

FAST MOVING TECHNOLOGY

STÄUBLI

Training program

Robotics | Experts in Man and Machine



OUR IDENTITY

Stäubli history and DNA

Stäubli is a global industrial and mechatronic solution provider with four divisions: Electrical Connectors, Fluid Connectors, Robotics and Textile. We enable customers to increase their productivity in a wide range of industrial sectors.



Originally founded in 1892 as a small workshop in Horgen (Zurich), today Stäubli is an international group headquartered in Pfäffikon, Switzerland, operating with over 6,000 employees in 28 countries on four continents.

Stäubli focuses on differentiation and growing businesses with strong future potential. Operational excellence as well as strate-

gic investments enable us to grow and take a leading position in defined businesses and markets. Innovation and sustainability are part of Stäubli's DNA: High-quality industrial and innovative mechatronic solutions and proximity to the customer will remain success factors.

Passion and a family spirit make Stäubli unique. Our people make the difference –

therefore we continuously invest in the development of our employees. Quality and reliability have been the driving force of Stäubli since 1892. Long-term business activities and independence are key factors in our success.

OUR DIVISIONS

An international group with a passion for innovation

Stäubli Electrical Connectors develops unique technological solutions for every industry. Our electrical connectors, designed for standard or custom applications, meet the highest requirements for efficiency, productivity and quality. We create connections for life.

At Stäubli Fluid Connectors, we cover connection needs for all types of fluids, gases and electrical power. Our standard and specialized products, including quick and dry disconnect couplings, multiconnection solutions, safety breakaway couplings, tool changers, and quick mold change systems combine performance, quality, safety, dependability and durability.

Stäubli Robotics' unique product portfolio contains four- and six-axis industrial robots, cobots, mobile robot systems and AGVs. These powerful, high-precision solutions enable customers in many demanding industries to tackle the challenges of Industry 4.0 under specific manufacturing conditions.

Starting as a technological pioneer and reliable partner in the weaving industry, Stäubli Textile has been developing and producing high-quality systems since 1892. Our comprehensive range of proven machines and automation solutions allows weaving mills to optimize their production process and increase productivity.



Electrical Connectors



Fluid Connectors



Robotics



Textile



TRAINING AT STÄUBLI

Optimize your robotics skills

Stäubli's Robotics training take place around the globe. We provide various training courses that cover all aspects of robotic systems. Participants will acquire the skills essential for robot operation and maintenance. Applying this exper-

tise will ensure that the robots achieve consistently high productivity levels. Trained personnel are a prerequisite for reliable and productive operation of your systems.

Reasons for training:

- **Workplace safety levels are enhanced through adherence to correct procedures:**
Training at all levels, from production planning to operators and supervisors is essential for the safe and efficient operation of the robot. Workplace safety levels are therefore enhanced through adherence to correct procedures.
- **Increase plant availability:**
Minimize production downtime through an ongoing program of targeted training for your employees.
- **Increasing efficiency:**
Having appropriately trained personnel fine tune your production systems is the key to increasing productivity levels.
- **Quality assurance through trained Personnel:**
A company with EN ISO 9001:2015 certification is obliged to train its staff so that the company's quality goals can be achieved and maintained.



ROBOTICS ACADEMY

Training in Germany and Austria

The Robotics Academy offers hands-on training, with numerous opportunities to acquire various skills. Participants gain the know-how and confidence needed to use their robot systems efficiently and effectively. To minimize travel for our customers, our training courses are available at three separate locations: Bayreuth, Hannover and Asten.



Advantages of training at the Robotics Academy:

- Trainers with industry expertise:**
All courses are conducted by highly qualified, experienced engineers and technicians from our customer service and support department. Those participating in training benefit from many years of experience across multiple industry sectors with a wide variety of robot systems.
- Application focused exercises:**
With years of field-based experience, our training team is familiar with numerous robotic systems and a wide range of applications. Training can therefore be tailored to suit the participants, guaranteeing useful practical training exercises.
- Small training classes:**
Each course takes place in a small group, up to a maximum of eight people. This ensures that each participant can receive individual attention.
- Individually tailored training courses:**
For groups of four or more participants from the same company, it is possible to provide training based upon their specific systems and to suit the experience of the employees.
- On-Site training:**
If your company has the appropriate facilities and opportunities, training courses can also be held at your premises at an agreed time.

