QTE TRAINING

ANNUAL PROGRAMME 2025

FROM MAINTAINER TO EXPERT

Electrical maintenance
Mechanical maintenance

www.QTE-Training.de

QTE TRAINING

YOUR PARTNER FOR SUCCESSFUL MAINTENANCE

Are you looking for a partner for efficient and reliable training on machines and systems?

With our 14 years of expertise, we are the leading independent experts for training in maintenance. and Our practice-orientated training courses and seminars provide your employees with the necessary know-how. Our qualified trainers are qualified by many years of practical experience and successful projects.

Your needs are our challenge. Rely on the expertise of QTE Training to ensure that your team is trained in an optimal way.

“There is only one thing that is more expensive than education in the long run: no education.”

John F. Kennedy

I am pleased to present the new QTE Training catalogue!

Further training is more important than ever.

At a time when in-depth training is crucial to a company’s success, we have expanded and improved our range of training programmes for your maintenance staff in order to meet the increasing demands of the industry. With our focus on practical training for maintenance, we want to ensure that your employees have the necessary expertise to meet todays and tomorrow’s technical challenges.

Thanks to our strategic reorganisation and investments in development and hardware, we can now respond even more specifically to the needs of our customers. We support them with a modular training concept and we are proud to now train thousands of enthusiastic maintenance technicians in their specialised field every year. We are once again looking forward to accompanying your maintenance staff on their way to becoming experts in the new year.

QTE Training is ready for 2025 and to support you and your team on the road to a successful future!

Bettina Jacobi

CEO | QTE Training GmbH

CONTENT

HYDRAULICS

PNEUMATICS

CROSS PRODUCT TRAININGS

TRAINING ACCORDING TO DGUV

APPRENTICE ACADEMY

OUR TRAINING PROGRAMME
FOR YOUR SUCCESS

Our experience

Our trainers have many years of experience in their fields of expertise. In addition, all of them have successfully completed further training to become lecturers or teachers. It is particularly important to us, that our trainers are always up to date with the latest knowledge. They therefore regularly take part in external seminars and workshops to improve their rhetorical and didactic skills. In this way, we ensure that all QTE Training instructors are able to convey complex content with a good balance of theory and practice.

Inhouse – we come to you!

A training course can be conveniently and easily conducted directly at your company, provided a training room is available. The QTE Inhouse Training concept offers the opportunity to hold sessions on-site. A trainer will bring all the necessary equipment, while the organization of participants is managed internally – QTE's team takes care of everything else.

Take advantage of our attractive fixed-price conditions.

Customer satisfaction

... is very important to us! To ensure the quality of our training sessions, all participants evaluate their personal success at the end of a course. An independent company analyzes the feedback forms completed by the participants. The results help us to continuously optimize our services. Based on this feedback, we can implement improvements and embrace new ideas.

Small training groups for optimum learning success

To ensure that all participants learn optimally, we only work in small groups with **a minimum of 4 and a maximum of 8 participants**. In this way, we can serve specific needs and also have the time to deliver a deeper explanation if required!

English training courses

As an international training provider for control technology, hydraulics and pneumatics, we also offer all our training courses in English, conducted by our qualified trainers.

We offer manufacturer-independent training

Our training courses are manufacturer-independent and enable neutral, versatile training that is not limited to specific manufacturer products or technologies. This allows comprehensive knowledge and skills to be imparted which can be used flexibly and across different applications.

Apprentice Academy

In view of the increasing demands in the industry, there is less and less time during training to learn various specialist areas in a practical manner. With our AZUBI AKADEMIE programme, we prepare your trainees optimally for the maintenance of tomorrow.

more on this on p. 72

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QTE Trainingsbox

The QTE training box offers the opportunity to deepen the knowledge acquired in the training courses and to consolidate it through practical exercises in self-study.

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Online Schulungen

Our online training courses offer flexibility. Documents and access, such as to the TIA Portal, are conveniently available via the cloud platform. Faults and errors can be simulated and rectified using a digital system model, similar to the face-to-face training sessions. Participation in the online training courses is straightforward via MS Teams. Minimum effort- maximum learning success!

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LEGEND

- MODULAR TRAINING UNIT
- IN-HOUSE TRAINING
- TRAINING IN ENGLISH
- ONLINE TRAINING
- TRAINING AT QTE TRAINING

MODULAR TRAINING PROGRAM

FOR YOUR MAINTENANCE

Our **new** training program for maintenance focuses on practical handling and methodical troubleshooting. This modular program has been designed to provide comprehensive training for professionals – both after initial training or for career changers in maintenance.

GOALS & BENEFITS

Prevent skilled labor shortages

Through targeted training, companies can optimally train and further educate their skilled workforce to avoid personnel shortages.

Reduction of downtime

Improved troubleshooting and problem-solving lead to shorter machine and equipment downtime, making operational processes more efficient.

Increase in effectiveness and competitiveness

The program helps to increase the efficiency of maintenance processes, thereby strengthening the company‘s global competitiveness.

The modular structure of the programs allows the content to be flexibly adapted to the needs of the company and employees, enabling targeted and effective training.

CERTIFIED QTE TRAINING MAINTENANCE EXPERT

PLC OR HYDRAULICS/PNEUMATICS

Level 1

BASIC Course

3-4 days

Level 2

ADVANCED Course

3 Tage

Level 3

EXPERT Course*

2 days

Methodical troubleshooting *(see page 60)*

2 days

Certified QTE Training Maintenance Expert

*

In Level 3, participants can focus on the following modules of the training program:

Expert | ***PLC***
Expert | ***Hydraulics***
Expert | ***Pneumatics***

Level 3 offers the opportunity to deepen knowledge and complement it with a course in methodical troubleshooting.

SIEMENS

PRODUCT TRAINING

As a global market leader, Siemens provides comprehensive solutions for the automation of machinery and plants in industry. These solutions are used as a global standard in almost every automated company. The advantages of Siemens controllers lie in the high reliability and stability of their systems.

SIMATIC S5
MAINTENANCE AND SERVICING

TARGET GROUP

Maintenance personnel | Commissioning staff | Service technicians

REQUIREMENTS

- Basic knowledge of Microsoft Windows and digital technology

DESCRIPTION | IMPLEMENTATION

QTE Training shows maintenance personnel transitioning from S7-Classic or TIA Portal how to downgrade to SIMATIC S5 and to rediscover almost extincted technologies like working with floppy disks and discs. This includes an introduction to the world of the old SIMATIC S5 standard.

The SIMATIC S5 Maintenance and Service course provides basic knowledge about the structure of automation systems, their configuration, and parameterization.

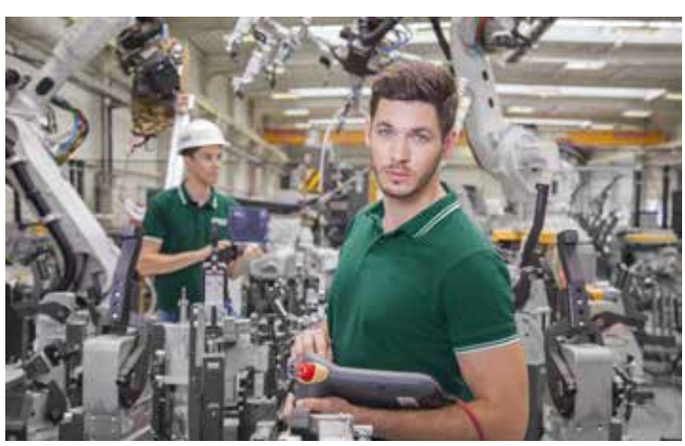
The course covers handling STEP 5 software, the basics of programming, and troubleshooting. Theoretical knowledge is deepened through numerous practical exercises on a system model, enabling participants to directly apply what they have learned in practice.

CONTENT

- Structure of SIMATIC S5 automation devices
- Basics of DOS/Windows – relevant differences
- Hardware structure
- Connecting a programming device
- Communication setup with the programming device
- SIMATIC S5 on Windows 10 (alternatives to Siemens)
- Program structure in a SIMATIC S5
- Fault diagnosis
- Data blocks and data formats
- Parametrizable function blocks
- Supplementary operations
- Analog value processing
- Sequence control systems

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People



S7 V5.x
COMMISSIONING

TARGET GROUP

Commissioning Personnel | Service Technicians

REQUIREMENTS

- Solid knowledge of Windows operating systems
- Basic knowledge of digital technology

DESCRIPTION | IMPLEMENTATION

This training provides a guide for the commissioning of PLC programs created with the SIMATIC Manager. It also covers knowledge on fault diagnosis and localization of typical plant malfunctions using STEP7 diagnostic functions.

The training content is discussed in multimedia format and deepened with practical examples. There is an opportunity to apply the newly acquired knowledge hands-on with automation devices S7-300 and a simulation model.

CONTENT

- Methodical approach to the commissioning of systems whose PLC programs are created with the SIMATIC Manager
- Commissioning of systems realized with PROFINET
- Identifying and correcting typical hardware and program errors
- Verification options for correct functionality
- Identifying errors in the parameterization of PROFINET devices
- Access to the methodical use of tools such as cross-reference lists, observation tables, and diagnostic buffers for effective testing and identifying problems in program flow

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

S7 V5.x
MAINTENANCE AND SERVICING

BASIC

TARGET GROUP

Maintenance Personnel | Commissioning Personnel | Service Technicians

REQUIREMENTS

- Previous knowledge of Microsoft Windows and digital technology

DESCRIPTION | IMPLEMENTATION

Employees in maintenance are often confronted with various devices from different manufacturers. This training, in addition to the knowledge of the existing systems, provides a secure understanding of the software used. By teaching common PLC programming functions, it provides a solid foundation for more efficient troubleshooting.

The training content is discussed in multimedia format. Typical application examples and simple programming exercises deepen the theoretical knowledge.

There will be ample opportunity to apply the newly learned knowledge in practice on S7-300 automation systems and to simulate it.

CONTENT

- Getting familiar with hardware components of the SIMATIC S7 family
- Working with the software interfaces SIMATIC Manager, hardware configuration, symbol editor, variable table, cross-reference list, and KOP/FUP as well as AWL editor
- Building S7 programs in these editors
- Direct and symbolic addressing
- Integrating modules via Profibus-DP
- Loading and interpreting programs
- Getting familiar with functions, function blocks, and data blocks
- Familiarization with arithmetic and conversion functions
- Troubleshooting program errors using cross-reference list, variable table, and CPU diagnostic buffer
- Fault finding and troubleshooting on the practice model
- Brief introduction to WinCC flexible

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

S7 V5.x
MAINTENANCE AND SERVICING

ADVANCED

TARGET GROUP

Maintenance Technicians | Commissioning Personnel | Service Technicians

REQUIREMENTS

- Knowledge from the contents of the QTE training:
- ‚SIMATIC S7 - Maintenance and Service I Basic‘ or comparable qualifications

DESCRIPTION | IMPLEMENTATION

This training serves to refresh the knowledge already acquired in the basic course and provides a comprehensive guide to localizing typical system faults using STEP 7 diagnostic functions as well as efficient troubleshooting in Profibus configuration.

Typical application examples are used to deepen theoretical knowledge. Sufficient opportunities are provided to apply the newly acquired knowledge in practice on S7-315 automation devices and a simulation model.

CONTENT

- Refresh of S7 Troubleshooting Skills
- Typical Fault Types: Hardware, Program, Logical, and Sporadic Errors
- Guidelines for a Methodical Approach to Efficient Troubleshooting
- Localization of System-Specific Faults
- Diagnostic Options with Fault Organizational Blocks
- Identifying and Fixing Malfunctions Using an Exercise Model
- Applying STEP 7 Diagnostic Functions
- Resolving Configuration Errors on the PROFIBUS
- Familiarization with Fault Organizational Blocks

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

S7 V5.x
SCL (STRUCTURED CONTROL LANGUAGE)

TARGET GROUP

Programmers | Designers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Advanced basic knowledge Step 7 V5.x

DESCRIPTION | IMPLEMENTATION

In this training, learning advanced skills is provided to work with complex STEP 7 programs. This includes the dedicated handling of error OBs to reveal faults, for example, on the HMI, CPU/CPU communication, as well as an example of using an integrated drive. This provides participants with better tools for troubleshooting in more complex projects.

The training content is explained in multimedia format and deepened through application examples. Participants have the opportunity to apply the newly acquired knowledge in practice using S7-300 automation devices, HMI TP 177, and the SINAMICS G120 drive unit.

