ABB

Training Center Robotics
Training for ABB robots and application engineering

Competitive advantages
by qualified trainers

Our extensive training program allows you to prepare and specialize your staff optimally for the use of ABB robots. This allows you to operate your systems efficiently and optimally.
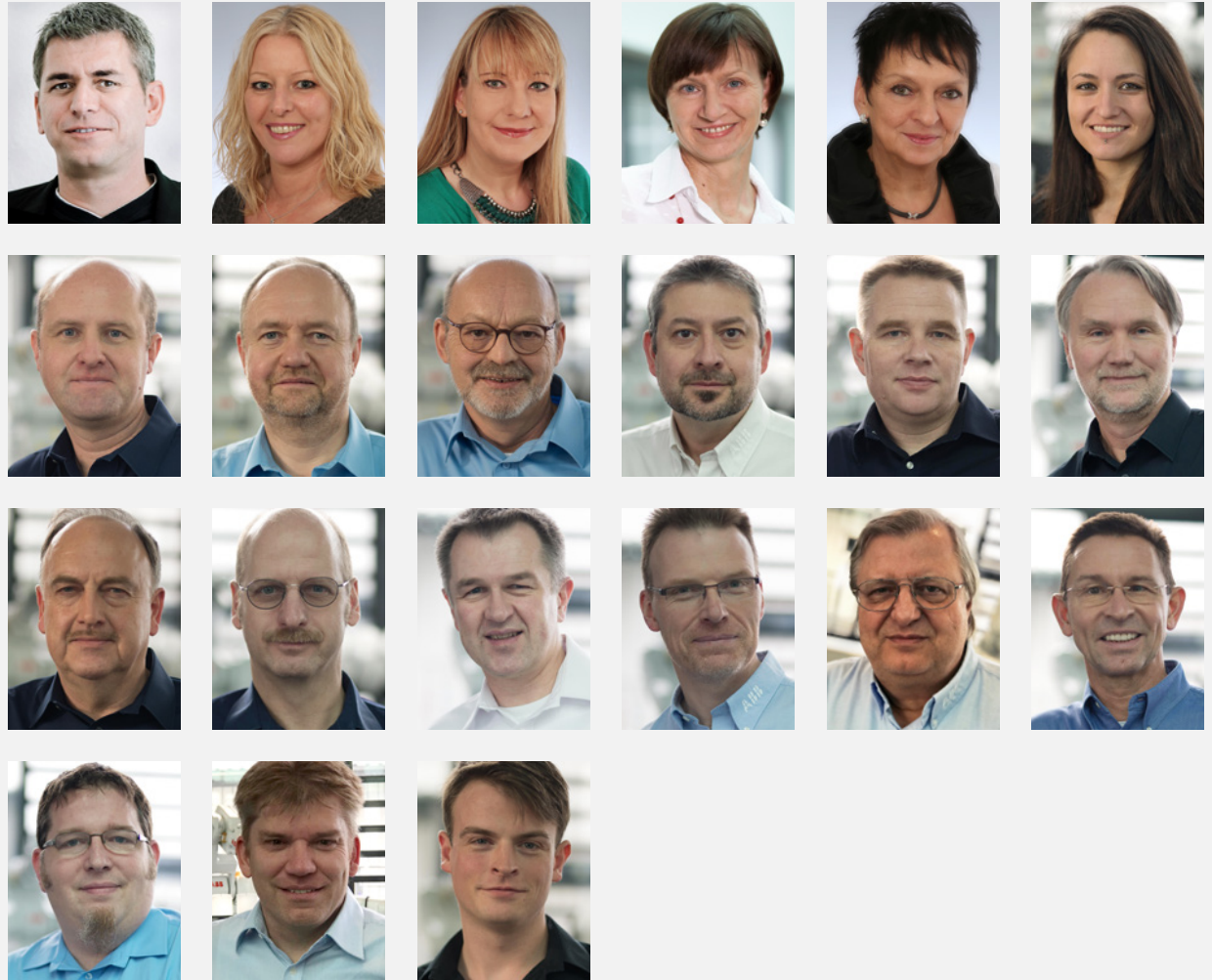
Our basic courses form the foundation and therefore the important basis for all user groups. The knowledge gained can be expanded according to needs and requirements with our in-depth courses and be solidified.

The subject of security also has a firm place in our offer. We train you extensively on all relevant safety aspects of robotic technology.

In addition to the standard courses, we also offer individual Training opportunities tailored to your needs to. These can also be done on-site with our mobile training systems.

We are happy to provide you with individual advice and wish you a lot of fun with our current Training program.

Frank Wiesel, Head of Training Center
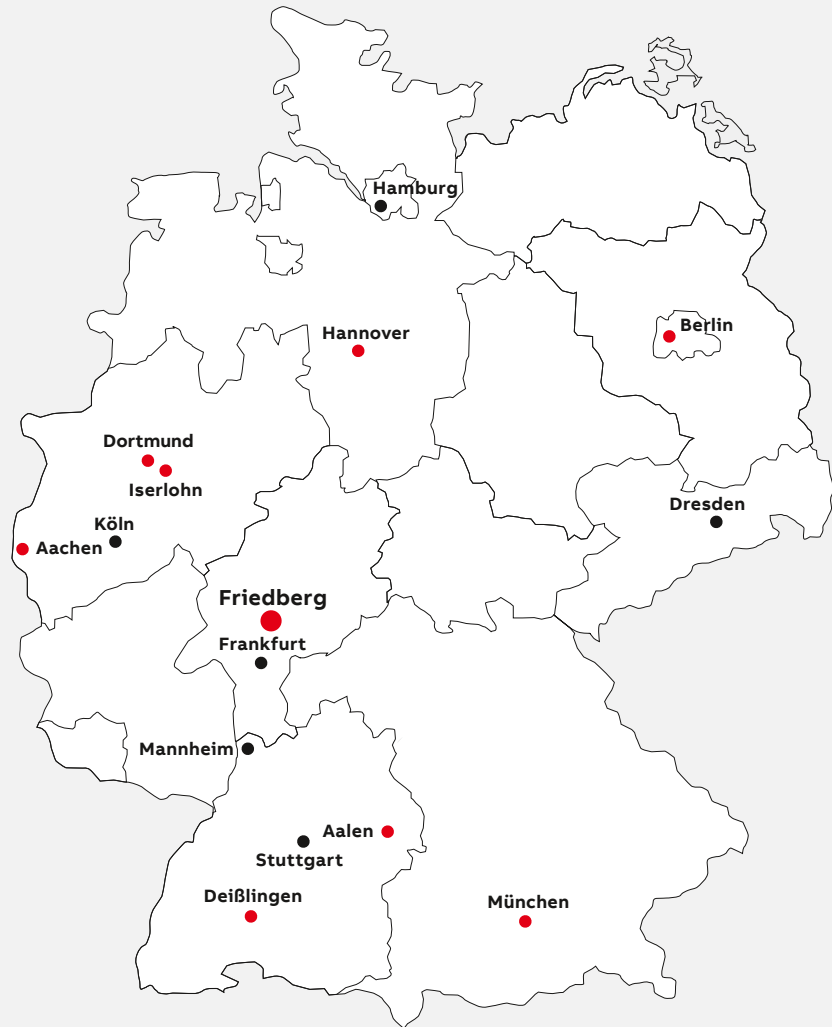
ABB

