**Learning Path - IndraDrive**

**BASIC TRAINING**
- IndraDrive
  - EATG-1
    - Basic Knowledge of Electric Drive Technology  
  - *eEATG*
    - Basic Knowledge of Electric Drive Technology (eLearning)

**INTERMEDIATE TRAINING**
- 1st Generation
  - EAT-ID-1
    - IndraDrive – Diagnostics and Servicing
  - EAT-ID-Opt1
    - IndraDrive Drive Optimization

- 2nd Generation
  - EAT-ID-2
    - IndraDrive – Diagnostics and Servicing
  - EAT-ID-Opt2
    - IndraDrive Drive Optimization
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**EATG-1**

**Basic Knowledge of Electric Drive Technology**

From the function and properties of selected drive components to current developments: This training is recommended for anybody who wants to attend intermediate training courses.

**CONTENTS**
- Basic structure of energy conversion using electric drives (structure and effect)
- Electric motors, different operating principles, their properties and typical fields of application
- Motor encoders
- Drive control loops (torque, speed and position control loop) and their fields of application
- Frequency converters, how they work and fields of application, practical commissioning exercise
- Servo drive controllers, how they work and fields of application, practical exercises

**LEARNING OBJECTIVE**
- Getting an overview of electric drive technology
- Being familiar with and understanding components and concepts
- Learning about the different drive components, their fields of application and current trends
- Being familiar with the different motor types (synchronous, asynchronous) and their control procedures
- Gaining practical experience through exercises on the servo drive and the frequency converter

**TARGET GROUP**
- Operators, service technicians, planners/application engineers, managers, trainers

**DATE (GERMAN)**
- 05/14/2019–05/16/2019 Lohr am Main
- 11/26/2019–11/28/2019 Lohr am Main

**DATE (ENGLISH)**
- 10/08/2019–10/10/2019 Lohr am Main

**TRAINING TIME**
- 3 days:
  - Day 1  10:00 AM–4:30 PM
  - Day 2  8:00 AM–4:30 PM
  - Day 3  8:00 AM–3:00 PM

**PRICE**
- €1,440.00

**NOTE**
- When you book the EATG-1 training course, you will receive free of charge a 12-month single license for the *eEATG* eLearning course!
Sytronix Learning Path

**BASIC TRAINING**

- HTG: Basic Knowledge of Hydraulics
- eHTG: Basic Knowledge of Hydraulics (eLearning)
- e4EE: Basic Knowledge of Energy Efficiency (eLearning)
- eHTG: Sytronix – Hydraulics Training – Pumps

**INTERMEDIATE TRAINING**

- EAT-ID-I: IndraDrive – Diagnostics and Servicing
- Sytronix SvP – Parameterization and Commissioning
- Sytronix FcP – Parameterization and Commissioning
- Hydraulics Training – Pumps
- Sytronix FcP – Diagnostics and Servicing

**SPECIAL TOPICS**

- Sytronix SvP – Diagnostics and Servicing
- Sytronix FcP – Diagnostics and Servicing

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**Sytronix SvP – Parameterization and Commissioning**

This system training transfers knowledge and abilities for design and commissioning of high-performance servo pump drives with a synchronous motor which is operated at an IndraDrive C on the electric side and different hydraulic pumps.

**CONTENTS**

- System Introduction
- Hardware and software overview of the SvP 7020 system
- Handling the connected measurement systems
- System commissioning
- IndraWorks and SvP software functions
- Commissioning the SvP software (MLD project)
- Practical exercises on the training system

**TARGET GROUP**

Planners/application engineers

**DATE (GERMAN/ENGLISH) TRAINING LOCATION**

Dates and training locations available on request

**TRAINING TIME**

- 2 days:
  - Day 1: 10:00 AM – 4:30 PM
  - Day 2: 8:00 AM – 3:00 PM

**PRICE**

€1,020.00

**NOTE**

You can find the current offer online at: www.boschrexroth.com/training

**PREREQUISITES**

- Basic knowledge of hydraulics
- HTTPu pump training
- EAT-ID-I, EAT-ID-Kompakt training courses
- Computer skills
- Technical understanding of electrical engineering and hydraulics concepts

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1) When you book the HTG training course you will receive free of charge a 12-month single license for the eHTG eLearning course!
Sytronix FcP – Diagnostics and Servicing

This system training is intended for all those who want to diagnose, repair or commission a pump system with a frequency-controlled drive. Using exercises, participants will become familiar with the system components and develop an understanding of their functionality.