CONTENT

- Creating SCL source files > generating > creating blocks
- Declaration of variables in SCL
- Working with SCL online
- Debugging information (Debug Info)
- Keywords in SCL
- Structure of FC (Function Blocks) and FB (Function Block) > interface + code
- Declaring SCL variables
- Using functions IF and CASE
- Inserting SCL blocks from libraries
- Calling IEC timers
- Inserting blocks from templates
- Resolving translation errors

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

S7 V5.x PROGRAMMING

TARGET GROUP

Programmers | Designers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Basic knowledge of programming comparable PLC types
- Knowledge of digital technology | PC and Microsoft Windows skills

DESCRIPTION | IMPLEMENTATION

An overview of the functional capabilities of the Siemens SIMATIC S7 PLC family is provided, along with an introduction to the programming, structure, and documentation of SIMATIC S7 V5.x.

The training content is discussed in multimedia form and deepened through typical application examples. There will be ample opportunity to apply the newly acquired knowledge practically with automation devices S7-300 and STEP 7 V5.x.

CONTENT

- Product categories of the SIMATIC S7 family
- Handling of the SIMATIC Manager software interfaces
- Structured programming and commenting with Step7
- Entering, reading, and interpreting a simple program
- Programming and testing functions, function, data, and organizational blocks
- Direct and symbolic addressing
- Configuration and parameterization of the CPU
- Working with the diagnostic buffer
- Arithmetic instructions and conversion functions
- Error and interrupt OBs
- Indirect addressing
- Pointers & IEC timers
- Creating DB from text files
- S7 300 web server
- Importing and exporting code/DB content from and to MS Excel™ tables

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

S7 V5.x
DISTRIBUTED SAFETY

TARGET GROUP

Maintenance Technicians | Service Technicians | Programmers | Designers

REQUIREMENTS

- Participation in a QTE training:
- ‚S7 V5.x - Maintenance and Service I Advanced‘ or comparable qualifications

DESCRIPTION | IMPLEMENTATION

An insight is provided into the functionality, diagnostics, troubleshooting, programming, and commissioning of Distributed Safety. This also includes the fail-safe central modules of the S7-300F and S7-400F, as well as the fail-safe decentralized ET200 systems.

The content is conveyed through multimedia and deepened by typical application examples. There is ample opportunity to apply the newly acquired knowledge practically on an S7-300F automation device and a simulation model.

CONTENT

- Overview of standards and guidelines
- Principle, system structure, and peripherals of a SIMATIC S7-300F
- Programming of a safety-oriented user program
- Distributed Safety- project planning of the fail-safe peripherals
- Diagnostic possibilities (CPU diagnostics, peripheral diagnostics, advanced diagnostic tools)
- Communication, fault-finding in peripheral setup
- Exercises on peripheral setup
- Examples of programming (programming specifics, emergency stop, safety door, safety shutdown, deactivation)
- Identification of possible errors based on a practice model
- Project planning of a fail-safe peripheral with Distributed Safety
- Fault-finding in peripheral setup

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

S7 V5.x
GRAPH SEQUENTIAL FUNCTION CHART

TARGET GROUP

Maintenance Technicians | Service Technicians | Programmers | Project Engineers

REQUIREMENTS

- Participation in a QTE training:
- ‚S7 V5.x - Maintenance and Service I Basic‘ or comparable qualifications

DESCRIPTION | IMPLEMENTATION

This training provides knowledge in the area of S7 GRAPH. Participants will learn how to design and commission sequential control systems.

The training content is presented in multimedia format. The course strikes a balanced approach, combining theoretical tasks with practical exercises on models. The training uses STEP 7 V5.5 with S7-Graph Professional 2010 SR4 V5.3 and S7-315 controllers.

CONTENT

- Technological tasks related to sequential control systems:
- Creating a sequence chain with S7 Graph
- Transition-controlled branching
- Parameterizing actions in steps
- Programming transitions
- Programming monitoring and interlocking
- Commissioning and testing functions
- Creating a program for a simulation model

COURSE DURATION
1 day

MINIMUM PARTICIPANTS
4 People

TIA- COMMISSIONING

TARGET GROUP

Commissioning personnel | Service technicians

REQUIREMENTS

- In-depth knowledge of Windows operating systems
- Basic knowledge of digital technology

DESCRIPTION | IMPLEMENTATION

This training provides a guide for commissioning PLC programs created in the TIA Portal. It covers knowledge of fault diagnosis and the localization of typical system malfunctions using the STEP7 diagnostic functions.

The training content is presented in a multimedia format and deepened through practical examples. Participants will have the opportunity to apply the newly acquired knowledge in practice using automation devices from the S7-1500 series and a simulation model.

CONTENT

- Methodical approach to the commissioning of systems whose PLC programs are created with the TIA Portal
- Commissioning of systems implemented with PROFINET
- Identifying errors in the parameterization of PROFINET participants
- Recognizing and resolving typical hardware and programming errors
- Access to the methodical use of tools such as cross-reference lists, observation tables, and diagnostic buffers for effective testing and identification of issues in program flow

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

TIA
MAINTENANCE AND SERVICING

BASIC

TARGET GROUP

Maintenance Technicians | Service Technicians

REQUIREMENTS

- In-depth knowledge of Windows operating systems
- Basic knowledge of digital technology

DESCRIPTION | IMPLEMENTATION

This course provides the necessary fundamentals for working with Siemens TIA Portal. Practical examples will provide basic user knowledge needed to operate the software confidently.

The training‘s learning objective is focused on methodical troubleshooting.

The training content will be discussed in multimedia format. Typical application examples will deepen the theoretical knowledge. There will be ample opportunity to apply the newly acquired knowledge hands-on with S7-1500 series automation devices and to work with a simulation model.

CONTENT

- Getting familiar with hardware components of the SIMATIC S7-TIA family
- Working with the TIA Portal software interface
- Building S7 programs in KOP/FUP
- Local and global variables
- Using online functions of the TIA Portal
- Setting up a PROFINET network
- Entering, reading, and interpreting programs
- Getting familiar with functions, function blocks, and data blocks
- Introduction to arithmetic and conversion functions
- Identifying and resolving error sources using observation tables, diagnostic buffers, and cross-reference lists
- Identifying and fixing malfunctions using a practice model
- Brief introduction to the integrated WinCC Basic
- Simulation model with step chain

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

OUR TIP

Take advantage of the opportunity to save costs by booking both **BASIC** and **ADVANCED** courses as a package.

TIA
MAINTENANCE AND SERVICING

ADVANCED

TARGET GROUP

Maintenance Technicians | Service Technicians

REQUIREMENTS

- Advanced basic knowledge in the TIA Portal or participation in a QTE training:
- ‚TIA - Maintenance and Service I Basic‘ or comparable qualifications

DESCRIPTION | IMPLEMENTATION

This training is designed to refresh existing knowledge from the course ‚TIA - Maintenance and Service I BASIC‘. It provides in-depth knowledge on fault and troubleshooting. It also refreshes and deepens the previously acquired knowledge.

The training content is discussed in multimedia form. Common application examples are used to acquire theoretical knowledge, which is then applied practically to a simulation model for further deepening.

CONTENT

- Refreshing knowledge on troubleshooting in the TIA Portal:
- Typical types of faults
- Recognizing errors in hardware and programs
- A guide to a methodical approach for efficient troubleshooting
- Getting familiar with diagnostic tools for error detection
- Identifying and fixing malfunctions using a practice model
- Applying diagnostic functions in the TIA Portal
- Getting familiar with error organization blocks
- Configuration of PROFINET participants

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

TIA
SCL (STRUCTURED CONTROL LANGUAGE)

TARGET GROUP

Programmers | Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

Advanced basic knowledge in TIA Portal
Participation in a QTE training:
‚TIA - Maintenance and Service I Basic‘

DESCRIPTION | IMPLEMENTATION

Employees are increasingly confronted with systems programmed in Structured Control Language (SCL). This training provides an insight into SCL. After completing the course, participants will be able to navigate through complex programs and quickly locate errors.

Boolean logics will be formed, calculations will be made with numerical values, and functions and function blocks will be called.

The training content is discussed multimodally. Theoretical knowledge is deepened by creating typical application examples. There will be ample opportunity to apply the newly acquired knowledge practically with automation devices of the S7-1500 series and on a simulation model.

CONTENT

- Basic functions IF ... THEN ... ELSEIF
- Arithmetic operations with numeric values
- Edge detection according to IEC with R_TRIG
- Assign, Set, Reset in SCL
- Calling function blocks in SCL
- Calling functions and handling return values in SCL
- Jump instruction GOTO
- Case differentiation with CASE ... OF
- Time elements TON, TOF in SCL
- State machine with step number as Integer
- Declaring strings in TIA (1500 PLC)
- Introduction to string functions
- Edge detection in SCL using IF
- Applying slice access in SCL
- String functions LEN, FIND, etc.
- Loops FOR, WHILE and break with EXIT
- Calculator with ring buffer
- Multidimensional arrays
- Nesting loops

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

OUR TIP

This training is part of our modular further education concept for QTE Maintenance Expert training.

TIA PROGRAMMING

TARGET GROUP

Planners | Programmers | Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Participation in a QTE training:
- ‚TIA - Maintenance and Service I Basic‘
- Knowledge of TIA Portal
  or comparable qualifications

DESCRIPTION | IMPLEMENTATION

A deeper insight into structured programming with the TIA Portal is provided. This includes Sequential Function Charts / Graph.

The training content is delivered in a multimedia format. The theoretical knowledge is further deepened through practical exercises.

CONTENT

- Handling the software interface of the TIA Portal
- Configuring the hardware of a Siemens 1500-series station
- Structured programming and testing of functions and function blocks
- Creating global DB and custom data types
- Programming and interpreting GRAPH step chains
- Creating more complex programs
- Arithmetic instructions and conversion functions
- Working with different data types (INT, REAL, TIME, ARRAY,...)
- Alarm-controlled program editing
- Integrating external devices via GSD files
- Creating and interpreting more complex programs
- Working with advanced mathematical functions
- Slice access
- Programming with SCL
- Strings and Structs
- Error evaluation

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

CHANGEOVER COURSE FROM SIMATIC S7 V5.X TO THE TIA PORTAL

TARGET GROUP

Commissioning Personnel | Programmers | Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Basic knowledge of programming with SIMATIC S7 | Knowledge of digital technology
- Knowledge about PC and Microsoft Windows are required.

DESCRIPTION | IMPLEMENTATION

In this course, the main distinguishing features between SIMATIC S7-300 / 400 and SIMATIC S7-1500, as well as the engineering tools SIMATIC Manager and TIA Portal, are taught. The project planning and advanced programming possibilities of the SIMATIC S7-1500 automation system with the engineering platform TIA Portal are learned.

The training content is discussed in a multimedia format. Typical application examples deepen the theoretical knowledge. There will be ample opportunity to apply the newly acquired knowledge practically with automation devices from the S7-1500 series.

CONTENT

- Engineering Tools TIA Portal: SIMATIC STEP 7 and SIMATIC WinCC Basic
- Introduction to the SIMATIC S7-1500 hardware
- Configuration of devices and networks in the SIMATIC S7 system family using the example of SIMATIC S7-1500
- PLC variable table and data types
- Program blocks and editor
- New programming possibilities with the SIMATIC S7-1500
- Troubleshooting on S7-1500 PLCs using TIA Portal tools
- Introduction to the HMI and visualization system SIMATIC WinCC Basics
- Migration of a SIMATIC STEP 7 V5.x project to SIMATIC TIA Portal
- Watchlists and force tables

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

TIA - SAFETY INTEGRATED

TARGET GROUP

Commissioning Personnel | Programmers | Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Participation in a QTE training:
- ‚TIA - Programming I Basic‘ and/or
- ‚TIA - Maintenance and Service I Advanced‘ or comparable qualifications

DESCRIPTION | IMPLEMENTATION

An insight is provided into the functionality, diagnostics, troubleshooting and programming of TIA-S7 Safety Integrated. This also includes the fail-safe central components of the S7-1200 and S7-1500 as well as the fail-safe decentralized ET200 systems.

The training content is discussed multimodally. Theoretical knowledge is deepened by creating typical application examples. There will be ample opportunity to apply this knowledge practically with an S7-1500 automation device and a simulation model.

CONTENT

- Standards and Guidelines- Overview
- Principle, system structure, and peripheral devices of Safety Integrated
- Programming a safety-related user program
- Designing fail-safe peripherals
- CPU diagnosis, peripheral diagnosis, advanced diagnostic tools
- Communication, troubleshooting of peripheral setup
- Exercises on peripheral setup
- Examples of programming (programming specifics, emergency stop, safety-related shutdown, deactivation)
- Identifying possible errors using a training model

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

TIA
SEQUENTIAL FUNCTION CHART PROGRAMMING

TARGET GROUP

Commissioning Personnel | Programmers | Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Participation in a QTE training:
- ‚TIA - Maintenance and Service I Basic‘ or comparable qualifications

DESCRIPTION | IMPLEMENTATION

This training provides knowledge on designing, programming, and commissioning sequence chains based on the TIA Portal.

The training content is discussed in a multimedia format. A balanced combination of theoretical tasks and practical exercises on models completes the course.