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Customer Service
Training

Overview:
- High qualified, seasoned trainers
- Over 70 norm training programs for products and systems
- Individual on customer needs tailored training
- On-site training on demand with mobile robots
- 12 training rooms with more than 30 robots in Friedberg
- Next to our headquarters in Friedberg, seven other external training locations in Aalen, Aachen, Berlin, Dortmund, Dreißlingen, Iserlohn, Hannover and München
- Course documentation in german and english

Further information and schedule agreements:

ABB Automation GmbH
Business Line Robotics
Training Center
Grüner Weg 6
61169 Friedberg, Germany
Phone: +49 60 31 85-233
Fax: +49 60 31 85-422
E-Mail: roboterservice.schulung@de.abb.com

www.abb.de/robotics

Hamburg

Hannover

Berlin

Dortmund

Iserlohn

Dresden

Köln

Aachen

Friedberg

Frankfurt

Mannheim

Aalen

Stuttgart

Deißlingen

München

● ABB Robotics training locations

Customer Service
Training

In addition to updating some course content, we have added the following courses for you to our catalog:

- **Programming 1 Express**
  We have responded to your suggestions and are pleased to offer you the PG1 as a 4-day course. Course content and time span correspond to the well-known PG1 course.

- **New training program: IRC5 safety specialist**
  With this new training concept, we have all the relevant training courses that you need to become a safety specialist. The completion of the training is the certification to the safety commissioning engineer.

- **New course: MRK**
  In this course, we offer you an insight into machine safety with a focus on MRK applications. The integrators and manufacturers of MRK systemslearn to implement the relevant regulations, technical specifications and standards. For operators of MRK systems, these serve asInformation source to create risk assessments.

For detailed information about a training plan, click on it.
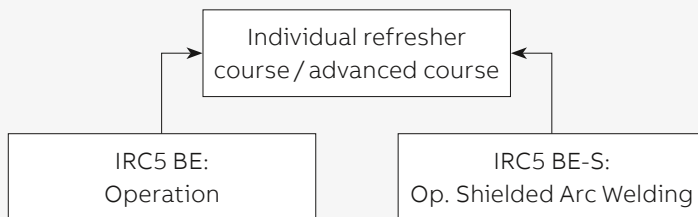
Overview

Industrial robot IRC5
Plant operator training plan

For detailed information about a course module, click on it.

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            ┌─────────────────────────┐
        ┌──▶│  Individual refresher   │◀──┐
        │   │ course / advanced course│   │
        │   └─────────────────────────┘   │
        │                                 │
┌───────┴────────┐            ┌───────────┴─────────────┐
│  IRC5 BE:      │            │   IRC5 BE-S:            │
│  Operation     │            │ Op. Shielded Arc Welding│
└────────────────┘            └─────────────────────────┘
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IRC5 BE: Operation

Target group
Plant operators, mechanical service personnel, application engineers

Course goals
- Independent execution of operating functions
- Switching on and starting up the robot system
- Moving the mechanics with a joystick
- Loading, testing and optimising simple movement programs
- Recognising and rectifying simple faults and service interruptions (e.g. emergency stop)

Contents
- Occupational health and safety
- Structure and function of the robot system
- Types of movement in manual and automatic operation
- Monitoring input and output signals
- Loading and saving modules and programs
- Error messages and status report

Prerequisites
None

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,380 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 BE: Operation**
2. Individual refresher course / advanced course

IRC5 BE-S: Operation Shielded Arc Welding

Target group
Plant operators, mechanical service personnel,
application engineers

Course goals
- Switching on and starting up the robot system
- Moving the mechanics with a joystick
- Loading, testing and optimising simple movement programs
- Recognising and rectifying simple faults and service interruptions
  (e.g.emergency stop)
- Making weld seams

Contents
- Occupational health and safety, robots and application
- Structure and function of the robot system
- Types of movement in manual and automatic operation
- Monitoring input and output signals
- Backup
- Error messages and status report
- Getting to know and applying application related instructions
  and software commands
- Programming weld seams with predefined welding data
- Correcting weld seams

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5 BE-S: Operation Shielded Arc Welding**
2. Individual refresher course / advanced course

Industrial robot IRC5
Plant manager training plan

For detailed information about a course module, click on it.

	Individual refresher course / advanced course

	Safety

	IRC5 PS-RS1: RobotStudio 1

	Special programming as required

	Application engineering courses as required

	IRC5 PS-A: Plant operation

IRC5 PG1: Programming basics 1	IRC5 Change-over Workshop: S4C+ Upgrade	IRC5 YuMi1: YuMi basics

IRC5 PG1: Programming basics 1

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Performing handling tasks
- Programming robot movements and controlling the gripper

Prerequisites
Computer skills

Information
Course duration: 5 or 4 days (Express)
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,170 EUR / participant