TRAINING OFFER

Your route to a robot expert

Based on years of experience and long term cooperation with our customers, we have developed a modern training program tailored to meet the specific needs of our clients, based upon the following modules:



Basic Training

Ensuring the safe operation of Stäubli robots.



Maintenance Training

Combining safe operation and performing certain in-house maintenance work and repairs.



Programming Training

Aimed at programming new robot systems, plus modifying and optimising previously programmed systems.



VAL 3 Update Training

An insight into the functionality of the new operating system and a refresh and update of existing knowledge.



Safety Training

An introduction to the safety standards relevant for robots, together with the configuration and use of the new safety functions Safe Speed, Safe Stop, Safe Zone and Safe Tool.



Current Course Offers
and Further Information



TRAINING

Basic Training

Content

- Overview of the system components
- Using the teach pendant
- Operating modes
- Safety aspects
- Application control
- Setting up path points
- Operating system settings
- Reading and editing data
- Basics of movement commands
- Management of analogue and digital inputs and outputs

Goal

This course teaches a range of skills, encompassing the safe operation of the system, reading operating system data, the competent set-up of start-up points, and cell-specific administration of inputs and outputs.

In addition, participants gain an overview of the mechanical and electrical components of the robot and its control system.

This course prepares maintenance technicians for TX2/TS2 CS9 systems for participation in a maintenance training.

This course prepares potential programmers of TX2/TS2/CS9 systems for participation in a VAL 3 programming training course.

Participants

System operators, setters, technicians, maintenance staff, programmers in preparation for programming training.

Benefits of Training

- Increased safety in the workplace environment through competent handling of the machine and the system
- Improving the confidence of participants when handling the robot system
- Saving time in the production process through reduced set-up times, competent operation, increasing the operational readiness of the system and reducing wear and tear.
- The ability to independently assess and identify the source of any malfunction can significantly reduce system downtime.
- Trained and informed operators can contact the Stäubli hotline and receive a faster and more efficient response.

CS8C

Duration: 2.5 days
Course number: 8.1.1
Location: Bayreuth

CS9

Duration: 2.5 days
Course number: 9.1.1
Location: Bayreuth, Asten, Hannover

Prerequisites

none

Recommendation

Experience in the operation of computer controlled industrial machines

Please note!

The knowledge from the basic training course is assumed for participants in the maintenance training CS9 course and the CS9 programming training course, which is why we strongly recommend attending a basic training course in advance.





Maintenance training for robot systems of the CS8C generation



Participants

Electricians, electronics engineers, mechatronics engineers, technicians and engineers

Benefits for the participant

- More efficient cooperation between trained plant personnel and Stäubli service engineers during maintenance and service calls on site. This significantly reduces downtime and saves cost.
- The ability to identify potential opportunities to optimize the performance of the line. This not only reduces cycle times but also enhances the productivity level of the system.
- Participants learn how to independently carry out prompt and competent troubleshooting on the robot system.
- Unscheduled downtime can be reduced or even eliminated through preventive maintenance procedures or a competent assessment of the urgency of a repair.
- Reaction times, should a malfunction occur, are reduced by the prompt deployment of trained maintenance personnel.
- Trained personnel are better able to successfully implement advice and recommendations from the free Stäubli hotline.

Goal

This training course covers the different stages from operation of the system, start-up, and program execution to the administration of inputs and outputs. In addition, participants gain valuable knowledge relating to the electrical and mechanical components of the robot, essential maintenance work, up to level 2 as identified within the robot manual, and repairs that can be carried out by the trainees themselves.

Prerequisites

The professional suitability with regard to electrical safety.

Recommendation

Experience with the operation and maintenance of computer-controlled industrial machinery.

TX / RX CS8C

Content

- Content of the basic training course
- Commissioning of the robot
- Overview of the robot system
- General safety instructions
- Using the pendant
- Application control
- Editing data and teaching points

Diagnosis

- Booting the CS8C controller
- Configuration of the customer PC
- Optical displays (LEDs, displays on the control unit and on the arm)
- Error logger
- Pop-up window
- COM1 serial connection
- System messages
- Practical examples

CS8C controller

- Structure of the control system
- Power supply
- Electronic components - presentation, synoptics and troubleshooting
- Absolute calibration and testing of the reference points
- Inputs and outputs