CONTENT

- Technological tasks and sequence chains
- Alternative and simultaneous branching
- Creating a sequence chain based on TIA Portal
- Programming chain blocks
- Programming step actions
- Programming transitions
- Programming monitoring and interlocks
- Event-driven actions
- Commissioning and test functions

COURSE DURATION
1 days

MINIMUM PARTICIPANTS
4 People

NETWORKS

Communication and Network Technology for Industry

Industrial communication and network technology is are essential for reliably controlling and monitoring machines and systems.

The demands on industrial networks are diverse and complex. Increasing data volumes and extensive communication require powerful and above all reliable components, which are capable of transporting information across all levels.

Whether in manufacturing or process industries, many manufacturers rely on PROFINET, an Industrial Ethernet Standard and OPC UA, the Open Platform Communications Data exchange standard.

Across the entire automation and drive portfolio, devices and systems communicate via PROFINET and OPC UA. PROFINET for speed and reliability. OPC UA for flexibility and data semantics. End-to-end digitization—from the field level to the control level and all the way to the cloud.

PROFINET WITH STEP7 V5.x

TARGET GROUP

Commissioning Personnel | Programmers | Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Basic knowledge of STEP 7

DESCRIPTION | IMPLEMENTATION

This training demonstrates how to quickly and effectively parameterize, commission, and troubleshoot PROFINET with SIMATIC components. The focus is on planning, installing and configuring the network to avoid errors during design and commissioning.

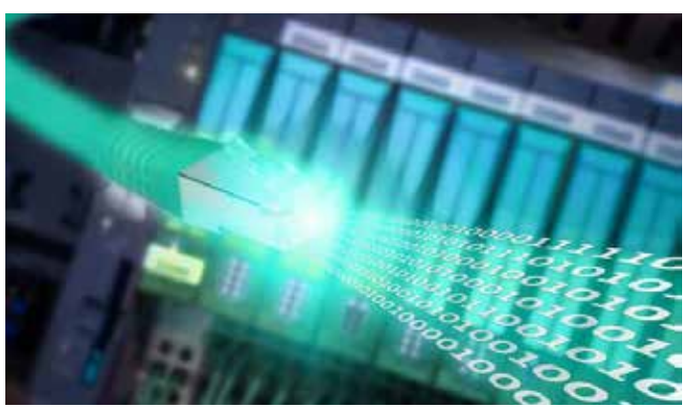
The training content is delivered in a multimedia format, and training models are available for practical exercises.

CONTENT

- Basics of PROFINET IO with configuration and programming, as well as basics of PROFINET RT & IRT
- Guidelines for setting up PROFINET IO networks
- Network components of PROFINET and network transitions
- Commissioning of the PROFINET IO network
- Diagnosis and fault localization in the PROFINET IO network
- Extensive practical examples with exercises

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People



PROFINET
IN THE TIA PORTAL

TARGET GROUP

Commissioning Personnel | Programmers | Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Participation in a QTE training:
- ‚TIA - Programming I Basic‘
- ‚TIA - Maintenance and Service I Basic‘ or comparable qualifications

DESCRIPTION | IMPLEMENTATION

This course is perfect for maintenance technicians who want to prepare themselves to work with cutting-edge technologies like IoT. The training provides comprehensive knowledge and is ideally complemented by the supplementary OPC-UA training.

The content is delivered in a multimedia format, and typical application examples deepen the theoretical knowledge. There will be ample opportunity to apply the new knowledge practically with automation devices from the S7-1500 series and to work on a simulation model.

CONTENT

- Basics of Ethernet and PROFINET, differentiation from Profibus
- PROFINET RT & IRT in TIA Portal with project configuration
- Guidelines for PROFINET IO setup
- Networks and network components
- Building and handling networks, what to consider
- Network transitions in PROFINET
- PN-PN coupling
- S7 communication
- Put/Get communication
- IDevice function
- TSEND / TRCV (Send/Receive)
- S7 Web Server
- Commissioning of the PROFINET IO network
- Diagnosis and fault localization in the PROFINET IO network
- Extensive practical examples with exercises round off the training and consolidate the acquired knowledge.

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

OUR TIP

This course is perfect for maintenance technicians who want to work with cutting-edge technologies like IoT. The training provides comprehensive knowledge and is ideally complemented by the supplementary OPC-UA training.

DATA EXCHANGE VIA OPC-UA WITH THE TIA PORTAL

TARGET GROUP

Maintenance Technicians | Commissioning Personnel | Advanced Service Personnel | Programmers | Project Engineers

REQUIREMENTS

- Participation in a QTE training:
  ‚TIA - Maintenance and Service I Basic‘
  ‚TIA - PROFINET in TIA Portal‘
  or comparable qualifications

DESCRIPTION | IMPLEMENTATION

This course provides the necessary basics for OPC-UA communication in systems using TIA Portal and Node-Red as examples. The required settings in the system are modified and the functionalities of the communication are worked out. Practical examples show, how variables for OPC-UA communication are prepared and integrated into the system program. Diagnostic options are demonstrated and deepened through exercises.

The training content is delivered in multimedia form and typical application examples enhance the theoretical knowledge. There will be ample opportunity to apply the newly acquired knowledge practically with automation devices from the S7-1500 series and to work on a simulation model.

CONTENT

- Setting up OPC in the PLC
- Exercises on a prepared project
- Providing variables for OPC UA
- Reading data from the PLC
- Writing data to the PLC
- Plausibility check
- Diagnosis with Debug Node and Traces
- Additional: Introduction to 1500 Web Server
- Additional: Installation of Node-Red on PG

COURSE DURATION
1 day

MINIMUM PARTICIPANTS
4 People

VISUALIZATION

Control and Monitor

The QTE Training courses in the field of visualization provide valuable support for maintenance personnel. In an era where complex information must be quickly and accurately processed, visualization enables the graphical representation of machine and system data.

These courses teach the skills necessary to effectively efficiently visualize technical information, significantly simplifying monitoring, analysis, and diagnostics.

The resulting faster fault detection, more efficient maintenance planning, and data-driven decision-making contribute to improved operational efficiency and system availability.

WINCC FLEXIBLE 2008

TARGET GROUP

Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Basic knowledge of Microsoft Windows
- Participation in a QTE Training: ‚S7 V5.x- Maintenance and Servicing | Basic‘

DESCRIPTION | IMPLEMENTATION

This training provides an overview of the various TPs and OPs from Siemens. It covers the basics of Step 7-based programming and project design for WinCC flexible-based visualization, all the way to a fully functional HMI.

The training content is presented in multimedia. Illustrative example programs and hands-on exercises deepen the theoretical knowledge. The Step7 Manager V5.x and WinCC flexible 2008 SP3 are used.

CONTENT

- Application possibilities of Siemens TPs and OPs
- Communication between PLC and TP
- System, bit, and analog messages
- Buttons and I/O fields
- Recipe processing
- Setting and adjusting communication parameters for HMI connections
- Project backup and restoration using Backup/Restore
- Dynamization of objects

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

WinCC
VISUALIZATION IN TIA PORTAL

TARGET GROUP

Commissioning Personnel | Programmers | Project Engineers | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Basic knowledge in the TIA Portal area
- Participation in a QTE Training:
  ‚TIA - Maintenance and Servicing | Advanced‘
  ‚TIA - Programming | Advanced‘

DESCRIPTION | IMPLEMENTATION

This training provides an insight into SIMATIC WinCC based on the TIA Portal. Participants will gain confidence in using the software interface and learn how to effectively integrate SIMATIC WinCC-Basic into everyday tasks.

The course is conducted using multimedia, with a balanced mix of theory and practical exercises to round off the training.

CONTENT

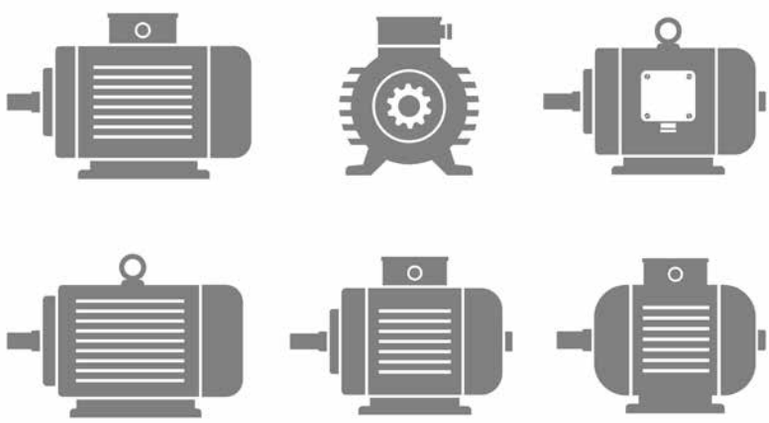
- Configuration of Siemens HMI Stations
- Communication between HMI stations and various PLC processors
- Basic instructions for the tool package, images, and variables
- Fault and process messages
- Input/Output fields
- HMI recipe processing
- HMI user management
- Setting and adjusting communication parameters
- Data backup through Backup/Restore
- Dynamic object management: bar and curve diagrams
- Practical exercises with a training model

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

DRIVE TECHNOLOGY

Efficient plant availability



Drive systems are crucial for the smooth operation of machines and equipment in many industrial processes. A solid understanding of drive technology enables maintenance personnel to grasp the functioning of these systems, quickly identify faults and disturbances, and initiate preventive maintenance and repair measures.

QTE Training‘s courses on drive technology not only provide basic knowledge but also offer comprehensive insights into various motor and starting methods. The targeted learning of the appropriate starting method for different applications enhances the efficiency and performance of the systems. Additionally, the acquired knowledge allows maintenance personnel to efficiently replace drive components and ensure that the equipment operates optimally.

A comprehensive understanding of drive technology thus significantly contributes to increasing plant availability, preventing unplanned downtime, and improving the overall efficiency of production processes.

DRIVE TECHNOLOGY BASICS

TARGET GROUP

Maintenance Technicians | Service Technicians | Project Engineers

REQUIREMENTS

- Basic knowledge in the field of electrical engineering

DESCRIPTION | IMPLEMENTATION

This training provides fundamental knowledge on the selection and handling of drive components, as well as the integration of various drives.

The content is presented multimodally, with a balanced combination of theoretical tasks and practical exercises on models to complement the course.

CONTENT

- Differences in drive systems, three-phase, servo, and DC motors
- Correct selection of various drive systems
- Selection of the appropriate power electronics
- Selection and calculation of upstream and downstream fuses, circuit breakers, and motor protectors
- Advantages and disadvantages of group drives
- Integration of power electronics into control systems
- Connection via bus systems, cables, analog signals, and digital signals
- Feedback of actual signals to power electronics and PLC
- Setting torque, currents, and ramps
- Controls and control programs for positioning drives
- Safe shutdown of drives

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

COMMISSIONING, PARAMETERISATION AND COMMUNICATION WITH INVERTERS

TARGET GROUP

Commissioning Personnel | Maintenance Technicians | Service Technicians

REQUIREMENTS

- Basic knowledge of drive technology and automation technology

DESCRIPTION | IMPLEMENTATION

This training covers the commissioning and parameterization of inverters and drive systems, as well as setting up communication via Profibus or Profinet. The key functions and settings are explained step by step, enabling participants to learn the correct commissioning and parameterization of the inverter, including data exchange with a higher-level controller, for safe and reliable operation of the system.

A Siemens Micromaster with a drive is available for practical exercises.

The course offers a balanced mix of theoretical tasks and practical exercises using models.

CONTENT

- Structure and operation of the inverter
- Setting up communication via PROFIBUS/PROFI-NET
- (De-)parameterization of important functions
- Commissioning the inverter
- Transferring setpoints and actual values
- Adjusting and modifying control functions
- Diagnosis and troubleshooting of the inverter

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

SIMOTION SCOUT FOR MAINTENANCE ENGINEERS

TARGET GROUP

Maintenance Technicians | Service Technicians

REQUIREMENTS

- Basics of Drive Technology and Automation Technology with Step7 Manager V5.x

DESCRIPTION | IMPLEMENTATION

This QTE Training course provides knowledge on the commissioning of a servo drive using the Scout v4.5 software. Topics covered include troubleshooting, software upload/download, getting familiar with control panels, commissioning a drive, and axis movement.

The content is presented multimedia-style, with a balanced mix of theoretical tasks and practical exercises on models.

For practical exercises, a SIMOTION D410 Integrated with PM240 and a Siemens servo with encoder and Drive Cliq connection are provided.