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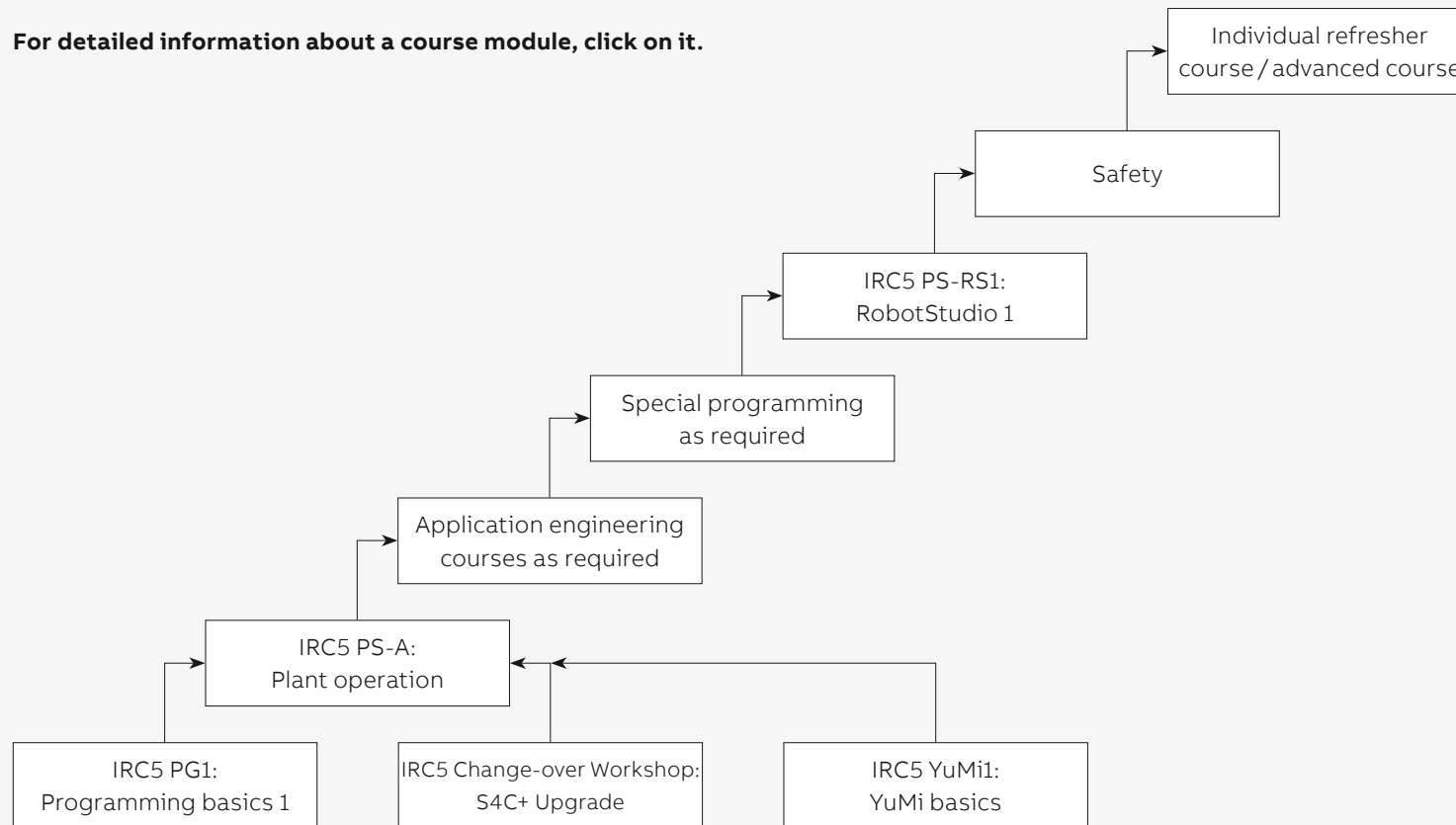roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5 PG1: Programming basics 1**
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 Change-over Workshop: S4C+ Upgrade

Target group
Programmers, commisioning engineers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Refresher course and transfer to IRC5
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Performing handling tasks
- Programming robot movements and controlling the gripper

Prerequisites
- Basic programming courses S4C / S4C+ PG1, as well as the knowledge acquired therein.
- Computer skills

Information
Course duration: 3.5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,910 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 Change-over Workshop: S4C+ Upgrade**
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 YuMi1: YuMi basics

Target Group
Programmers, commisioning engineers, plant managers, project managers, planners, maintenance technicians electrics, exclusively for those who use the YuMi robot system. An alternative method to achieve the same result would be to take part in the standard course IRC5 PG1, followed by the extension course IRC5 PS-YuMi

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimising and the documentation of simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant, RobotStudio, RobotStudio App
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status reports
- Backup
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 YuMi1: YuMi basics**
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-A: Plant operation

Target group
Plant managers who configure, adapt or optimize programmes in existing systems

Course goals
- Understand programme execution, functionality and RAPID solution
- Measure cycle time and motion as well as optimize I/O monitoring
- Configure the system in RobotStudio in order to conduct offline tests and optimisation

Contents
- Occupational health and safety
- Backup
- RobotStudio used with own applications
- Increasing programming knowledge (RAPID declaration)
- Functional monitoring: robots and coordinate systems
- Basics of motion optimisation: measure cycle time, ergonomic movement type and setting
- Motion and I/O control: Save cycle time with triggering
- Configurations: examples of parameter adjustments
- Programme structure: modularity, local declarations, model management

Prerequisites
- Participation in the PG1 basic course for the respective control generation
- Computer skills
- If possible, bring your own computer and your own system backup

Information
Course duration: 4 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **IRC5 PS-A: Plant operation**
3. Application engineering courses as required
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

APT-IDFPS-B: Sealing Basics

Target group
Programmers, plant operators, project managers, planners, commissioning engineers, maintenance technicians who work in the field of sealing and seam sealing.

Course goals
- Using the IDFP system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Independently developing, implementing, testing, optimising and documenting simple application programs
- Making changes/optimisations to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related data types, instructions and software commands
- Programming adhesive seams
- Evaluating and optimising seam results
- Architecture of the "IntegratedProzessSystem"
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Backup and diagnosis

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. **Application engineering courses as required**
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 APT-P: Spot welding

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- This application gives you the skills you need to safely move the IRB with integrated spot welding tongs
- Setting up spot welding tongs on the IRB
- Teaching basic skills on the structure and process in a spot welding plant
- Recognising and optimising problematic processes
- Changing and / or optimising the application

Contents
- Occupational health and safety in dealing with the application
- Mechanical and electrical structure of the application
- Teaching the application software SpotWare
- Connecting the welding controls to the controls of the robot system
- Getting to know and applying application related instructions and software commands
- Getting to know and applying application related data types
- Adjusting application related system parameters
- Tong measurement
- Writing and testing application program

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 2 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,480 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. **Application engineering courses as required**
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 APT-RB: Roller beading

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- This application gives you the skills you need to safely move the IRB with integrated roller beading tool
- Setting up a roll beading tool on the IRB
- Teaching basic skills on the structure and process in a roll beading application
- Recognising and optimising problematic processes
- Changing and / or optimising the application

Contents
- Occupational health and safety in dealing with the application
- Mechanical and electrical structure of the application
- How the system works
- Adjusting application related system parameters
- Getting to know and applying application related instructions and software commands
- Discussing RH system modules
- Performing RH calibration
- Writing and testing application program

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. **Application engineering courses as required**
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 APT-S1: Shielded arc welding 1

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- Making changes to the application
- Making weld seams