Mechanics

- Description of the components
- Presentation of the JCM
- TX wrist - structure
- Axis 5 motor
- Gear motor axis 6
- Toothed belt check TX40/TX60
- JT 3/4 motor exchange TX40/TX60
- DSI board - function
- Wiring harness - protection and testing
- Phase alignment of displacement encoder
- Preventive maintenance up to level 2

Duration: 4.5 days

Course number: 8.2.1

Location: Bayreuth



TS / RS / TP80 CS8C

Content

- Content of the basic training course
- Commissioning of the robot
- Overview of the robot system
- General safety instructions
- Using the pendant
- Application control
- Editing data and teaching points

Diagnosis

- Booting the CS8C controller
- Configuration of the customer PC
- Optical displays (LEDs, displays on the control unit and on the arm)
- Error logger
- Pop-up window
- COM1 serial connection
- System messages
- Practical examples

CS8C controller

- Structure of the control system
- Power supply
- Electronic components - presentation, Synoptics and troubleshooting
- Calibration and testing of reference points
- Inputs and outputs

Mechanics

- Description of the components
- Mechanical components
- Replace gearbox JT 1/2 (RS only)
- Replace stroke turning spindle JT 3/4 and remeasure
- Re-adjust robot
- Load, save and change machine parameters
- DSI boards
- Systematic troubleshooting and – elimination
- Preventive maintenance up to level 2

Location: Bayreuth



Duration: 4.5 days

Course number: 8.2.2



Maintenance training for robot systems of the CS9 generation

Goal

During the training course, participants learn all about the structure, electrical and mechanical components of the robots, necessary maintenance work and repairs that they are able to carry out themselves. A further component of the training course is reading out of the event log and structured, independent troubleshooting.

Participants

Electricians, electronics engineers, mechatronics engineers, technicians and engineers

Please Note!

The practical ability to safely operate Stäubli robots is a prerequisite. As preparation for this course, it is therefore strongly recommended to attend the basic training module in advance.

Benefits for the participant

- More efficient cooperation between trained plant personnel and Stäubli service engineers during maintenance and service calls on site. This significantly reduces downtime and saves cost.
 - The ability to identify potential opportunities to optimize the performance of the line. This not only reduces cycle times but also enhances the productivity level of the system.
 - Participants learn how to independently carry out prompt and competent troubleshooting on the robot system.
 - Unscheduled downtime can be reduced or even eliminated through preventive maintenance procedures or a competent assessment of the urgency of a repair.
 - Reaction times, should a malfunction occur, are reduced by the prompt deployment of trained maintenance personnel.
- Trained personnel are better able to successfully implement advice and recommendations from the free Stäubli hotline.

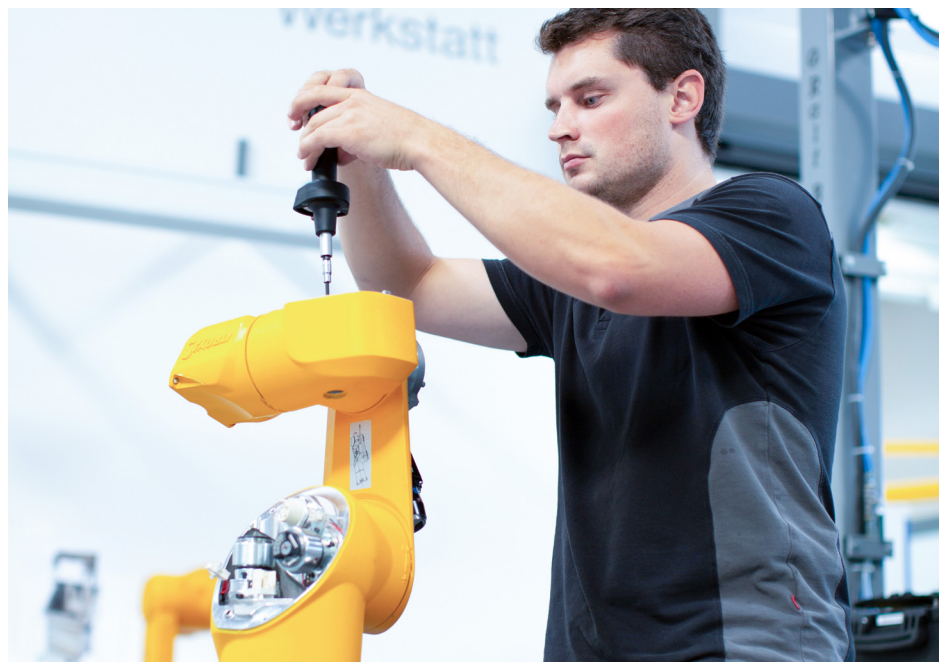
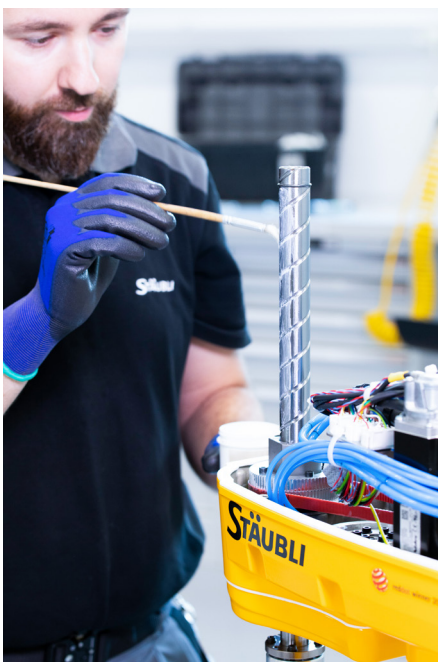
Prerequisites