CONTENT

- Basics of drive technology & control technology
- Hardware: Simotion components, series, firmware versions, memory cards, licenses
- Hardware configuration: SIMOTION embedded in Step7, stand-alone HW configuration in Scout
- Hardware peripherals: Motor, encoder, and DRIVE-CLiQ interfaces
- Software: Differences and basics of Starter, Scout
- Motor, encoder, and DRIVE-CLiQ interfaces
- Error detection and diagnostics
- Signal analysis and trace recordings
- Using control panels for commissioning
- Managing program versions between PG and target device, RAM to ROM

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

SINAMICS G120 IN THE TIA PORTAL

TARGET GROUP

Maintenance personnel | Service technicians

REQUIREMENTS

- Basic knowledge in the TIA Portal area
- Participation in a QTE training:
- ‚TIA – Maintenance and Service | Basic‘ or equivalent qualifications

DESCRIPTION | IMPLEMENTATION

This course covers the integration of a G120 frequency converter into the TIA Portal. It explains the use of technology objects and control panels, as well as the parameterization of the frequency converter through the commissioning assistant.

The course provides an overview of the necessary steps and functionalities when using frequency converters in the TIA Portal.

The training content is presented multimodally. Using the practice devices, participants have the opportunity to apply and understand the theoretical content practically.

CONTENT

- Getting familiar with the hardware component S7 – G120
- Integration of the G120 into the hardware of the TIA Portal
- Commissioning Assistant
- Technology objects and control panel
- Calling and parameterizing MC blocks
- Diagnostic options

COURSE DURATION
1 day

MINIMUM PARTICIPANTS
4 People

BECKHOFF

Product training

With the Beckhoff TwinCAT system, almost any compatible Windows PC can be used for real-time control of machines and systems. This enables a flexible and powerful control solution that can be seamlessly integrated into the existing IT infrastructure.

In the TwinCAT environment, various control programs and development environments are available, which assist in programming, diagnostics, and configuration. These tools provide extensive possibilities for customization, troubleshooting, and system optimization.

TWINCAT 2
MAINTENANCE AND SERVICING

BASIC

TARGET GROUP

Maintenance personnel | Service technicians

REQUIREMENTS

- Fundamental knowledge in digital technology and Microsoft Windows
- Knowledge of other PLC programming languages is an advantage.

DESCRIPTION | IMPLEMENTATION

This training provides comprehensive knowledge in using the TwinCAT software, both for programming and hardware configuration. The goal is to impart a solid foundation for managing existing systems with Beckhoff TwinCAT and to facilitate troubleshooting through common PLC programming functions.

The training content is presented in multimedia format. Typical application examples and simple programming exercises deepen the theoretical knowledge. Practical examples and exercises with a model complement the training, enabling the hands-on application of the newly acquired skills with Beckhoff TwinCAT 2.

CONTENT

- Working with Beckhoff TwinCAT 2 Software
- Basics of the IEC 61131-3 programming standard
- Creating, expanding, and linking input and output variables
- Working with the System Manager
- Fundamentals of programming with PLC-Control
- Program expansion and program analysis
- Saving and downloading source code to the PLC
- Comparing programs
- Integrating libraries
- Basics of integrated visualization
- Creating boot projects

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

TWINCAT 2
MAINTENANCE AND SERVICING

ADVANCED

TARGET GROUP

Maintenance personnel | Service technicians

REQUIREMENTS

- Advanced knowledge of TwinCAT 2
- Participation in a QTE training:
  'TwinCAT 2- Maintenance and Service | Basic'

DESCRIPTION | IMPLEMENTATION

This training provides in-depth insights into function blocks, system-related functions, and more advanced programming techniques for systems automated with Beckhoff TwinCAT 2.

The training content is delivered multimedia-style. Application examples and programming exercises complement the theoretical knowledge. Practical examples round off the topics, offering plenty of opportunities to apply the newly acquired knowledge on a PLC CX9020 with TwinCAT 2.11 in a practical environment.

CONTENT

- Simulation on Laptop (Target System = Local Machine)
- Evaluate status word of complex terminals
- Integrating additional libraries into TwinCAT 2
- Attaching actions to function blocks
- Structured Text Editor: Loops, loop exit with Exit, arrays
- Flags & memory overlapping access
- Write persistent data to ROM (SD card)
- TcUtilities.lib (e.g., reading CPU load and latency time)
- Error codes, ADS return codes
- Introduction to SFC / AS (Steps & Transitions, time monitoring)

COURSE
DURATION
3 days

MINIMUM
PARTICIPANTS
4 People

TWINCAT 2 TO TWINCAT 3 CHANGEOVER

TARGET GROUP

Maintenance personnel | Service technicians

REQUIREMENTS

- Fundamental knowledge in Beckhoff TwinCAT 2
- PC and Microsoft Windows knowledge is required.

DESCRIPTION | IMPLEMENTATION

This course covers the differences between Beckhoff TwinCAT 2 and Beckhoff eXtended Automation (XAE), as well as the project planning and programming capabilities of the Beckhoff TwinCAT 3 engineering platform.

The training content is presented in multimedia format. Practical examples complement the topics discussed. Participants will have ample opportunity to apply their newly acquired knowledge using exercise models.

CONTENT

- Beckhoff eXtended Automation Engineering (XAE) Engineering Tool and Device Runtime (XAR)
- Introduction to the TwinCAT 3 system
- Device configuration
- Program blocks and editors
- Memory areas, reference lists, observation lists
- License management, generating test license
- Going online, writing/forcing values
- Programming FBs, FCs in FUP and ST
- Insight into ScopeView
- Diagnostic options and troubleshooting in TwinCAT 3
- Fundamentals of integrated visualization
- Comparing program states

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

TWINCAT 3
MAINTENANCE AND SERVICING

BASIC

TARGET GROUP

Maintenance personnel | Service technicians

REQUIREMENTS

- Basic knowledge in digital technology and Microsoft Windows
- Knowledge of Beckhoff TwinCAT 2 is advantageous

DESCRIPTION | IMPLEMENTATION

This training teaches the safe handling of TwinCAT software for programming and hardware configuration to maintain existing systems with Beckhoff TwinCAT. You will gain solid foundational knowledge to efficiently troubleshoot using common PLC programming functions.

The training content is presented in multimedia format. Typical application examples and simple programming exercises deepen theoretical knowledge. Practical examples and model exercises complement the topics discussed, offering ample opportunity to apply the newly acquired knowledge with Beckhoff TwinCAT 3 in a hands-on manner.

CONTENT

- Introduction to Beckhoff eXtended Automation Engineering (XAE)
- Overview and structure of hardware components
- Programming in FUP (Function Block Diagram) and ST (Structured Text)
- Creating a PLC program
- Creating global variables
- Variable data types, data types (DUT)
- Program, function, function block
- Introduction to programming according to IEC 61131-3
- Exercises, diagnosis, troubleshooting
- Creating boot projects
- Using TwinCAT 3 Scopeview as a PLC analyzer
- Comparing programs
- Integrating libraries in TwinCAT 3
- Fundamentals of integrated visualization in TwinCAT 3

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

TWINCAT 3
MAINTENANCE AND SERVICING

ADVANCED

TARGET GROUP

Maintenance personnel | Service technicians

REQUIREMENTS

- Knowledge of TwinCAT 3 or
- Participation in a QTE training: ‘TwinCAT 3 Maintenance and Service | Basic’ or equivalent qualifications

DESCRIPTION | IMPLEMENTATION

The goal of this training is to refresh the knowledge acquired in the basic TwinCAT3 course, provide advanced expertise in troubleshooting and fault detection, and consolidate and deepen the existing knowledge.

The training content is delivered in multimedia format. The theoretical knowledge is reinforced with common application examples, which are practically applied using a simulation model to deepen understanding.

CONTENT

- Refresher on troubleshooting knowledge in TwinCAT 3
- Typical types of faults
- Identifying errors in hardware and programming
- Guidelines for a systematic approach to efficient troubleshooting
- Familiarization with diagnostic tools for fault detection
- Detecting and correcting malfunctions using a practice model
- Applying diagnostic functions in TC3
- Accessing additional EtherCAT participants

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

TWINCAT 3
DRIVE TECHNOLOGY

TARGET GROUP

Maintenance personnel | Service technicians

REQUIREMENTS

- Basic knowledge of TWINCAT 3
- Participation in a QTE training:
  ‚TwinCAT 3- Maintenance and Service‘ or
  ‚Switching from TwinCAT 2 to TwinCAT 3‘

DESCRIPTION | IMPLEMENTATION

This course provides fundamental knowledge on basic point-to-point movements, starting with the insertion of an axis object up to positioning.

The training content is presented multimedia-based. The theory is deepened through practical applications on a control system with a Beckhoff servo drive and a stepper drive.

CONTENT

- Point-to-Point Positioning
- Create Motion NC-Task
- Integrate Motion Library TC2-MC2
- Build axis block in PLC-Control
- Link axis object between drive terminal and PLC
- Basic drive parameters
- Online commissioning panel
- Zero axis position
- Calculate increments to position
- Beckhoff DriveManager

COURSE DURATION
1 day

MINIMUM PARTICIPANTS
4 People

OUR TIP

This training can be booked as an addition to the course **TWINCAT 3 Maintenance and Service.**

HYDRAULICS

EXERCISES ON THE MODEL

We provide many practical exercises on the fundamental principles of oil hydraulics, the function of control and drive components, and their application.

QUICKLY IDENTIFY FAULTS

The transition from control to implementation often carries significant potential for faults. One of the key goals of our training is to address these complex topics in a practical manner. This enables participants to quickly analyze and learn how to resolve faults on their own.

UNDERSTAND CIRCUIT DIAGRAMS

Reading circuit diagrams and analyzing faults are also part of our diverse hydraulic training offerings.

In many industrial applications, what is initiated in the control system is hydraulically implemented in the plant. Hydraulic systems are used in both mobile and stationary applications in modern production and manufacturing facilities. They are particularly important for motion tasks that require high forces. Due to their specific advantages, such as high power density, precise positioning accuracy, and good controllability, hydraulic drives are essential in machine and plant construction as well as in vehicle and aircraft construction.

The focus of these trainings is not only on technical maintenance but also on supporting programmers and PLC maintenance personnel.

OUR HYDRAULIC SYSTEM

In our training sessions, we use a mobile hydraulic system with a pressure of 120 bar / 1700 psi.

Thanks to its steerable wheels, we can deploy it in almost any training room. It is provided for training in hydraulics and for simulating faults.

We play it safe. The hydraulic system is not opened, ensuring no oil leakage, no spilling.

All hose lines are regularly replaced before their expiration date and are protected by burst protection hoses.

Should a drop escape, the system is protected by a catch basin. All leaks are contained.

The reconnection of individual hose lines during selected exercises is done with leak-free flat-face couplings.

Vulnerable hose lines are equipped with pull-out protection.

FACTS ABOUT OUR HYDRAULIC SYSTEM:

- Length: approximately 190 cm
- Height: approximately 180 cm
- Depth: approximately 75 cm
- Weight: approximately 450 kg

REQUIREMENTS FOR INHOUSE TRAINING:

- 400 V and 230 V connection
- Wheelchair accessible
- Level surface. If necessary: Elevator to be provided

HYDRAULIC HOSE LINE

TARGET GROUP

Maintenance Technicians | Service Technicians | Fitters | Designers | Engineers | Hydraulic Service Providers | Occupational Safety Specialists

REQUIREMENTS

- Activity in the relevant field
- Technical training or equivalent qualification

DESCRIPTION | IMPLEMENTATION

Hydraulic hose lines are a critical component in hydraulic systems, yet they often receive little attention. This training aims to raise awareness about the handling of hydraulic hose lines. Proper handling can significantly reduce faults and costs in hydraulic systems and machinery.

The training content is delivered using multimedia and illustrated with practical examples from everyday life.

CONTENT

- Structure and function of hydraulic hose lines
- Manufacturing and assembly
- Identification
- Design
- Basic knowledge and function of hydraulic systems
- Damage – hose rupture, pinholes, external/internal damage
- Hose line protection
- Fault prevention
- Dangers and safety at work when handling hydraulic hose lines
- DGUV Regulation 113-020
- Testing activities

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

HYDRAULICS FOR MAINTENANCE STAFF MAINTENANCE AND SERVICING

BASIC

TARGET GROUP

Employees without technical or hydraulic basic training | Career changers from other professions | Occupational safety specialists

REQUIREMENTS

- Basic Technical Understanding

DESCRIPTION | IMPLEMENTATION

In addition to technically trained employees, there are also those who do not have technical training or have not been working in the technical field for a longer period.

For this target group, we offer a course that covers the basics of hydraulics and its components.

While hydraulics is often addressed in technical professions, it is frequently only treated superficially, meaning the full potential of hydraulics is not fully understood.

By using training systems, the theoretical content is practically demonstrated, enabling individuals without prior hydraulic knowledge to develop a better understanding of this field.