Contents
- Occupational health and safety in dealing with the application
- Teaching the application software ArcWare
- Using the ABB-Production-Manager
- Getting to know and applying application related instructions and software commands
- Programming weld seams with predefined welding data
- Correcting weld seams

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. **Application engineering courses as required**
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 APT-S2: Shielded arc welding 2

Target group
Programmers, commissioning engineers, plant operators, application technicians

Course goals
• The independent programming of a welding plant
• Making changes/optimisations to the application

Contents
• Occupational health and safety in dealing with the application
• Safety with robot welding plants
• Occupational health and safety of inert gas welding
• Adjusting application related system parameters
• Systematic structure of a welding program with observation of the programming guidelines
• Definition of seam, pendulum and welding data
• Programming weld seams
• Programming with external axes
• Troubleshooting the welding program
• Error diagnostics in the welding program
• Automatic TCP measurement and monitoring
• Basics of the different types of arcs
• Welding with different material strengths
• Documenting the welding routines

Prerequisites
• Participation in the application course on arc welding 1
• Arc welding skills
• Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. **Application engineering courses as required**
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-C: Conveyor tracking

Target group
Project managers, programmers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Connecting material handling technology to the robot system
- The programming of manufacturing processes with material handling synchronisation
- Individual course goals can be agreed together with the participants

Contents
- Occupational health and safety
- Installation of the additional hardware components such as encoder module, encoder and start signal system
- Determining the corresponding parameters
- Functional testing
- Programming the material handling synchronisation

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-EE: Energy Efficiency

Target group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Utilisation of the energy saving features incorporated in RobotStudio
- Reducing energy consumption and wear
- Achieve gains in productivity

Contents
- Occupational health and safety
- Monitoring energy, temperature and performance at the robot as well as in the virtual system
- Data analysis and processing
- Motion optimisation: paths, velocities, acceleration
- Analysis of waiting time in a program
- Energy related RAPID-commands and system parameters

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 2.5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-FCM: Force Control for Machining

Target group
Planners, commissioning engineers, programmers

Course goals
- Understanding and setting up the Force Control for Machining option
- Getting to know the functionality of the force-controlled process regulation on the machined part
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- Producing a system with the Force Control for Machining option with the help of the Graphical User Interface (GUI)
- Getting to know and using the graphical user interface
- Aligning the machined part with the force-controlled process regulation
- Getting to know and applying application relating instructions and functions
- Programming the application processes – force-controlled process and speed-controlled process
- Assembly basics

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-M: Multitasking

Target group
Project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
• Getting to know and programming the functionality of controls when applying the option of Multitasking

Contents
• Occupational health and safety
• Functioning of the controls in Multitasking
• Storage structure and structure of system parameters
• Programming and integrating background tasks
• Synchronisation of a foreground and background task
• Using joint data elements
• Using interrupt programming
• Sequence chains and dispatcher programming
• Creating a background task with different priorities
• Proposed solutions

Prerequisites
• Basic course PG1
• Computer skills

Information
Course duration: 4 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-MIG: Migration

Target group
Commisioning engineers, programmers, service personnel

Course goals
- In the course Migration, the procedure for the migration of a production system from S4C+ to IRC5 is carried out using the relevant equipment
- Participants make use of RobotStudio to a large extent
- Installation of RobotStudio on own PC

Contents
- Occupational Safety
- Data backup (manual)
- System building in RobotStudio
- Comparison of old and new parameter structure
- Preparation of data for porting
- Hints for the selection of new mechanics
- Testing and optimizing new equipment

Prerequisites
- Basic course IRC5 PG1
- Computer skills
- Please supply your own PC with admin rights

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-MMV: MultiMove

Target group
Commisioning engineers, programmers, plant manager, maintenance technicians electrics, project managers, planners

Course goals
- Understanding MultiMove
- Commissioning and programming MultiMove systems
- Measuring and monitoring the associated coordinate systems
- Writing movement programs (independent, synchronous, coordinated)
- Mastering Special MMV declarations and instructions

Contents
- Occupational health and safety
- Structure of the hardware
- Creating a system with MultiMove
- Calibration of monitoring systems
- Getting to know measurement methods for tool / work object and basic coordinates (Applying measurement routines)
- Testing the coordination of movement
- System parameters and backup
- Loading, editing, starting up and saving tasks
- Programming of independent, synchronized and coordinated movements
- Controlling movement tasks with additional management tasks

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant
Notes: Exercises on robots are performed on the systems and types of robots that are available at the Training Center for Robots

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-PM: PickMaster 3 basics

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Carrying out the electrical and mechanical commissioning of the robot system
- Knowing the basic functions of PickMaster
- Connecting material handling technology to the robot system
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- System structure
- Installation of the PickMaster software
- Structure and wiring of a PickMaster system
- Structure of the robot programs
- Defining lines and projects
- Calibrating the camera
- Calibrating material handling technology
- PLC connection
- Backing up the whole system

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons per company
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-PN: ProfiNet

Target group
Commisioning engineers, service personnel, programmers

Course goals
- Logging I/O Unit onto ProfiNet Bus System via IRC5 serial interface
- Configuration of the serial interface
- Dealing with faults

Contents
- ProfiNet Basics
- Creating ProfiNet Topology
- ProfiSafe
- Configuration of the serial interface
- Creating and managing a new project
  (saving, compiling, loading, testing and archiving)
- Analysing and rectifying faults
- Component replacement

Prerequisites
- IRC5 PG2 or IRC5 SE or IRC5 PS-I
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-RS-AWPP: RobotStudio ArcWelding PowerPac

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Offline programming of arc welding programs using RobotStudio
- Taking into account collision detection and arm configuration
- Program / process optimization
- Implementation on actual welding equipment

Contents
- Building an ArcWelding PowerPac
- Interacting with an AW-PP interface
- Importing geometry
- Library function
- Creation of robot positions relative to geometry
- Create a welding system
- Programming welding seams offline
- Create welding parameter templates
- Synchronizing sequences with a virtual machine, thus creating a Rapid structure
- Loading the program into a real welding cell and correcting positions

Prerequisites
- IRC5 APT-S1 Inert gas welding
- IRC5 PS-RS RobotStudio
- Please supply your own PC with admin rights

Information
Course duration: 3 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. Special programming as required
5. **IRC5 PS-RS1: RobotStudio 1**
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-RS-Online: RobotStudio Online

Target Group
Commisioning engineers, plant managers, maintenance and service personnel

Course goals
- Use RobotStudio in practice with the robot controller
- This course does not cover CAD programming in RobotStudio

Contents
- Creation and modification of systems, as well as booting systems
- Networking, design and online communication with RobotStudio
- Creating so-called "relationships" between the robot controller and virtual systems (transmission and comparison of data elements)
- I/O configuration
- Creation of virtual duplicates, program editor
- Online tools, "Job" creation
- Online signal analysis

