAT configuration and diagnostics

For information on the TwinCAT 3 PLC online training course see page 7.



IEC 61131 TwinCAT 3 C++ module programming

Overview
This course focusses on the use of C++ as a development language for TwinCAT Realtime. Participants will learn how to create and use C++ driver projects to create the TcCOM objects executed in TwinCAT Realtime. They will learn how to adapt these objects to suit different scenarios and cover debugging and online change capabilities.

Goals
Understand the constituent parts of the C++ implementation:
- using the project and TMC wizards
- navigate the generated files and folders of the projects
- bringing IO and user types into a project
- fault-finding using the Realtime debugging facility
- perform code changes using the online change function
- cover 64-bit driver signing using Tc Sign

Training code	TRUK3042-1000
Duration	1 day, taking place from 9:15 a.m.–5:00 p.m.
Prerequisites	C++ proficiency and understanding of TwinCAT

Agenda

- Overview of TwinCAT TcCOM objects
- Requirements and limitations of C++ programming in TwinCAT 3 real-time environment
- Develop program from simple quick start to include files and user library
- C++ TwinCAT 3 environment and wizards

IEC 61131 TwinCAT 3 point-to-point motion control

Overview
This training focusses on the topic of TwinCAT NC PTP positioning. The target group consists of users who are familiar with programming with TwinCAT PLC and who now wish to familiarise themselves with the TwinCAT NC extension.

Goals
Understand the particular parts of TwinCAT studied:
- navigate TwinCAT System Manager
- creation of TwinCAT NC axis
- navigate TwinCAT PLC Control
- navigate TwinCAT Software Scope
- identify Beckhoff IO components (hardware and software)
- be able to recreate the programs/systems studied after the completion of the course by applying the correct document to the fault
- be able to recreate the programs/systems studied after the completion of the course

Training code	TRUK3050-1000
Duration	1 day, taking place from 9:15 a.m.–5:00 p.m.
Prerequisites	Assured handling of TwinCAT PLC programming or attendance of TwinCAT PLC 2-day course. Understanding of motion control.

The course will include

- Motion control (MC) blocks: standardisation of axis functions, simplifications in the use of the MC blocks, advantages for programming and maintenance
- Programming examples
- NC Commissioning Interface, Drive Manager 2, Basic Servo Drive Tuning

Agenda

Additional to the main TwinCAT course

- NC commissioning interface
- Commonly used parameters
- PLC Control of the NC
- Drive commissioning and tuning

TwinSAFE with TwinCAT 3

Overview
This course is designed to give you a firm foundation of knowledge on TwinSAFE hardware and software. TwinSAFE architecture concepts and practical examples of safety projects are covered throughout the course to aid you in the design and completion of your first TwinSAFE project.

Goals
Understand the particular parts of TwinSAFE studied:

- identify Beckhoff TwinSAFE IO components (hardware and software)
- identify which architecture you require for your project
- navigate TwinCAT 3 and TwinSAFE
- be able to create both digital based and analogue based safety logic diagrams

Training code	TRUK3068-1000
Duration	1 day, taking place from 9:15 a.m.–5:00 p.m.
Prerequisites	TwinCAT 3 PLC, except in special circumstances

Agenda	
	– Introduction to the TwinSAFE concept – Introduction to the TwinSAFE editor – Configuring a basic TwinSAFE project – How to diagnose your project – Configuring an extended TwinSAFE project with analogue safety

TE2000 TwinCAT 3 HMI programming

Overview
The focus of this training course is to provide fundamental knowledge of the web based TwinCAT 3 HMI. Participants will be guided through building a sample HMI project, allowing them to familiarise themselves with the engineering environment, learn key development concepts and get an overview of the tools and features included in the HMI.

Goals
Understand the particular parts of TwinCAT 3 HMI studied:

- navigate TwinCAT 3 HMI from within Visual Studio
- understand design principles using Beckhoff controls
- connect to a PLC program and interact with variables form the HMI
- understand HMI logic developed through a graphical interface
- design re-useable elements where possible
- develop and deploy your own HMI project after the course

Training code	TRUK7050-1000
Duration	2 days, taking place from 9:15 a.m.–5:00 p.m.
Prerequisites	Basic knowledge of HMI design and PLC theory

Agenda	
Day one	– Overview of HMI architecture and technology – Introduction to controls in the toolbox – Triggering events in the HMI – Symbols and data binding from the PLC – Re-usable elements, induding user controls and action templates
Day two	– Themes – Publishing to the HMI Server – Archiving and trending – Language handling – User management – Alarms and events

TwinCAT 3 Vision

Overview

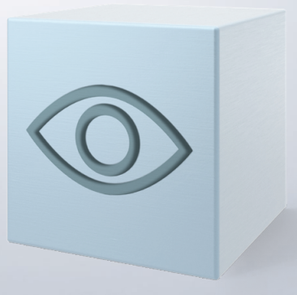
In this course you will learn the basics of TwinCAT Vision, how to connect cameras, work with offline file sources and make use of the TwinCAT 3 Vision libraries. At the end of the course you will know the structure and working method of TwinCAT Vision and will be able to solve your first image processing tasks independently.

Goals

- Understand to the functionality of TwinCAT Vision
- System design using Beckhoff IPC and GIGE Vision Cameras
- create TwinCAT Vision configurations, using GIGE Cameras and File source
- use the TwinCAT Vision library
- create and execute sample code based the 3 core TwinCAT 3 Vision Libraries, Code reading, Measurement and matching.

Training code	TRUK3090-1000
Duration	2 days
Prerequisites	Completed TwinCAT 3 PLC Course, Basic understanding of Machine Vision System is recommended

Agenda	
Day one	– Beckhoff TwinCAT 3 Vision Overview – TwinCAT 3 Vision Realtime philosophy – Using online resource and documentation – TwinCAT 3 Vision Library overview – Using the TwinCAT 3 Vision API – Camera Configuration – Offline image configuration – Sample Development – Code Reading
Day two	– Sample Development – Blob detect – Sample Development – Edge analysis – Sample Development – Colour detection



Further course availability, training pricing and TwinCAT 3 online training

Overview

Further courses are available on demand.

- IEC61131 TwinCAT 2 PLC programming: An introduction to structured programming and TwinCAT 2 (2 days)
- IEC61131 TwinCAT 2 PLC maintenance: Beckhoff hardware and software maintenance and fault finding (1 day)

Other customised workshop days are available to give assistance to customers by providing focussed and targeted training and application support.

An online version of the TwinCAT 3 PLC training is available via our online training portal. This costs £200/€225 per delegate and gives you 14 days of access to the Beckhoff UK training portal.

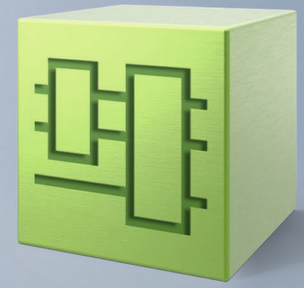
For further information on this course please contact **training@beckhoff.co.uk**

Training pricing

Our training sessions are priced at £750/€850 per delegate per day, with discounts for groups and multi-day training courses. Please email us at **training@beckhoff.co.uk** for information on available discounts. We look forward to welcoming you and your team.

Online training

Modules covered in this course are:
– General PLC architecture
– TwinCAT architecture
– ADS
– TwinCAT installation
– First project
– Setting the cycle time
– Simulation
– IEC61131-3 program layout
– Programs
– Function blocks
– Functions
– Conditions
– Structures and arrays
– Loops
– TwinCAT Measurement project
– Interfacing with hardware
– EtherCAT



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