CONTENT

- What is Hydraulics
- What is Hydraulics Used For
- Pros and Cons of Hydraulics
- Where is Hydraulics Used
- What to Consider in Hydraulics
- Components of a Hydraulic System
- Safety Aspects in Hydraulics

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

HYDRAULICS FOR MAINTENANCE STAFF MAINTENANCE AND SERVICING

ADVANCED

TARGET GROUP

Maintenance Technicians | Service Technicians | Fitters | Designers | Engineers | HY Service Providers

REQUIREMENTS

- Technical training

DESCRIPTION | IMPLEMENTATION

Hydraulics is covered in the training of many technical professions, but often only superficially, meaning the full potential of this technology is only partially understood.

This course provides a comprehensive understanding of the operation of hydraulic systems, starting from the basic concepts and components to advanced expert knowledge. It is primarily aimed at maintenance staff with existing technical background knowledge. The use of training systems makes the theory tangible and practical.

CONTENT

- Hydraulics in Detail
- Technical Advantages and Disadvantages of Hydraulics
- Physics of Hydraulics
- Force/Pressure and Speed
- Hydraulic Pumps
- Pressure Relief Valves
- Fittings, Pipes, Hoses
- Directional Valves
- Other Valves
- Hydraulic Cylinders
- Pressure Fluids, Tanks, Filters
- Circuit Symbols according to DIN ISO 1219 and DIN ISO 1219-1
- Malfunctions in Hydraulic Systems

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

HYDRAULICS FOR MAINTENANCE STAFF MAINTENANCE AND SERVICING

EXPERT

TARGET GROUP

Maintenance technicians | Service technicians | Fitters | Designers | Engineers | Hydraulic service providers

REQUIREMENTS

- Technical training
- Participation in a QTE training: ‚Hydraulics for Maintenance and Servicing I Advanced‘

DESCRIPTION | IMPLEMENTATION

The goal of this training is to identify errors and problems in hydraulic systems more quickly and solve them more effectively. By gaining in-depth knowledge of hydraulic systems and their components, the design and maintenance are optimized, leading to more efficient and faster solutions.

The training will practically explain and analyze the components, their functions, and possible faults on training systems.

CONTENT

- Refreshing and expanding prior knowledge
- Advanced knowledge of components: valves, cylinders, pumps, accumulators
- Proportional valves
- Variable displacement pumps
- Valve blocks
- Fault and failure analysis
- Potential sources of error
- Reading and creating hydraulic circuit diagrams
- Symbols according to DIN ISO 1219 and DIN ISO 1219-1
- Preventive maintenance

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

HYDRAULICS FOR MAINTENANCE STAFF CARTRIDGE VALVES / LOGIC VALVES

TARGET GROUP

Maintenance Technicians | Service Technicians | Fitters | Designers | Engineers | HY Service Providers

REQUIREMENTS

- Participation in a QTE training:
  ‚Hydraulics for Maintenance and Servicing I Advanced‘
  ‚Hydraulics for Maintenance Maintenance and Servicing I Expert‘

DESCRIPTION | IMPLEMENTATION

Cartridge valves, also known as logic valves, represent a special category of valves in hydraulics. They are characterized by their unique design, actuation, translation, and volume, making them distinct from other valves.

This course will provide a detailed explanation of the various features of cartridge valves, comparing them in context. Special focus will be given to the respective advantages and disadvantages of these valves.

CONTENT

- 2-way cartridge valves in seat construction / Overview of Cartridge Valves
- Properties and areas of application
- Fundamental physics: force, pressure, flow, translation
- Advantages and disadvantages
- Differences to slide valves
- Types of circuits and their peculiarities
- Functions of control caps for 2-way cartridge valves, pilot control
- Area ratios and nozzles
- Basic circuits with 2-way cartridge valves
- Circuit symbols and diagrams

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

FAILURE ANALYSIS IN HYDRAULIC SYSTEMS

TARGET GROUP

Maintenance Technicians | Service Technicians | Fitters | Designers | Engineers | Hydraulics Service Providers | Occupational Safety Specialists

REQUIREMENTS

- Technical training or
- Participation in a QTE training: ‚Hydraulics for Maintenance and Servicing I Advanced or Expert‘

DESCRIPTION | IMPLEMENTATION

Training and professional experience in hydraulics often offer great potential for expansion. Especially in the areas of fault analysis and diagnosis, as well as the development of solutions, targeted guidance is of great importance.

In this course, participants will learn to systematically analyze faults and issues. By utilizing measurements, circuit diagrams, and real machines, a deep understanding of fault diagnosis is provided.

On training systems, faults are intentionally simulated, analyzed, and solutions are systematically developed to provide practical knowledge and deepen skills.

CONTENT

- Methodical analysis of faults and disturbances
- Fault sources in components-, mechanical, hydraulic, and electronic
- Measurements in hydraulic systems
- Use of measuring instruments, probes, switches, etc. in fault analysis
- Analysis and interpretation of measurement data
- Matching faults with circuit diagrams
- Practical and logical troubleshooting
- Development of analyses and solutions for real faults in participants‘ operations

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

OUR TIP

The training can gladly be conducted as an **Inhouse** session directly on-site.

PNEUMATICS

Practical Pneumatic Courses at the Highest Level

Pneumatics is used in a wide range of machines and is of great importance in many industries. It plays a crucial role in controlling and operating systems, particularly due to its advantages in terms of high speeds and rotational frequencies.

However, leaks and improper use can lead to high energy costs. Therefore, efficient and proper handling of pneumatics is essential for maintenance.

QTE Training provides support in the area of pneumatics, especially in handling and troubleshooting, through in-depth knowledge.

The training uses training rigs from FESTO Didactic to provide practical experience and effectively apply the theory.

PNEUMATICS PNEUMATICS FOR MAINTENANCE STAFF

BASIC

TARGET GROUP

Maintenance Technicians | Service Technicians | Installers | Designers | Engineers | Occupational Safety Experts

REQUIREMENTS

- Technical training

DESCRIPTION | IMPLEMENTATION

In many technical professions, pneumatics is part of the training. However, important details that can impact productivity and efficiency are often overlooked in day-to-day operations.

This course provides comprehensive knowledge about the operation of pneumatic systems, starting with the fundamentals of pneumatics and its components and progressing to expert-level insights.

CONTENT

- Function and Application of Pneumatics
- Physical quantities and units in pneumatics
- Properties of the medium air
- Advantages and disadvantages of pneumatics
- Compressed air generation, drying, distribution, and energy conversion
- Treatment units
- Actuators (cylinders, rotary drives, etc.)
- Valve technology (directional control valves)
- Flow control valves
- Selection criteria for supply and exhaust throttling
- Switching valves, double-pressure valves, pneumatic AND/OR logic
- Time or delay valves, sequence valves
- Circuit symbols according to DIN ISO 1219
- Troubleshooting

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

PNEUMATICS PNEUMATICS FOR MAINTENANCE STAFF

ADVANCED

TARGET GROUP

Maintenance Technicians | Service Technicians | Fitters | Designers | Engineers | Occupational Safety Specialists

REQUIREMENTS

- Technical Training
- Participation in a QTE Training: ‚PNEUMATICS for Maintenance Technicians I Basic‘

DESCRIPTION | IMPLEMENTATION

In many technical professions, pneumatics is part of the training. However, important details are often overlooked in everyday practice, which can affect productivity and efficiency.

This course provides a comprehensive introduction to the functioning of pneumatic systems and their components, progressing to in-depth expert knowledge.

CONTENT

- Brief refresher of knowledge from the BASIC course
- Circuit technology in theory and practice
- Circuit diagrams and symbols according to DIN ISO 1219
- Time-dependent control
- Path-dependent control
- Signal shutdown
- Step chain
- Construction of practice control systems
- Fault analysis and troubleshooting

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

ELECTROPNEUMATICS FOR MAINTENANCE

TARGET GROUP

Maintenance technicians | Service technicians | Fitters | Designers | Engineers | Occupational safety specialists

REQUIREMENTS

- Technical training

DESCRIPTION | IMPLEMENTATION

In many technical professions, pneumatics is part of the training; however, electro-pneumatics is often given less attention due to the advancement of electronic components and the increasing complexity of systems.

This course covers the operation of electro-pneumatic systems and their components, starting from the fundamentals of pneumatics to electronics, controls and sensors.

CONTENT

- What is Electro-Pneumatics?
- Physical fundamentals of pneumatics
- Basics of electrical engineering in pneumatics
- Electro-pneumatic control technology
- Examples: circuits and troubleshooting
- PLC basics
- Circuits
- Switching symbols and circuit diagrams according to DIN ISO 1219
- Faults in electro-pneumatic systems

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

IMPORTANT NOTICE

The seminar is specifically shaped for participants **without** an electrical engi¬neering background.

CROSS PRODUCT TRAININGS

Manufacturer-independent fault resolution and efficient troubleshooting

In machines and systems, often components from various manufacturers are integrated. It is crucial to quickly and accurately identify and resolve sources of malfunctions, which may occur in the interaction between these components.

QTE Training offers comprehensive support in methodical troubleshooting, which can be applied regardless of the specific products. This enables a cost-effective working approach and helps to minimize downtime.

CHANGEOVER FROM STEP7 TO TWINCAT 2 I 3

TARGET GROUP

Maintenance technicians | Service technicians

REQUIREMENTS

- Solid foundational knowledge of Step7 SIMATIC Manager
- TIA Portal, as well as PC and Microsoft Windows skills, are mandatory

DESCRIPTION | IMPLEMENTATION

The differences and similarities between the two programming environments are analyzed by comparing them and preparing typical approaches from Step7 for TwinCAT under IEC 61131-3.

The training content is delivered through multimedia and deepened with practical examples. Additionally, participants have the opportunity to apply the newly acquired knowledge practically using the Beckhoff Embedded PC CX-9020 and a simulation model.

CONTENT

- Standard IEC 61131-3
- HW configuration and EA <> Device, mapping, process data object
- OB1 <> Main program
- Variable declaration, addressing according to IEC 61131-3
- Siemens counters, timers, edge detectors, and corresponding IEC function blocks
- Concept (Global) DB <> Global variable list
- Concept instance DB <> Instances according to IEC 61131-3
- Interrupt OB35 / cycle time <> Second program, task, task priority
- VISU / HMI > HMI variable table <> Direct access to VAR in PLC

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

METHODICAL TROUBLESHOOTING FOR MAINTENANCE STAFF

TARGET GROUP

Maintenance technicians | Employees in electrical/ mechanical maintenance | Engineers | Service technicians

REQUIREMENTS

- Technical training
- Experience in handling complex machines

DESCRIPTION | IMPLEMENTATION

This training provides in-depth knowledge to recognize potential sources of errors in maintenance and minimize possible plant downtime.

Participants will gain practical experience with diagnostic tools and learn how to systematically evaluate faults using checklists and other aids. This enables the targeted identification and resolution of weaknesses.

By fostering these skills, maintenance technicians are made more aware of cost-effective thinking and actions, leading to a sustainable increase in operational efficiency.

CONTENT

- Typical causes of malfunctions in machines and systems
- Importance of systematic fault analysis
- Introduction to structured troubleshooting
- Fundamentals of fault diagnosis – use of diagnostic tools
- Diagnostic techniques: vibration analysis, thermography, ultrasound testing
- Fault analysis and data interpretation – collecting, interpreting, and evaluating data
- Practical examples and application exercises
- Proper use of checklists and other aids
- Predictive maintenance and preventive maintenance strategies

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

FAULT ANALYSIS IN COMPLEX PRODUCTION SYSTEMS

TARGET GROUP

Maintenance technicians | Users | Service technicians | Installers | Designers | Engineers | Hydraulic service providers

REQUIREMENTS

- Technical training
- Experience in handling complex machines

DESCRIPTION | IMPLEMENTATION

Complex systems require equally complex diagnostics. This course demonstrates how cross-system malfunctions can be effectively detected, regardless of the type of energy involved.