Prerequisites
- Basic course PG1 of the respective controller generation
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,910 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-RWMT: RobotWare Machine Tending

Target group
Programmers, commisioning engineers, plant managers,
Electrical equipment service personnel,
employees of companies with material handling robots

Course goals
- Integration of RobotWare Machine Tending in an
  automated material handling system

Contents
- Configuration of the User-Interface
- Homepos Running
- Knowledge of datatypes, instructions / functions
- Programming guidelines
- Event handling
- Operation and remote control with signal interface
- RobotWare Machine Tending Powerpack

Prerequisites
- Basic course PG1
- Knowledge of working with RobotStudio
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-S+EPS: SafeMove and EPS

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Connecting an initiator
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMove application
- Help routines for supporting SafeMove
- Using the TestSignalViewer to integrate external axes
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-SP: SafeMovePro

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Working with Pre- and Postlogic
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMovePro application with visual SafeMove
- Help routines for validation SafeMove
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course IRC5 PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

Certification safety commissioning engineer

The technical rules for operational safety (TRBS) indicate the state of the Engineering, occupational medicine and hygiene, as well as other scientific findings for the provision and use of work equipment and for the operation of equipment in need of monitoring.

These TRBS concretized the scope and the conditions of the industrial safety regulation. In compliance with the technical rules can the employer assume that the corresponding Requirements of the Regulation are met. If the employer choose another solution then he have to reach the same safety and the same health protection.

Contents
- Final exam for all courses of the training series (IRC5 PG1, IRC5 PS-S, IRC5 Machine Safety, IRC5 PS-S-Adm)
- Award of certificates and IDs IRC5

Note
If the qualified person has not taken any exams for a longer period of time, you must refresh experiences by participating in third party exams and renew their professional knowledge. The technical knowledge is to renew every 5 years.

Prerequisites
- Basic course IRC5 PG1 or IRC5 YuMi 1 and IRC5 PS-Safe Move or SaveMovePro and IRC5 Machine Safety and IRC5 PS-S-Adm SafeMove Administrator
- Computer skills

Information
Course duration: 1 hour
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 250 EUR

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-X1: Programming external axes

Target group
Planners, project managers, commissioning engineers, programmers, maintenance technician electrics

Course goals
- Getting to know the control functions
- Using external axes in the robot system
- Moving the robot or the work object using coordinated external axes

Contents
- Occupational health and safety
- Programming with an axis that rotates a device
- Programming uncoordinated linear and rotating axes
- Programming coordinated linear and rotating axes
- Programming dependent axes
- Programming independent axes
- Programming a robot on a process axis
- Measuring coordinate systems and moved work objects

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-X2: Configuring external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Dimensioning hardware components
- Installing additional axes
- Configure the software
- Check the operation of all components

Contents
- Occupational safety
- Schematics, connection variants
- Rectifiers, driver stages, motor units for external axes
- Compile configuration according to specifications
- Select / create open configuration
- Use encrypted configuration
- Handling aids
- Function check and troubleshooting

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-X3: Trimming external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
• Control intervention and getting to know additional axes
• Optimized control
• Evaluation of the quality of control in relation to the automation task

Contents
• Occupational health and safety
• Fine-tuning servo control by recording the control response
• Utilizing TuneMaster
• Displaying and recording control signals

Prerequisites
• IRC5 PS-X2: Configuring external axes
• Electrical expertise
• Computer skills

Information
Course duration: 2.5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-YuMi

Target Group
Programmers, commisioning engineers, plant managers, project managers, planners and maintenance technicians electrics with experience of IRC5 who want to use the YuMi robot system.

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimizing and the documentation of simple movement programs
- Basic knowledge of IRC5 is a prerequisite

Contents
- Occupational health and safety
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
- IRC5 PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. **Special programming as required**
5. IRC5 PS-RS1: RobotStudio 1
6. Safety
7. Individual refresher course / advanced course

IRC5 PS-RS1: RobotStudio 1

Target Group
- Planners, commissioning engineers, programmers, plant managers and project managers

Course goals
- Visualising and creating complex tasks for robot control systems using the RobotStudio offline tool
- Programming without direct intervention in the robot (offline)

Contents
- Occupational health and safety, installation and licensing issues
- Work surface functions
- Data management and project related structures in RobotStudio
- Integration of geometric data, CAD data formats
- Possibilities for creation of systems and units
- Design of the robot work environment in RobotStudio
- Creation and editing graphic components
- Base frame systems in RobotStudio
- Creation and measurement of tools and work objects
- Bringing movement to graphic objects
- Creating positions and paths
- Check accessibility of positions
- Automatic path generation on curved bodies
- Synchronizing data between the unit and the virtual system
- Integration of the program editor
- Possibilities for simulation, cycle times, collision check and signal analysis
- Recording applications
- Incorporating external axes
- Programming a MultiMove station
- Replication and practical testing on a robot training unit

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. Special programming as required
5. **IRC5 PS-RS1: RobotStudio 1**
6. Safety
7. Individual refresher course / advanced course

IRC5 Machine Safety

Target group
Plant managers, maintenance personnel, safety officials, designers, planners

Course goals
Insight into Machine Safety requirements of robotic workstations

Contents
- Overview and classification
- In context: Machinery Directives 2006/42/EC – Product Safety Act
- Insight into: Machinery Directives 2006/42/EC, 1st Appendix
  a) Basic health and safety requirements
  b) Explanation: Machinery – incomplete machinery
  c) EC – Declaration of Conformity – Installation Instructions
  d) Commissioning and start-up of a machine
  e) Applying directives and harmonized standards
  f) Approach to risk assessment
  g) Risk appraisal
  h) Risk evaluation
- MRK with conventional robot systems
- Case Study: Robot safety of the latest generation

Prerequisites
Computer skills

Information
Course duration: 4 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. **Safety**
7. Individual refresher course / advanced course

IRC5 MRK: Human-Robot-Collaboration

Target group
Planner, construction engineers, programmers, commissioning engineers, project managers and safety experts

Course goals
Insight into machine safety with the focus on MRK applications

Contents
- Definition and rules on the subject of MRK (DIN 101218-1 and-2 and ISO/TS15066)
- Carrying out risk assessments according to DIN 12100
- Carrying out pressure and force measurements
- Verification and validation of security functions according to DIN 13849-1 and 2
- Define the 4 protection principles:
  1. Safety-related monitored standstill;
  2. Manual guidance;
  3. Speed and distance monitoring;
  4. Power and force limitation
- Performance and force measurement with YuMi
- Carrying out force measurements
- Calculation example of a safety function
- Validation