CONTENTS
- System Introduction
- Hardware and software overview of the FcP 5020/7020 system
- Back-up and restore
- Commissioning the components
- Diagnostics and troubleshooting on the training system

LEARNING OBJECTIVE
- Knowing how to replace components (frequency converter, motor, pump, mechanics and sensors)
- Knowing the features of IndraDrive frequency converters with asynchronous motor
- Knowing how to commission and parameterize
- Knowing the basics of hydraulic fixed and variable displacement pumps
- Knowing about sensors in hydraulic systems
- Knowing how to troubleshoot

PREREQUISITES
- Basic knowledge of hydraulics
- HTPPu pump training
- Computer skills
- Technical understanding of electrical engineering and hydraulics concepts
- Basic knowledge of frequency converters

TARGET GROUP
Service technicians, planners/application engineers

DATE (GERMAN/ENGLISH) TRAINING LOCATION
Dates and training locations available on request

TRAINING TIME
2 days:
Day 1 10:00 AM–4:30 PM
Day 2 8:00 AM–3:00 PM

PRICE
€1,020.00

NOTE
You can find the current offer online at: www.boschrexroth.com/training
**MPC/FTS**

**PLC – IndraWorks/IndraLogic**

**BASIC TRAINING**

- IndraWorks (with IndraLogic 1G = 1st Generation)
  - Basic Knowledge of Electric Control Technology (1G) (eLearning)
    - eESTG-1
  - Basic Knowledge of PLC Technology (2nd Generation)
    - ESTG-SPS-2G

**INTERMEDIATE TRAINING**

- IndraWorks 2G = 2nd Generation
  - Programming with IndraWorks/IndraLogic 2G in Structured Text
    - ESTW/IL 2G-Prog
  - Sequencer Diagnostics 2G
    - ESTW/IL 2G-DC
  - Visualization with WinStudio 2G
    - ESTW/IL 2G-WinStudio

**CONTENTS**

- YM: Module replacement
- User documentation
- Installing/uninstalling software
- FTS for commissioning serial machines
- Replacing sensors and coils
- Troubleshooting and reporting errors

**DATE (GERMAN/ENGLISH) TRAVEL LOCATION**

Dates and training locations available on request

**TRAINING TIME**

2–3 days:
Please contact us for the exact number of days and training times

**PRICE**

€590.00 (per day/participant)

**LEARNING OBJECTIVE**

- Knowing how to service FTS in the field
- Being able to use MPC and FTS to diagnose problems

**PREREQUISITES**

- Basics of Motion Control
- Basics of Software Engineering and C/C++

**TARGET GROUP**

Service technicians

In this practical training course, participants receive information on maintenance and support of FTS components and software at production locations.

1) When you book the ESTG-SPS-1G or ESTG-SPS-2G training course you will receive free of charge a 12-month single license for the eESTG eLearning course!
Visualization with WinStudio 2G

This training course gives an overview of the creation of visualizations using WinStudio. Images and image groups will be created and animated using variables from the control systems. The various drivers for connecting to the control system will be addressed. Participants will learn about the ways to use WinStudio through practical exercises.