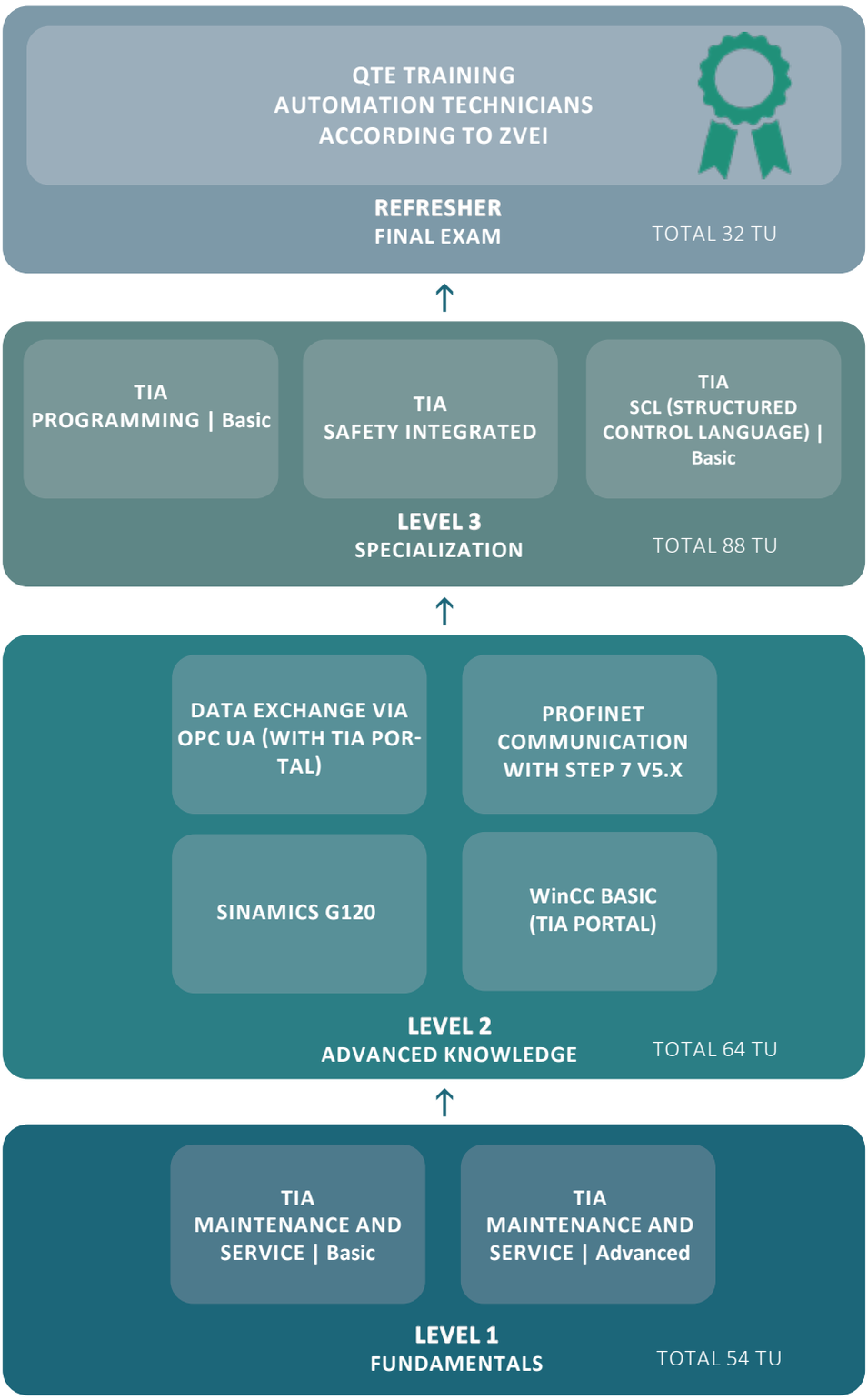
The course begins with the control technology (PLC) of the system and extends to hydraulic, pneumatic, and mechanical components and assemblies. Together, structured analysis methods are developed and applied in a practical, hands-on model to deepen understanding.

CONTENT

- Clarification of the term ‘diagnosis’ and basic structuring of the problem situation into the various technology areas
- Basic information about the involved technologies: pneumatics, hydraulics, electrical systems, PLC, and bus systems
- Fundamentals of using measurement technology for analysis, interdisciplinary
- Development of an analysis structure with the corresponding questioning techniques
- Structured, practical analysis on specially modified training systems
- Handling of emerging technical questions and addressing maintenance issues from production

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People



The training to become a PLC Automation Technician follows the guidelines of ZVEI and VDMA in four learning stages. These four stages lead to qualification as an PLC Automation Technician with a focus on project planning and service.

This training offers an exciting and forward-looking opportunity to specialize in a diverse and growing field of industry. Automation technicians are experts in the planning, development, installation, maintenance, and optimization of automated systems and plants. These systems include production facilities, manufacturing lines, as well as building automation solutions and applying robotics.

QTE TRAINING
AUTOMATION TECHNICIANS

ACCORDING TO ZVEI | REFRESHER AND FINAL EXAM

TARGET GROUP

Maintenance technicians, who wish to qualify for an expanded or new area of responsibility.

DESCRIPTION | IMPLEMENTATION

The mentioned courses cover all the necessary modules that an automation technician must master according to ZVEI. Upon completion of all courses, there is the possibility to obtain a certificate as an automation technician according to ZVEI.

This requires a final exam with theoretical questions and practical tasks. To ensure that all exam-relevant content has been understood, an intensive review of all modules is conducted in this course. On the final day, the actual exam takes place, followed by evaluation and certificate issuance.

REQUIREMENTS

Participation in the following QTE training sessions is required:

LEVEL 1 (FUNDAMENTALS) 54 Teaching units
- TIA- Maintenance and Service | Basic
- TIA- Maintenance and Service | Advanced

LEVEL 2 (ADVANCED KNOWLEDGE) 64 Teaching units
- Data exchange via OPC-UA (with TIA Portal)
- PROFINET- Communication with Step 7 V5.x
- TIA- Programming Basic
- SINAMIC G120 in TIA Portal
- WinCC Basic

LEVEL 3 (SPEZIALISIERUNG) 88 Teaching units
- TIA- Programming | Basic
- TIA- Safety Integrated
- TIA- SCL (Structured Control Language) | Basic

COURSE DURATION
4 days

MINIMUM PARTICIPANTS
4 People

SUCCESS METHODOLOGY OEE

BASIC

TARGET GROUP

Maintenance Technician | Maintenance Manager | Production Manager | Production Supervisor

REQUIREMENTS

- Responsible or jointly responsible for the performance of machines and systems in an automated production environment

DESCRIPTION | IMPLEMENTATION

Systems whose processes are controlled by OEE and continuous improvement projects (CIP) are increasingly common. This training teaches how the actual performance of a machine can be determined using simple methods.

Hidden performance potentials are made visible. The process of setting up OEE measurement and analyzing the data is demonstrated.

Modern techniques for trend detection to avoid future downtime are developed through practical examples.

After this training, OEE values and analyses can be interpreted in such a way that the plant's productivity can be actively and profitably increased.

CONTENT

- Basics of OEE
- Definition of Availability
- Definition of Speed
- Definition of Quality
- Calculation Examples
- DEMO-OEE Project
- Potential Analysis Using the OEE Methodology
- ROI Calculations Based on OEE
- Manually Determine or Verify Actual OEE (Without Digitization)
- Understanding and Optimally Implementing OEE Values

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

SUCCESS METHODOLOGY OEE

ADVANCED

TARGET GROUP

Maintenance Technician | Maintenance Manager | Production Manager | Production Supervisor

REQUIREMENTS

- Responsible or jointly responsible for the performance of machines and systems within an automated production environment
- Participation in a QTE Training: ‚Success Methodology OEE I Basic‘

DESCRIPTION | IMPLEMENTATION

Systems whose processes are increasingly controlled by OEE and continuous improvement projects (CIP) present employees with more frequent challenges.

This course teaches how the CIP process can be managed using OEE software and simple financial analysis. Practical examples demonstrate how OEE measurement can be implemented in complex production systems to generate meaningful and realistic values.

Upon completion of the training, participants will be able to interpret OEE values and analyses even in complex production processes, actively and profitably improving the plant’s production.

CONTENT

- Manual determination or verification of actual OEE (without digitization)
- Prerequisites for OEE software
- Introduction of OEE software
- Introduction of OEE in the company
- Preparations and prerequisites for an OEE pilot project
- Introduction of financial analysis with OEE support
- Comprehensive potential analysis using the OEE methodology
- Detailed ROI calculations based on OEE

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

OUR TIP

Take advantage of the opportunity and save costs by booking **BASIC and ADVANCED courses** together.

COMMUNICATION TOOLBOX FOR MAINTENANCE STAFF

TARGET GROUP

Managers | Maintenance Employees

REQUIREMENTS

- none

DESCRIPTION | IMPLEMENTATION

In the company, in addition to machine availability, effective communication is crucial for smooth maintenance operations. Especially when dealing with issues such as interface errors, e.g. between electrical and mechanical maintenance or machine breakdowns, clear and respectful communication is important. Handling conflicts should be constructive to minimize friction losses and free up more time for core business activities.

Our training provides practical know-how in communication and conflict resolution through interactive learning impulses, group work, and self-reflection.

The practical toolbox for successful communication.

CONTENT

Reporting Window COMMUNICATION
- Importance of communication for maintenance
- Role of the maintenance technician
- Do‘s and Don‘ts of communication
- Checklist for personal communication
- Effective meetings / team communication
- Data type: „I“ messages
- Function of active listening
- Structuring conversations
- Use of tools for communication

Troubleshooting / Issue Resolution COMMUNICATION DISTURBANCE
- Preventing errors through clear communication
- Conflict detection and resolution
- Reducing the risk of conflict escalation
- Constructive handling of conflicts
- Checklist for personal conflict style
- Goal: SOLUTION-ORIENTATION
- Tools for effective teamwork

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

BZTB zertifizierter Business Trainer

TRAINING ACCORDING TO DGUV

Training for Safety and Compliance

The majority of workplace accidents result from human error. To minimize the risk of accidents at work, the Occupational Health and Safety Act (ArbSchG) requires employers to provide comprehensive training to their employees on safety and health protection.

Occupational safety training is particularly necessary for new tasks, changes in responsibilities, accidents, or the introduction of new tools and technologies.

QTE Training‘s digital online training solution offers up-to-date, verifiable training on occupational safety.

QUALIFIED ELECTRICIAN FOR SPECIFIED TASKS I DGUV REGULATION 3

TARGET GROUP

Maintenance Technicians | Service Technicians | Fitters | Designers | Engineers | HY Service Providers | Safety Specialists | Sales Representatives

REQUIREMENTS

- Activity in the field of expertise
- Technical Training
- General Technical Understanding

DESCRIPTION | IMPLEMENTATION

In trades and industry, there are regular tasks that must only be performed by qualified electrical personnel or under their supervision, as required by regulations.

This course provides the necessary electrical knowledge to qualify as an electrical specialist for specific tasks according to DGUV Regulation 3. Subsequently, professional instruction in the respective area of activity by an electrical specialist within the company is required.

CONTENT

MODULE 1 (THEORY) 40 Teaching units

- Theoretical fundamentals of electrical engineering
- Hazards and effects of electrical current
- Protective measures and accident prevention
- Electrical operating equipment
- Use and connection of electrical devices

MODULE 2 (PRACTICE) 40 Teaching units

- Handling of measuring instruments and conducting measurement exercises
- Reading circuit diagrams and setting up circuits with contacts
- Three-phase technology
- Commissioning of electrical devices
- Performance check and certification

COURSE DURATION
2 x 5 days

MINIMUM PARTICIPANTS
4 People

IMPORTANT NOTE

The course duration is 80 teaching units. In two different modules, we teach the content of DGUV Regulation 3 in both a theoretical and a practical part.

ANNUAL TRAINING FOR ELECTRICIANS

ACCORDING TO DGUV (BLGV), TRBS, DIN EN 50110 AND THE OCCUPATIONAL SAFETY ORDINANCE FOR ELECTRICAL SPECIALISTS (EFK)

TARGET GROUP

Electrical Specialists | Electrical Specialists with Specialized Knowledge | Work Supervisors | Plant Managers

REQUIREMENTS

- Basic Electrical Knowledge

DESCRIPTION | IMPLEMENTATION

The annual electrical training for qualified electricians is a legal obligation for employers according to DGUV Regulation 1. The Occupational Health and Safety Act, the Ordinance on Industrial Safety with TRBS, DGUV Regulation 3 (formerly BGV A3), as well as DIN EN 50110-1, require recurring electrical training, which must take place at least once a year.

In the course, participants will become familiar with the current content of the relevant regulations and receive practical guidance on how to implement them in daily operations. This enables better recognition and assessment of hazards associated with electrical work. Additionally, participants will learn appropriate and effective safety measures for accident prevention and will be able to apply them safely.

CONTENT

- Raising awareness for occupational safety in the electrical sector: Dangers of electric current, accidents
- Accident examples from practice
- DGUV Regulation 3 (formerly BGV A3) „Electrical Installations and Equipment“
- Requirements for persons working in the electrical field
- The 5 safety rules (working in a de-energized state)
- Operation and handling of electrical installations
- TRBS 1203 „Qualified Persons“

COURSE DURATION
1 day

MINIMUM PARTICIPANTS
4 People

HYDRAULICS FOR MAINTENANCE STAFF OCCUPATIONAL SAFETY

TARGET GROUP

Maintenance technicians | Service technicians | Installers | Designers | Engineers | Hydraulic service providers | Occupational safety specialists | Sales representatives

REQUIREMENTS

- Activity in the field of expertise
- Technical Training

DESCRIPTION | IMPLEMENTATION

Safety in hydraulic maintenance should always be the top priority. This course provides valuable information that can save lives.