Prerequisites
Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,070 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. **Safety**
7. Individual refresher course / advanced course

IRC5 PS-S-Adm: SafeMove Administrator

Target group
Programmers, commisioning engineers, plant managers and service personnel, responsible for programming with SafeMove

Course goals
- Testing and acceptance of SafeMove programming
- Access concept and documentation

Contents
- Occupational health and safety
- Over-run principle
- Simulation in RobotStudio
- Testing on a robot
- Managing access rights
- Documentation of the complete safety concept
- Final examination for all courses of the training series: (IRC5 PG1, IRC5 PS-S, IRC5 MS, IRC5 PS-S-Adm)
- Presentation of certificates and permits

Prerequisites
IRC5 PS-S SafeMove or IRC5 PS-SP SafeMove Pro and IRC5 Machine Safety

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-A: Plant operation
3. Application engineering courses as required
4. Special programming as required
5. IRC5 PS-RS1: RobotStudio 1
6. **Safety**
7. Individual refresher course / advanced course

Industrial robot IRC5
Programmer training plan

For detailed information about a course module, click on it.

Individual refresher course / advanced course

IRC5 PG3: Programming basics 3

IRC5 PS-RS2: RobotStudio 2

IRC5 PG2: Programming basics 2

Safety

Special programming as required

IRC5 PS-RS1: RobotStudio 1

Application engineering courses as required

IRC5 YuMi2: YuMi advanced

IRC5 PG1: Programming basics 1

IRC5 Upgrade Workshop: S4C+ Upgrade

IRC5 Upgrade Workshop: Robot specialists

IRC5YuMi1: YuMi basics

IRC5 PG1: Programming basics 1

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Performing handling tasks
- Programming robot movements and controlling the gripper

Prerequisites
Computer skills

Information
Course duration: 5 or 4 days (Express)
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,170 EUR / participant

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**QUOTATION
VIA EMAIL**

Overview of training plan
1. **IRC5 PG1: Programming basics 1**
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 Change-over Workshop: S4C+ Upgrade

Target group
Programmers, commisioning engineers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Refresher course and transfer to IRC5
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Performing handling tasks
- Programming robot movements and controlling the gripper

Prerequisites
- Basic programming courses S4C / S4C+ PG1, as well as the knowledge acquired therein.
- Computer skills

Information
Course duration: 3.5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,910 EUR / participant

Contact
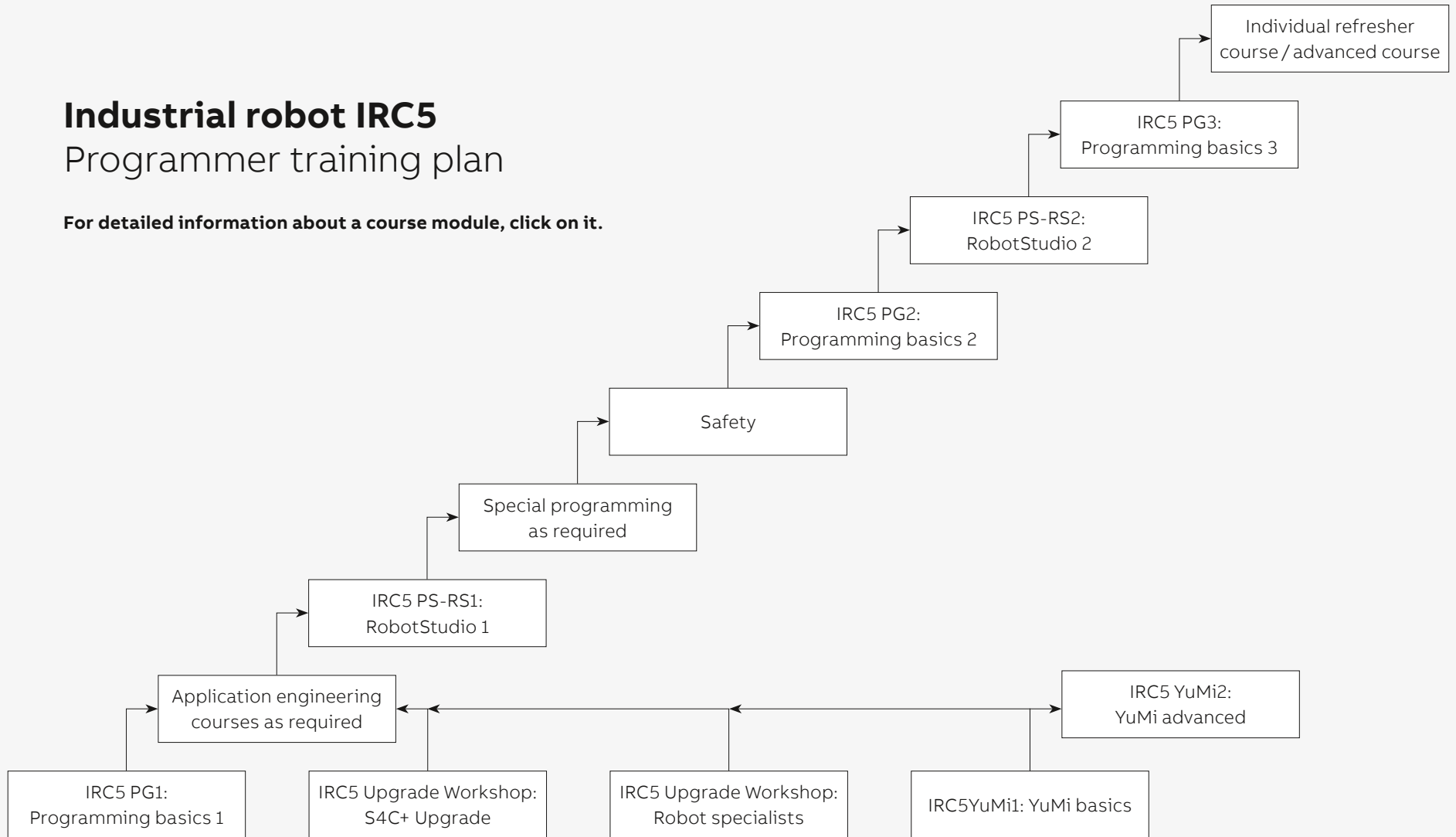Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 Change-over Workshop: S4C+ Upgrade**
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 Upgrade Workshop: Robot specialists

Target group
- Robot specialists

Course goals
- Advanced programming skills
- Gaining the prerequisites to attend IRC5 PG3