CONTENTS
- WinStudio/IndraWorks HMI
- Basic settings
- PLC and MTX interfaces
- Driver sheets
- Managing and creating images
- Image control in WinStudio and IndraWorks Operation
- Creating objects
- Assigning object properties
- Managing and displaying variables
- Recipes, symbols (prototypes)
- Arithmetic sheets, alarm sheets, calendar sheets
- Tables, alarms
- Using script language (WinStudio, WinScript)
- Overview of the command set for script language

PREREQUISITES
Completion of the EST-IW/IL 2G-Prog training course or comparable knowledge

TARGET GROUP
Service technicians, programmers, planners/application engineers

DATE (GERMAN)         TRAINING LOCATION
05/06/2019–05/10/2019  Erbach/Odenwald
10/14/2019–10/18/2019  Erbach/Odenwald

DATE (ENGLISH)         TRAINING LOCATION
07/08/2019–07/12/2019  Erbach/Odenwald

TRAINING TIME
5 days:
Day 1  10:00 AM–4:30 PM
Days 2–4  8:00 AM–4:30 PM
Day 5  8:00 AM–1:00 PM

PRICE
€2,050

LEARNING OBJECTIVE
- Knowing how to assign object properties
- Being able to program actions
- Knowing how to integrate the WinStudio application into IndraWorks Operation
- Being able to create a user-specific visualization
- Being able to utilize the possibilities of WinStudio in HMI applications
## XLC/MLC

### MTX CNC System

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<tr>
<td><strong>EST-MTX-BedProg</strong> Basic NC Programming with Rexroth Standard User Interface</td>
<td><strong>EST-ID-Kompakt</strong> Commissioning and Project Planning of the MTX CNC System with Sercos III and Sercos II</td>
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<td><strong>EST-ID-I</strong> Instruction - Diagnostics and Servicing</td>
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<td><strong>EST-MTX4</strong> Maintaining and Servicing the MTX System with Sercos III</td>
<td><strong>EST-MTX-ID-Proj 2G</strong> Commissioning and Project Planning of the MTX CNC System with Sercos III and Sercos II</td>
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<tr>
<td><strong>ESTG-SPS-2G</strong> Basic Knowledge of PLC Technology (2nd Generation)</td>
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<th>Operators and programmers</th>
<th><strong>EST-MTX-Bed</strong> Operation with Rexroth Standard User Interface</th>
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<td><strong>EST-MTX-Bed</strong> Operation with Rexroth Standard User Interface</td>
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### Optimizing and Increasing Availability

- **EST-MTX-BedProg** Basic NC Programming with Rexroth Standard User Interface
- **EST-MTX-CA** MTX Cycle Time Analyzer
- **EST-MTX-EWB** MTX Efficiency Workbench

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1) When you book the EATG-1 training course you will receive free of charge a 12-month single license for the eEATG eLearning course!

2) When you book the ESTG-SPS-2G training course you will receive free of charge a 12-month single license for the eESTG eLearning course!
MTX Training System

**PRODUCT DESCRIPTION**

This training system is ideal for getting acquainted with NC technology and for imparting practical knowledge in the field of NC technology and machine tools using components used in the industrial sector.

Module 1 consists of HMI (IndraControl VEP) and machine control panel (IndraControl VAM 15.1).

Module 2 supplements the training system with the axis model, including three axes with the following components:
- Electric drives (IndraDrive Cs)
- Motors (IndraDyn MS2N)
- MTX performance L 75 NC control

With this training system the project planning, commissioning, operation, programming and maintenance can be explained clearly.

Replacing the MTX firmware with the MLC firmware makes the training system suitable for MLC applications such as Robot Control.

Connection to Schuko safety sockets (AC230V ± 10%, 16A, 50-60 Hz)

Operation with an Fi circuit breaker, however, is not possible!

- Are you interested in our training systems?
  - Please contact us, we would be happy to advise you.

Rexroth part no. R911342540 Complete device

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**Motion Logic (Drive-Based) – MLD Learning Path**

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**BASIC TRAINING**

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<td>Programming with IndraWorks/IndraLogic 2G</td>
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<td>EST-ID-MLDG/MLDM 2G-Prog</td>
<td>Programming with IndraLogic MLD-S and MLD-M 2G</td>
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<tr>
<td>EAT-ID-Keepakt</td>
<td>IndraDrive with Multi-Ethernet Interface</td>
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1) When you book the ESTG-SPS-1G or ESTG-SPS-2G training course you will receive free of charge a 12-month single license for the eESTG Learning course.