The training aims to recognize hazards, prevent accidents, and avoid damage. It also addresses the correct approach in the event of unforeseen occurrences.

The course encourages participants to reflect on their own behavior, develop an awareness of hazards, and consistently prioritize safety for themselves and others.

CONTENT

- Structure and function of hydraulic hose lines
- Safety according to DGUV Information 209-070
- Maintenance of machines, systems, and vehicle attachments with hydraulic equipment
- Working with hydraulic components
- Focus on hose, pipe, and connection technology
- Recognizing hazards
- Risk assessment
- Regulations and rules
- Behavior-based occupational safety
- Inspections

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

QUALIFIED PERSON FOR HYDRAULIC HOSE LINES ACCORDING TO BETRSICHV, TRBS 1203 AND DGUV 113-020

TARGET GROUP

Maintenance technicians | Service technicians | Installers | Designers | Engineers | Hydraulic service providers | Occupational safety specialists

REQUIREMENTS

- Activity in the field of expertise
- Technical Training

DESCRIPTION | IMPLEMENTATION

According to the Industrial Safety Regulation (BetrSichV), every company is required to conduct a documented visual inspection of hydraulic hose lines on machines, aggregates, and equipment at least once a year. This inspection may only be carried out by „competent persons."

The course provides technical knowledge as well as the relevant legal requirements for hydraulic hose lines.

Upon successful completion of the test, there is the possibility of being designated as a „competent person," provided the other requirements are met.

CONTENT

- Physical and system engineering basics of hydraulics
- Function of hydraulic systems
- Structure and function of hydraulic hose lines
- Manufacturing, labeling, and assembly
- Hazards
- BetrSichV – Industrial Safety Regulation
- TRBS 1203 – Competent Person
- Tasks and responsibilities
- Safety rules according to DGUV 113-020 for hydraulic hose lines and hydraulic fluids
- Final examination

COURSE DURATION
2 days

MINIMUM PARTICIPANTS
4 People

IMPORTANT INFORMATION

Participation in the training by QTE Training provides the necessary knowledge to avoid hazards and comply with legal regulations.

APPRENTICE ACADEMY

From trainee to tomorrow’s maintenance technician

Trainees can bring along questions from their everyday work, which are then discussed together.

In-company training and the quality of training in the company are improved and increased.

Valuable consolidation of theoretical knowledge from vocational school.

Effective practical training for your trainees.

"I wish I‘d had the training in the first year of my apprenticeship. It would have helped me a lot."
Berke D., 2nd year apprentice, Vitaqua company

SIMATIC | TIA PORTAL FOR TRAINEES

TARGET GROUP

Trainees specialising in electronics for automation technology I Industrial electricians I Mechatronics engineers

REQUIREMENTS

- Basic knowledge of PC and Windows required
- Theoretical basic knowledge according to the vocational school curriculum

DESCRIPTION | IMPLEMENTATION

This course teaches basic knowledge of operating the Siemens TIA Portal. Practical examples provide the necessary user knowledge to be able to use the software safely in maintenance.

The aim of the training is targeted troubleshooting in preparation for the tasks after the exam. Participants have the opportunity to bring in questions from their day-to-day work and discuss them together.

The training content is presented using multimedia, with typical application examples reinforcing the theoretical knowledge. There is ample opportunity to apply the skills learnt in handling S7-1500 automation devices in practice, both on real devices and on a simulation model.

CONTENT

- Familiarisation with hardware components of the SIMATIC S7- TIA family
- Working with the TIA Portal software interface
- Development of S7 programmes in KOP / FUP, possibly other programming languages
- Using the online functions of the TIA Portal
- Creating a PROFINET connection
- Entering, reading and interpreting programmes
- Getting familiar with with functions, function blocks and data blocks
- Familiarisation with Boolean, arithmetic and conversion functions
- Eliminating sources of error with the help of observation tables, diagnostic buffers and cross-reference lists
- Identifying and rectifying malfunctions using an exercise model
- Insight into the integrated WinCC Basic

COURSE DURATION
5 days

MINIMUM PARTICIPANTS
4 People

HYDRAULICS FOR TRAINEES

TARGET GROUP

Apprenticeship professions in the fields of Industrial Mechanic | Metal Technology Specialist | or similar.

REQUIREMENTS

- Trainee in a technical profession

DESCRIPTION | IMPLEMENTATION

In many technical professions, a basic understanding of hydraulics is part of the training. However, this is often not sufficient to fully understand and apply hydraulic systems.

This course covers essential hydraulic fundamentals, various components, and how to read hydraulic circuit diagrams. Theoretical knowledge is brought to life through hands-on exercises using training systems.

The course is designed for participants who are undergoing training in this field and have no prior experience.

CONTENT

- What is Hydraulics
- Physical principles of hydraulics
- Circuit symbols according to DIN ISO 1219 and DIN ISO 1219-1
- Force/pressure and speed
- Hydraulic pumps
- Pressure relief valves
- Fittings, pipes, hoses, valves
- Hydraulic cylinders
- Hydraulic fluids, tanks, filters
- Advantages and disadvantages of hydraulics

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

PNEUMATICS FOR TRAINEES

TARGET GROUP

Apprenticeship professions in the fields of industrial mechanic | metal technology specialist | or similar.

REQUIREMENTS

- Trainee in a technical profession

DESCRIPTION | IMPLEMENTATION

Pneumatics is an essential component of many technical training programs. External experts are often consulted to supplement both in-company and inter-company training.

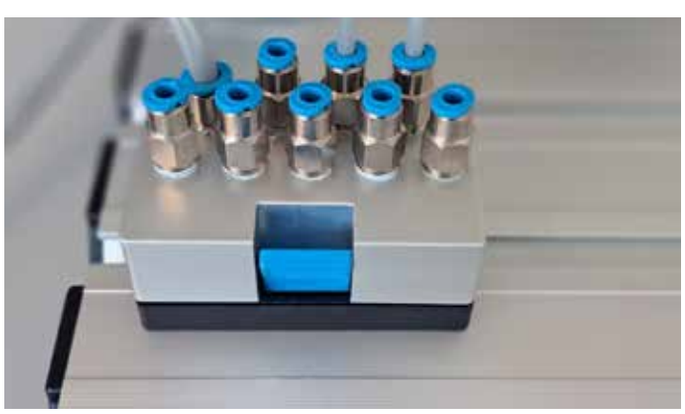
This course provides independent expertise in pneumatics, designed practically for trainees, and is content-aligned with pneumatic courses for maintenance personnel.

CONTENT

- Function and Application of Pneumatics
- Physical quantities and units in pneumatics
- Properties of the medium air
- Advantages and disadvantages of pneumatics
- Compressed air generation, drying, distribution, energy conversion
- Preparation unit
- Actuators (cylinders, rotary drives, etc.)
- Directional control valve technology, flow control valves
- Selection criteria for intake and exhaust throttling
- Shuttle valves, dual-pressure valves, pneumatic AND/OR
- Time or delay valves, sequence valves
- Circuit symbols according to DIN ISO 1219
- Troubleshooting

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People



ELECTROPNEUMATICS FOR TRAINEES

TARGET GROUP

Apprenticeship occupations in the fields of industrial mechanic, skilled metalworker or similar.

REQUIREMENTS

- Trainee in a technical profession

DESCRIPTION | IMPLEMENTATION

Electropneumatics is a key component of many technical training programs. Often, the expertise of external specialists is also utilized to support both intercompany and company-specific training areas.

This course provides independent expertise in electropneumatics, tailored for trainees and is content-wise aligned with pneumatic courses for maintenance personnel.

CONTENT

- What is pneumatics
- Physical fundamentals of pneumatics
- Basics of electrical engineering in pneumatics
- Electropneumatic control technology
- PLC basics
- Circuits
- Function diagrams
- Pressure vessels
- Circuit symbols and circuit diagrams according to DIN ISO 1219
- Faults in pneumatic systems

COURSE DURATION
3 days

MINIMUM PARTICIPANTS
4 People

VISION & MISSION

QTE TRAINING: VISION

Our vision is to create a world in which education is accessible to you without limits and you can realise your full potential. We strive to develop innovative learning solutions that promote your individual abilities.

QTE TRAINING: MISSION

Our mission is to provide you with high quality learning content tailored to your different needs. We utilise cutting-edge technology and pedagogical approaches to create learning environments that inspire, motivate and deliver results.

QUALITY STANDARDS

We are not standing still.

We want to inspire you with our service and use your suggestions and feedback as the basis for the continuous development of our processes. As a training participant, you will benefit from continuous improvements and adjustments.

DEVELOPMENT | INNOVATION

Standing still means going backwards.

We think long-term for you- with foresight and perspective. We are constantly reviewing our company processes and adapting our further development to technical requirements and your wishes.

WE TAKE ACTION

Working together as equals is important to us!

In our dealings with you, our customers and partners, we practise fairness, trust, openness and flexibility.

TRANSFER OF KNOWLEDGE

With a target group-orientated approach, we offer you an optimal learning outcome and our practical experience will convince you!

MEET OUR **TEAM**


WOMEN EMPOWERMENT


WE HIT THE MARK WITH YOU


EXPERTISE


MAKE YOUR MAINTENANCE GROW


ENJOYING THE JOB


WE WANT TO INSPIRE


ACHIEVING MORE IN HARMONY


SIMPLY BETTER TOGETHER


INNOVATION THROUGH CO-OPERATION


SUCCESS THROUGH TRUST


TOGETHER TO NEW HEIGHTS


BEST CUSTOMER SERVICE


SUCCESSFUL TEAMWORK


OUR COMMON VISION


Flexibility makes the difference

No matter what challenges a company may face, a well-functioning team can overcome them more quickly, easily and efficiently. We have long recognised this and have been focusing on a harmonious working environment with flat hierarchies and balanced communication for years.

You benefit from our motivated team. Whether in the office or directly at your site - we impress with our professional expertise and enjoyment of our work.

QTE GROUP

STRONG TOGETHER FOR YOUR SUCCESS

As a system-independent partner for automation technology, we develop customised solutions for you in machine and plant automation. Our industry focus is on the automotive and supplier industry, but our solutions are also increasingly in demand in areas such as pharmaceuticals, food, water and wastewater technology.

Our employees are active both in Germany and abroad to successfully realise your customer projects in the field of automation - including Industry 4.0. Together with our partners, we pursue the vision of making processes more efficient, safer, cheaper and easier to operate. We also systematically pass on the knowledge we have gained to you.

QTE SERVICE & SYSTEME

PROJECT MANAGEMENT AND SUPPORT IN THE FIELD OF INDUSTRIAL AUTOMATION

QTE SuS is your partner for automation technology and control solutions, whether for new or existing systems, from small applications to complex systems. With our customised solutions, we support you from conception to commissioning with state-of-the-art control technology, placing great emphasis on innovative and efficient approaches.

Thanks to our expert's decades of experience, we are proficient in all common PLC programming standards and can set up almost any robot, regardless of the manufacturer and model. We also pass on our knowledge to your employees in our PLC training courses.

We are happy to advise and support you in optimising your automation processes- in all industrial sectors.

- AUTOMATION TECHNOLOGY
- PROJECT MANAGEMENT
- BUILDING AUTOMATION I SMART HOME
- INDUSTRIAL AUTOMATION

☎ +49 561 94033301
✉ info@QTE-sus.com



QTE TRAININGBOX

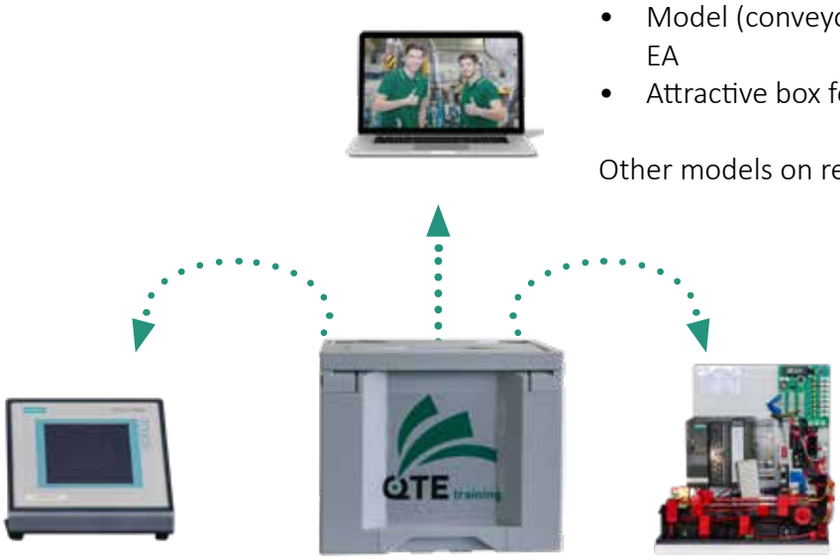
LEARNING SUSTAINABLY

Many have expressed the desire to deepen or refresh the knowledge acquired in the training courses. Hoˆwe¬ver, the appropriate control system is often lacking, as the systems in production usually only allow interˆven¬tion in the event of a fault, which is not ideal for learning purposes. This is why a proven and tested hardware is offered as a QTE Trainingbox.