Contents
- Occupational health and safety
- Main topics from basic courses IRC5 PG1 and PG2
- Prioritization of topics at the start of training
- Perform contents individually
- Consideration and deeper examination of know issues in-and-around IRC5

Prerequisites
- Robot controller expert
- Several years of experience in robotic installation, commissioning and programming
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–4 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5 Upgrade Workshop: Robot specialists**
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG3: Programming basics 3
7. Individual refresher course / advanced course

IRC5 YuMi1: YuMi basics

Target Group
Programmers, commisioning engineers, plant managers, project managers, planners, maintenance technicians electrics, exclusively for those who use the YuMi robot system. An alternative method to achieve the same result would be to take part in the standard course IRC5 PG1, followed by the extension course IRC5 PS-YuMi

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimising and the documentation of simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant, RobotStudio, RobotStudio App
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status reports
- Backup
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3 – 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 YuMi1: YuMi basics**
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 YuMi2: YuMi advanced

Target Group

Programmers, commissioning engineers, system operators, maintenance technician electrics

Course goals

- Commissioning and programming of YuMi robotic systems
- Use of IntegratedVision as well as interfaces to external sensors

Contents

- Occupational health and safety
- Commissioning and deepening of programming
- MultiMove application for synchronized movements
- Use IntegratedVision for part detection
- Interfaces for external sensors

Prerequisites

IRC5 YuMi1 basics or IRC5 PG1 with IRC5 PS-YuMi

Information

Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,390 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan

1. **IRC5 Yumi2: YuMi advanced**
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

APT-IDFPS-B: Sealing Basics

Target group
Programmers, plant operators, project managers, planners, commissioning engineers, maintenance technicians who work in the field of sealing and seam sealing.

Course goals
- Using the IDFP system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Independently developing, implementing, testing, optimising and documenting simple application programs
- Making changes/optimisations to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related data types, instructions and software commands
- Programming adhesive seams
- Evaluating and optimising seam results
- Architecture of the "IntegratedProzessSystem"
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Backup and diagnosis

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 APT-P: Spot welding

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- This application gives you the skills you need to safely move the IRB with integrated spot welding tongs
- Setting up spot welding tongs on the IRB
- Teaching basic skills on the structure and process in a spot welding plant
- Recognising and optimising problematic processes
- Changing and / or optimising the application

Contents
- Occupational health and safety in dealing with the application
- Mechanical and electrical structure of the application
- Teaching the application software SpotWare
- Connecting the welding controls to the controls of the robot system
- Getting to know and applying application related instructions and software commands
- Getting to know and applying application related data types
- Adjusting application related system parameters
- Tong measurement
- Writing and testing application program

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 2 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,480 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 APT-RB: Roller beading

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- This application gives you the skills you need to safely move the IRB with integrated roller beading tool
- Setting up a roll beading tool on the IRB
- Teaching basic skills on the structure and process in a roll beading application
- Recognising and optimising problematic processes
- Changing and / or optimising the application

Contents
- Occupational health and safety in dealing with the application
- Mechanical and electrical structure of the application
- How the system works
- Adjusting application related system parameters
- Getting to know and applying application related instructions and software commands
- Discussing RH system modules
- Performing RH calibration
- Writing and testing application program

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 APT-S1: Shielded arc welding 1

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- Making changes to the application
- Making weld seams

Contents
- Occupational health and safety in dealing with the application
- Teaching the application software ArcWare
- Using the ABB-Production-Manager
- Getting to know and applying application related instructions and software commands
- Programming weld seams with predefined welding data
- Correcting weld seams

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 APT-S2: Shielded arc welding 2

Target group
Programmers, commissioning engineers, plant operators, application technicians

Course goals
- The independent programming of a welding plant
- Making changes/optimisations to the application

Contents
- Occupational health and safety in dealing with the application
- Safety with robot welding plants
- Occupational health and safety of inert gas welding
- Adjusting application related system parameters
- Systematic structure of a welding program with observation of the programming guidelines
- Definition of seam, pendulum and welding data
- Programming weld seams
- Programming with external axes
- Troubleshooting the welding program
- Error diagnostics in the welding program
- Automatic TCP measurement and monitoring
- Basics of the different types of arcs
- Welding with different material strengths
- Documenting the welding routines

Prerequisites
- Participation in the application course on arc welding 1
- Arc welding skills
- Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-RS1: RobotStudio 1

Target Group
- Planners, commissioning engineers, programmers, plant managers and project managers

Course goals
- Visualising and creating complex tasks for robot control systems using the RobotStudio offline tool
- Programming without direct intervention in the robot (offline)

Contents
- Occupational health and safety, installation and licensing issues
- Work surface functions
- Data management and project related structures in RobotStudio
- Integration of geometric data, CAD data formats
- Possibilities for creation of systems and units
- Design of the robot work environment in RobotStudio
- Creation and editing graphic components
- Base frame systems in RobotStudio
- Creation and measurement of tools and work objects
- Bringing movement to graphic objects
- Creating positions and paths
- Check accessibility of positions
- Automatic path generation on curved bodies
- Synchronizing data between the unit and the virtual system
- Integration of the program editor
- Possibilities for simulation, cycle times, collision check and signal analysis
- Recording applications
- Incorporating external axes
- Programming a MultiMove station
- Replication and practical testing on a robot training unit

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **IRC5 PS-RS1: RobotStudio 1**
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-C: Conveyor tracking

Target group
Project managers, programmers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Connecting material handling technology to the robot system
- The programming of manufacturing processes with material handling synchronisation
- Individual course goals can be agreed together with the participants

Contents
- Occupational health and safety
- Installation of the additional hardware components such as encoder module, encoder and start signal system
- Determining the corresponding parameters
- Functional testing
- Programming the material handling synchronisation

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-EE: Energy Efficiency

Target group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Utilisation of the energy saving features incorporated in RobotStudio
- Reducing energy consumption and wear
- Achieve gains in productivity

Contents
- Occupational health and safety
- Monitoring energy, temperature and performance at the robot as well as in the virtual system
- Data analysis and processing
- Motion optimisation: paths, velocities, acceleration
- Analysis of waiting time in a program
- Energy related RAPID-commands and system parameters

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 2.5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-FCM: Force Control for Machining

Target group
Planners, commissioning engineers, programmers

Course goals
- Understanding and setting up the Force Control for Machining option
- Getting to know the functionality of the force-controlled process regulation on the machined part
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- Producing a system with the Force Control for Machining option with the help of the Graphical User Interface (GUI)
- Getting to know and using the graphical user interface
- Aligning the machined part with the force-controlled process regulation
- Getting to know and applying application relating instructions and functions
- Programming the application processes – force-controlled process and speed-controlled process
- Assembly basics