Basic knowledge of robot operation (CS9), as well as professional qualification regarding electrical safety.

Recommendation

Participation at the basic training CS9

Experience with the operation and maintenance of computer-controlled industrial machines.



TX2 / TS2 CS9

Content

- General safety instructions
- Commissioning of the robot
- Safety settings related to carrying out maintenance and repair work
- Overview of the robot system
- Practical exercises for troubleshooting
- Technical database:
 - Spare parts catalogue
 - documentation (manuals, FSP)

Diagnosis

- Booting the CS9 control unit
- Optical displays (LEDs, displays on the controller and on the arm)
- Error logger
- System messages
- Practical examples of structured troubleshooting according to Stäubli „Break-down Diagram“

CS9 controller

- Structure of the control system
- Power supply
- Electronic components: explanation, synoptics and troubleshooting
- Calibration and testing of the reference-points
- Explanation of the existing inputs and-outputs
- Creating a backup of the system data- and the safety configuration
- Arm and control unit replacement
- Control of the holding brakes
- Replacing components

Mechanics TX2

- Description of the components
- Presentation of the JCS gearbox variants
- TX2 wrist – structure and function
- Toothed belt check TX2-40/TX2-60
- DSI 9 board - function
- Wiring harness - protection and testing
- Component replacement:
 - Motor
 - BEM (brake encoder module)
 - Wrist
 - Toothed belt
 - DSI 9 board
- Preventive maintenance up to level 2

Mechanics TS2

- Description of the components
- Presentation of the JCS gearbox variants
- Available equipment
- Toothed belt check
- DSI9 board - function
- Wiring harness – visual check
- Component exchange
 - engine
 - timing belt
 - DSI 9 board
- Preventive maintenance up to level 2
- Quill maintenance



Duration: 4.5 days

Course number: 9.2.1

Location: Bayreuth, Asten



Programming Training

Goal

This course enables the participant to create typical industrial applications in the VAL 3 programming language or to competently manage and modify programs from existing installations.

Participants

Persons involved in the programming of robot systems.

Please note!