The QTE QTE Trainingbox contains a comprehensive package of control components with which all training tasks can be simulated on the basis of the Siemens TIA. This allows the expertise acquired in the training courses to be expanded and consolidated.

- TIA Station (S7 1511-1PN, DI/DQ 16 module plus connection module from WAGO with various digital and analogue I/Os)
- PROFINET- connection to the interface module
- Eight switches/buttons and LEDs for simulating EA
- 0...20mA source including digital display as signal source for analogue input
- Model (conveyor belt with punch) incl. wiring to PLC-EA
- Attractive box for transport and storage

Other models on request (e.g. Beckhoff)



OUR TIP

In order to store what has been learnt in the long-term memory, the new knowledge must be processed by the working memory. What the working memory cannot link in a meaningful way within a short time is often lost. Through repetition, what has been learned is internalised more strongly and ‘empty kilometres’ are minimised.

ONLINE TRAINING COURSES

QTE TRAINING ONLINE

USE YOUR POTENTIAL SENSIBLY

Every company is currently facing the challenge of providing urgently needed knowledge while remaining cost-efficient. Our online training courses offer the advantage of eliminating travel and accommodation costs, which means that more employees can be trained for the same budget.

In the live online training courses, the important training content is conveniently conveyed via live streams. The instructors can connect live to the system model at any time and are in direct dialogue. The technical requirements are clarified before the training.

TECHNICAL REQUIREMENTS

PC/Laptop with a screen size of at least 15 inches and connection to the Internet.	2nd monitor with a screen size of at least 20 inches.	Headset	A minimum of 16 Mbit/s download speed.

INCLUSIVE

easier than you thought!

- High-quality seminar documents for download
- Cloud server (virtual computer) with access to Siemens TIA Portal / S7 / Beckhoff
- Provision of TIA Portal licences
- Communication via Microsoft Teams
- Factory I/O with a virtual, digital system model for fault and error simulation

OUR TIP

In today‘s fast-paced world, online training is an important way to acquire knowledge and skills. To make the most of these learning opportunities, a stable internet connection and active participation are crucial.

BILINGUAL LEARNING

All training courses are now also available in **English**.

CONTACT DETAILS

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WELLNESS

BALOU

Wellness Manager

QTE TRAINING | TEAM

QTE employs 25 dedicated trainers and employees who are characterised by their outstanding expertise and strong team spirit. Each individual contributes their specific knowledge and experience to optimally fulfil the needs of our customers, and our team brings together specialists from various fields such as technical maintenance, programming, PLC programming and maintenance.

With in-depth expertise in the application and optimisation of hydraulic systems as well as in control and automation technology, we stand for excellent solutions and tailored advice.

The QTE team stands for reliability, quality and customer-orientation - in every project and in every step we take together.

OUR PARTNERS

AUTOMOTIVE | SUPPLIER

Adam Opel AG
BENTELER Group
BMW Group
Borbet GmbH
Continental Reifen Deutschland GmbH
ContiTech Schlauch GmbH
Deutz AG
Ford Werke GmbH
Gestamp Griwe GmbH
Hella KGaA Huck & Co
KSM Castings Group GmbH
Lühr Filter GmbH
Magna Exteriors GmbH
Robert Bosch Elektronik GmbH
Schuler Group
SODECIA Safety & Interiors Attendorn GmbH
VINCENZ WIEDERHOLT GmbH
Volkswagen AG
ZF Friedrichshafen AG

STEEL INDUSTRY

RHI Magnesita GmbH
Speira GmbH

PHARMACEUTICAL INDUSTRY

B.Braun Melsungen AG
CSL Behring GmbH

FOOD & BEVERAGE

ARDAGH Group
Haus Cramer KG
Melitta Europa GmbH
Vitaqua GmbH
Warsteiner Brauerei

OTHER INDUSTRIES

Aerzen
Axor
Hansgrohe SE
MeisterWerke
RWE
Schulte GmbH
Miele & Cie KG
Stabilus GmbH
Viessmann
WILKA Schließtechnik GmbH

QUALITY CREATES CONFIDENCE

This is reflected on the many years of co-operation with our customers. Many renowned companies from a wide range of industries rely on the quality of QTE Training GmbH.

We are happy to provide further information about our satisfied customers on request.

Ford
Opel
AXOR
RHI MAGNESITA
STABILUS
Miele
DEUTZ
hansgrohe
ArdaghGroup
SODECIA
Continental
GESTAMP GRIWE
MAGNA
HELLA
BENTELER
speira
VIESMANN
WILKA SCHLIESSTECHNIK
Warsteiner
B BRAUN SHARING EXPERTISE
VITAQUA
Melitta
BMW GROUP
MEISTERWERKE
BORBET
WIEDERHOLT
AERZEN
RWE
VW

CUSTOMER **REVIEWS**

★ ★ ★ ★ ★

‘Very good training, you immediately felt more confident in handling the hydraulic systems than before.’

★ ★ ★ ★ ★

Daniel S.
(Viessmann Group GmbH & Co. KG)

‘Excellent course, also suitable for refreshing hydraulic basics.‘

★ ★ ★ ★ ★

Oliver S.
(Continental AG)

‘Expectations were completely fulfilled, trainer organised, motivated and professionally competent.‘

★ ★ ★ ★ ★

Carolin D.
(Ford-Werke GmbH, Köln)

‘The course was very interesting; I saw and learnt a lot of new things.‘

★ ★ ★ ★ ★

Christian K.
(Gestamp Griwe GmbH)

At QTE Training, our primary goal is for you to complete our courses with the highest level of satisfaction and success. We attach great importance to ensuring that your knowledge and the skills you acquire are not only convincing in theory, but also in practice. Our dedicated team and our tailor-made training programmes are designed to optimally prepare you for your challenges and ensure lasting learning success.

Our excellent ratings on Google and ProvenExpert confirm that we are achieving this goal.

Google

QTE Training GmbH

Proven Expert

Kundenbewertungen

171 Bewertungen

OUR LOCATIONS

HEADQUARTER **VELLMAR**
Kirchweg 17
34246 Vellmar

SALES OFFICE **AUGSBURG**
Steinerne Furt 72
86167 Augsburg

QTE TRAINING - NOW AT THREE LOCATIONS!

We are based in Kassel and have been your first port of call for professional training for years. Our head office in Vellmar near Kassel is particularly easy for you to reach, whether you are travelling from Germany or anywhere in Europe.

The central location ensures short travel times and we have extended our reach: you can now also find us at our new sales locations in Berlin and Augsburg. Visit us at one of our locations and experience training at the highest level, customised to your individual needs.

LOCATION SOUTH GERMANY

LOCATION SOUTH GERMANY

Our key account and sales expert Alexandra is the reliable contact person for southern Germany. With her commitment and experience, she provides support for all questions and bookings in connection with our seminars in southern Germany.

ALEXANDRA BROCKFELD
Key Account Managerin South Germany
a.brockfeld@QTE-Training.de
phone: +49(0)561.94033322

TERMS AND CONDITIONS

1. SCOPE:
All trainings according to the QTE Training catalogue and individually agreed trainings of QTE Training GmbH are exclusively subject to the General Terms and Conditions. Any deviating terms and conditions with the customer shall only apply with the express consent of QTE Training GmbH.

2. SCOPE OF SERVICES:
The scope of training services includes the organisation of the respective training courses at the agreed location, the provision of hardware, training documents and a confirmation of participation. The description of the training content corresponds to the standard of the QTE Training GmbH catalogue at the time of issue of the catalogue. QTE Training GmbH expressly reserves the right to make changes or adjustments to the content during the training course. For customised training courses, the respective scope of services must be defined accordingly. The customer is entitled to a confirmation of participation if he attends more than 80% of the training programme. The customer guarantees that the scope of services will be used exclusively for the customer‘s direct purposes and not for third parties, unless otherwise agreed in writing.

3. REGISTRATION, DATA PROCESSING:
Registrations are made in writing using the registration form on the website or by written order. After receipt of the order, the customer will receive an order confirmation regarding the training ordered, the location, date and price. Furthermore, the customer agrees that the personal data contained in the registration form may be stored and processed by QTE Training GmbH.

4. PRICES AND TERMS OF PAYMENT:
The prices for the training courses are listed in the catalogue appendix - current status - or can be agreed for individual training courses. In principle, the customer will receive a corresponding offer in advance. Accommodation and travelling expenses are to be borne by the customer. Unless otherwise agreed, prices are quoted in euros excluding VAT and other fees or expenses and are subject to change. The customer will receive an invoice after registration, which is payable within 14 days of the invoice date, net, free of charges and deductions, but no later than the start of the training.

5. CANCELLATION:
The customer has the right to nominate substitute participants before the start of the training, provided that QTE Training GmbH has no justified objections exist. For agreed to but not utilized training courses QTE Training GmbH charges as follows: Cancellation in writing up to 4 weeks before the start of the training course is free of charge. Cancellations up to 3 weeks before the start of the training will be charged 50% and up to 2 weeks before the start of the course, 70% of the course fees will be charged. After a period of up to 2 weeks, the course fee must be paid in full amount. Should a participant be unable to attend due to illness or serious reasons and it is no longer possible to cancel the course is no longer possible to cancel the course free of charge, QTE Training GmbH may issue a voucher that entitles the participant to participate at a later date set by
date determined by QTE Training GmbH.

6. RESERVATION OF RIGHT TO AMEND:
QTE Training GmbH reserves the right to change the location and/or time of announced or agreed training courses if this is necessary for objective or legally justified reasons (e.g. if the number of participants is too low, the trainer is ill, national or international regulations, sanctions or similar) or to replace the trainer. In the event of a complete cancellation, the prices paid will be refunded. In the event of a change of time or location, the customer has the right to cancel in writing and free of charge within 3 calendar days of receiving notification of the change. Otherwise, the change shall be deemed to have been agreed in accordance with the new conditions. The customer waives the right to assert claims for wasted expenditure or other claims for damages and expenses.

7. ONLINE TRAINING COURSES:
QTE Training provides the customer with training hardware as part of the webinar. This remains the property of QTE Training GmbH. In the event of damage, QTE Training GmbH reserves the right to charge the customer for this.

8 INHOUSE TRAININGS:
In the case of in-house training courses, the customer must ensure that the training can be conducted in compliance with regulations of the Infection Protection Act.

9. SAFETY REGULATIONS:
The participant commits to comply with an applicable safety, accident prevention and order regulations, as well as instructions and special access regulations on the premises of QTE Training GmbH.

10. LIABILITY:
Both in the training documents and during the training, technical information is provided by QTE Training GmbH to the best of its knowledge and belief. However, QTE Training GmbH does not guarantee that this information is always free of errors. QTE Training GmbH is liable for any damage caused to the customer within the scope of its business liability insurance, up to the net amount of the training price. Furthermore, QTE Training GmbH is liable for damages caused by intent or gross negligence. Liability for slight negligence, compensation for consequential damages, pure financial losses, loss of profit and damages from claims against third parties against the customer are excluded, as is liability for the success of the training. In the event of damage to the customer‘s data carrier material, the obligation to pay compensation does not include the cost of recovering lost data. Further claims for damages, regardless of the legal grounds, are excluded. Insofar as the training courses take place on the customer‘s premises, QTE Training GmbH shall not be liable for accidents, loss or damage to the customer‘s property, unless the damage was caused wilfully or through gross negligence.

11. COPYRIGHT, COPYRIGHT PROTECTION AND CONFIDENTIALITY:
All documents provided by QTE Training GmbH are the intellectual property of QTE Training GmbH and/or third parties. They may not be passed on or reproduced without the express authorisation of QTE Training GmbH. The software provided by QTE Training GmbH for the purpose of training may not be extracted or copied in whole or in part. The customer is liable for any offence.

12. MISCELLANEOUS PROVISIONS:
Should individual provisions be or become invalid and/or unenforceable in whole or in part, all other provisions shall remain valid. The same applies to any corresponding loopholes not mentioned.

13. APPLICABLE LAW/PLACE OF JURISDICTION:
The place of jurisdiction for the customer for all legal disputes arising from or in connection with the contractual relationship is exclusively the court in Kassel with subject-matter jurisdiction for QTE Training GmbH. QTE Training GmbH is, however, entitled to bring an action in any other court that may have jurisdiction under national or international law. German law shall apply exclusively to all legal transactions, in particular those based on these training conditions. Excluded from this are reference norms, in particular those of international private law, insofar as these refer to the application of international law. If German law provides for the application of special international substantive standards that also apply in Germany - such as the UN Convention on Contracts for the International Sale of Goods - these shall not apply.

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