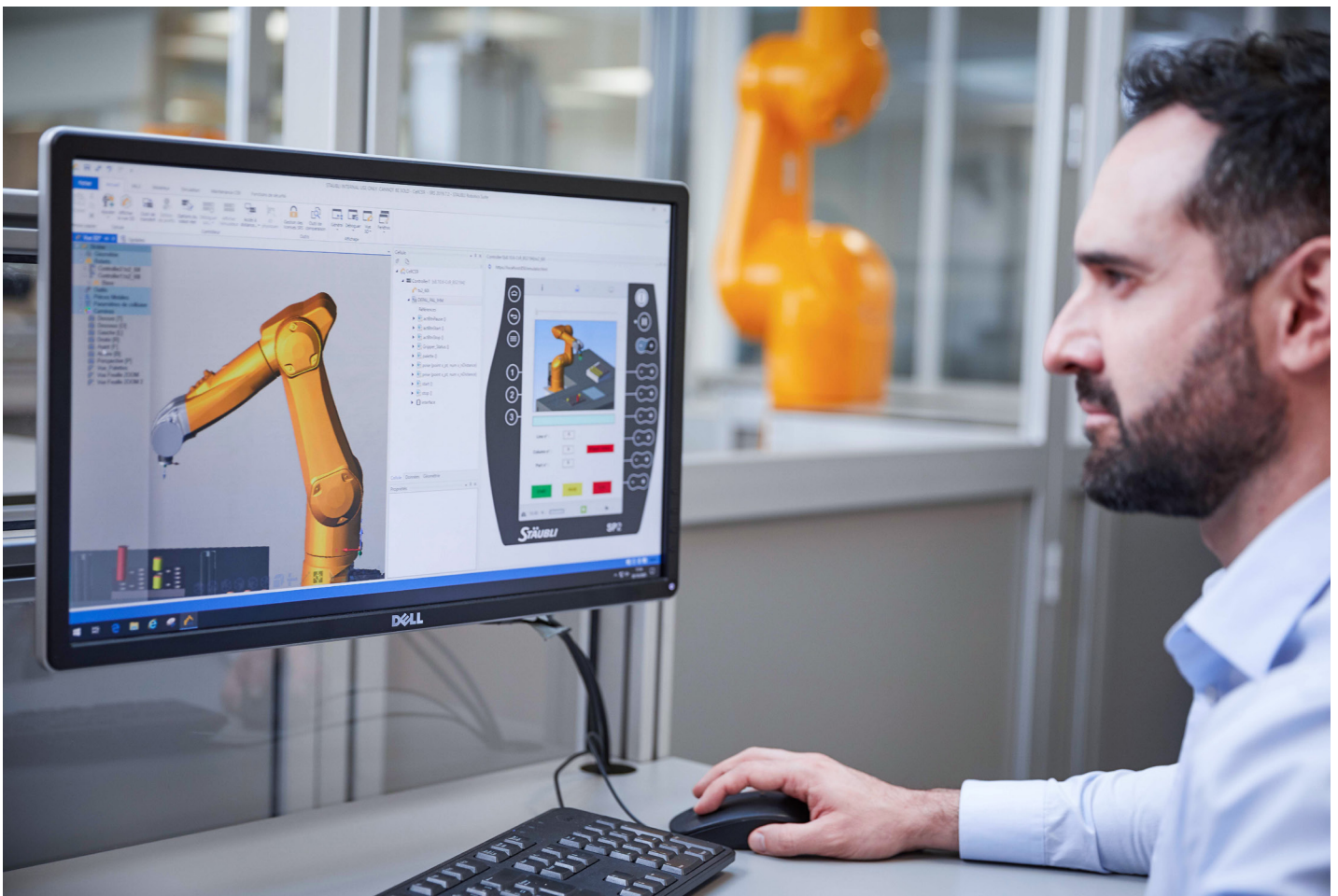
The practical skills to safely operate Stäubli robots are a prerequisite. As preparation for this course, especially for CS9, it is strongly recommended to have previously attended the basic training module.

Benefits for the participant

- The course facilitates confident operation and the skills needed to switch to application development with VAL 3.
- The participant learns to use the Stäubli Robotics Suite software for programming and troubleshooting.
- The participant will acquire the ability to implement robot movements in a maintenance and wear-friendly manner, and thereby avoiding excessive load on the robot, which can lead to increased numbers of malfunctions and failures at an early stage.
- Efficient fault management in the VAL 3 application to clearly identify the root cause of the problem and enable a prompt restart ensuring minimal downtime in the case of an issue.

Prerequisites

- Confident use of a PC and knowledge of Windows applications
- General understanding of the logical structure of programs in a higher programming language such as Basic, Pascal, C or Java with regard for example, to: variable management, program loops, querying of conditions, etc.
- Handling of the Stäubli pendant, teaching of points



VAL 3 for CS8C

Prerequisites

none

Recommendation

Preparatory participation in the basic training CS8C is recommended.

Contents

- Safety instructions
- Creating and editing programmes
- Robot movements
- Debugging
- Digital inputs and outputs
- Structured programming
- Multitasking
- Three-dimensional arrays
- Collections
- User-defined structures
- Online Debugger
- I/O management
- Additional features
- Presentation of Stäubli software products, Stäubli Robotics Suite and its components
- Programming of the user page

Duration: 4.5 days

Course number: 8.3.1

Location: Bayreuth

VAL 3 for CS9

Prerequisites

Basic training CS9

Contents

- Safety instructions
- Creating and editing programmes
- Robot movements
- Debugging
- Digital inputs and outputs
- Structured programming
- Multitasking
- Three-dimensional arrays
- Collections
- User-defined structures
- Online Debugger
- I/O management
- Additional features
- Presentation of Stäubli software products, Stäubli Robotics Suite and its components
- The contents of the update training

Duration: 4.5 days

Course number: 9.3.1

Location: Bayreuth, Asten, Hannover

VAL 3 Update CS9

Prerequisites

Programming training CS8C or CS9

Contents

- User Page Designer
- Data Binding
- Security functions of CS9 compared to those of VAL 3
- CS9 Emulator
- Teach pendant SP2

Goal

Getting to know the new features of the CS9 operating system version 8.x

Duration: 2.5 days

Course number: 9.3.2

Location: Bayreuth, Asten, Hannover



TRAINING

Safety Training CS9



Safety functions CS9

Content

- Basics on relevant standards and the CE certification process
- Risk assessment process with the development of risk reduction measures
- Safety architecture of CS9
- Presentation of the individual functions
 - Cartesian zones
 - Cartesian speeds
 - Safe axis limits, speeds
 - Stop functions of the robot (SS0, SS1, SS2)
 - Safe tools
- Discussion of the functions, through the use of practical example
- Presentation of the configuration software Safe PMT and SRS
- Practical implementation on the topic using relevant examples and exercise

Goal

Identifying possibilities and the implementation of the new safety functions for system design and robot programming.

Participants

Designers, programmers, safety engineers

Prerequisites

none

Recommendation

- basic understanding of machine safety
- for programmers: Programming Training recommendable

Benefits for the participant

- Quick introduction to the configuration of the safety aspects in CS9 robot systems
- Elaboration on the relevance of the standards ISO 13849, 10218, 12100 and ISO/TS 15066 for the design of robot systems
- Assessment of the impact which the safety functions within CS9 have on existing operations, e.g. impact on cycle time, space requirements within the cell, and cell footprint
- Targeted implementation of modern safety concepts, especially with regard to the optimum design and integration of protective devices used for operator safety

Duration: 4.5 days

Course number: 9.5

Location: Bayreuth, Asten, Hannover



REGISTRATION FOR TRAINING

Your way to us

Book your training at one of our locations in Germany and Austria easily online via our MyStäubli portal.

To register in our MyStäubli portal, you only need to enter your contact details and the details of your company!

Besides our Robotics Academy platform, our MyStäubli portal gives you access to all

information about your robot system. Whether spare parts catalogue or Stäubli library, our online portal offers you a wide range of possibilities and information.

Become part of our Stäubli-community!

What can you expect from our new Robotics Academy platform?



Course booking

Book your seat in our trainings.



Access training catalog

View the entire training program for online and offline courses.



Course plans

View the entire training program for online and offline courses.

To portal



SERVICES

Focus on the customer

Stäubli Robotics in Bayreuth has consistently expanded its Customer Services:

Customer support

- Workspace / feasibility studies
- 3D simulations
- Cycle time studies
- On-site programming support
- Project-related real tests
- Remote maintenance

Hotline Technical Customer Support

Phone +49 921 883 33 03

Email: hotline.robot.de@staubli.com

After Sales Service

- Maintenance and repairs on site or in Bayreuth
- Fault analysis in the field
- Spare parts supply
- Maintenance contracts

Hotline After-Sales-Service

Phone +49 921 883 32 02

Email: hotline.robot.de@staubli.com

Training

- Modern equipment
- Practical exercises
- Small training groups
- On-site training
- Trainers with industry expertise

Robotics Academy training centre

Phone +49 921 883 3505

Email: training.robot.de@staubli.com

CUSTOMER VOICES

What our customers say

“The training met our expectations to the fullest extent. The transmission of the skills and abilities could not have been better or more effective.”

Sebastian Geißler

SolarWorld Industries Sachsen GmbH, Freiberg

“The training was very informative in both the theoretical and the practical areas.”

Thomas Wolf

Continental Automotive GmbH, Limbach-Oberfrohna

“It was a very helpful course with superb training conditions. There are no negative comments at all.”

Mario Koch

Robert Bosch Fahrzeugelektrik Eisenach GmbH, Eisenach





● Stäubli locations ○ Representations / Agents

Worldwide presence of the Stäubli Group

www.staubli.com