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-I: Initiation

Target group
Commisioning engineers, programmers

Course goals
- For course IRC5 PS-I (Commissioning), tips will be provided for building a new system and the operating system for the controls will be installed
- The participant will use RobotStudio (online functionality) more
- Topics that are only briefly addressed in the course (e.g. system parameters) are independently practised by the participants with the help of the documentation
- Installation of the robot software on the participant's own computer

 Contents
- Occupational health and safety
- Explaining programming regulations in accordance with ABB standards
- Programming branches and loops
- System parameters: Meaning, change, backup
- Circuit diagrams (security and I / O signals)
- Producing a system, installation of the control software
- Converting process descriptions into functional solutions

Prerequisites
- Basic course PG1
- Computer skills
- Please supply your own PC with admin rights
- Electrical expert

Information
Course duration: 5 days
Number of participants: 3 – 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-IV: Integrated Vision

Target group
Planners, commissioning engineers, programmers, maintenance personnel

Course goals
Mechanical and electrical integration of camera systems

 Contents
- System Overview
- Installation and Setup
- RobotStudio and FlexPendant user interface
- Camera configuration and calibration
- Vision tools and RAPID instructions
- Functions and data types

Prerequisites
- Participation in the course on Programming basics 2 or the IRC5 Upgrade workshop
- Computer skills

Information
Course duration: 4 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-M: Multitasking

Target group
Project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
• Getting to know and programming the functionality of controls when applying the option of Multitasking

Contents
• Occupational health and safety
• Functioning of the controls in Multitasking
• Storage structure and structure of system parameters
• Programming and integrating background tasks
• Synchronisation of a foreground and background task
• Using joint data elements
• Using interrupt programming
• Sequence chains and dispatcher programming
• Creating a background task with different priorities
• Proposed solutions

Prerequisites
• Basic course PG1
• Computer skills

Information
Course duration: 4 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-MIG: Migration

Target group
Commisioning engineers, programmers, service personnel

Course goals
- In the course Migration, the procedure for the migration of a production system from S4C+ to IRC5 is carried out using the relevant equipment
- Participants make use of RobotStudio to a large extent
- Installation of RobotStudio on own PC

Contents
- Occupational Safety
- Data backup (manual)
- System building in RobotStudio
- Comparison of old and new parameter structure
- Preparation of data for porting
- Hints for the selection of new mechanics
- Testing and optimizing new equipment

Prerequisites
- Basic course IRC5 PG1
- Computer skills
- Please supply your own PC with admin rights

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-MMV: MultiMove

Target group

Commisioning engineers, programmers, plant manager, maintenance technicians electrics, project managers, planners

Course goals

- Understanding MultiMove
- Commissioning and programming MultiMove systems
- Measuring and monitoring the associated coordinate systems
- Writing movement programs (independent, synchronous, coordinated)
- Mastering Special MMV declarations and instructions

Contents

- Occupational health and safety
- Structure of the hardware
- Creating a system with MultiMove
- Calibration of monitoring systems
- Getting to know measurement methods for tool / work object and basic coordinates (Applying measurement routines)
- Testing the coordination of movement
- System parameters and backup
- Loading, editing, starting up and saving tasks
- Programming of independent, synchronized and coordinated movements
- Controlling movement tasks with additional management tasks

Prerequisites

- Basic course PG1
- Computer skills

Information

Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant
Notes: Exercises on robots are performed on the systems and types of robots that are available at the Training Center for Robots

Contact

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QUOTATION
VIA EMAIL

Overview of training plan

1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-PM: PickMaster 3 basics

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Carrying out the electrical and mechanical commissioning of the robot system
- Knowing the basic functions of PickMaster
- Connecting material handling technology to the robot system
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- System structure
- Installation of the PickMaster software
- Structure and wiring of a PickMaster system
- Structure of the robot programs
- Defining lines and projects
- Calibrating the camera
- Calibrating material handling technology
- PLC connection
- Backing up the whole system

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons per company
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-PN: ProfiNet

Target group
Commisioning engineers, service personnel, programmers

Course goals
• Logging I/O Unit onto ProfiNet Bus System via IRC5 serial interface
• Configuration of the serial interface
• Dealing with faults

Contents
• ProfiNet Basics
• Creating ProfiNet Topology
• ProfiSafe
• Configuration of the serial interface
• Creating and managing a new project
  (saving, compiling, loading, testing and archiving)
• Analysing and rectifying faults
• Component replacement

Prerequisites
• IRC5 PG2 or IRC5 SE or IRC5 PS-I
• Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-RS-AWPP: RobotStudio ArcWelding PowerPac

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Offline programming of arc welding programs using RobotStudio
- Taking into account collision detection and arm configuration
- Program / process optimization
- Implementation on actual welding equipment

Contents
- Building an ArcWelding PowerPac
- Interacting with an AW-PP interface
- Importing geometry
- Library function
- Creation of robot positions relative to geometry
- Create a welding system
- Programming welding seams offline
- Create welding parameter templates
- Synchronizing sequences with a virtual machine, thus creating a Rapid structure
- Loading the program into a real welding cell and correcting positions

Prerequisites
- IRC5 APT-S1 Inert gas welding
- IRC5 PS-RS RobotStudio
- Please supply your own PC with admin rights

Information
Course duration: 3 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-RS-Online: RobotStudio Online

Target Group
Commisioning engineers, plant managers, maintenance and service personnel

Course goals
- Use RobotStudio in practice with the robot controller
- This course does not cover CAD programming in RobotStudio

Contents
- Creation and modification of systems, as well as booting systems
- Networking, design and online communication with RobotStudio
- Creating so-called "relationships" between the robot controller and virtual systems (transmission and comparison of data elements)
- I/O configuration
- Creation of virtual duplicates, program editor
- Online tools, "Job" creation
- Online signal analysis

Prerequisites
- Basic course PG1 of the respective controller generation
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,910 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-RWMT: RobotWare Machine Tending

Target group
Programmers, commisioning engineers, plant managers,
Electrical equipment service personnel,
employees of companies with material handling robots

Course goals
- Integration of RobotWare Machine Tending in an
  automated material handling system

Contents
- Configuration of the User-Interface
- Homepos Running
- Knowledge of datatypes, instructions / functions
- Programming guidelines
- Event handling
- Operation and remote control with signal interface
- RobotWare Machine Tending Powerpack

Prerequisites
- Basic course PG1
- Knowledge of working with RobotStudio
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-S+EPS: SafeMove and EPS

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Connecting an initiator
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMove application
- Help routines for supporting SafeMove
- Using the TestSignalViewer to integrate external axes
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-SP: SafeMovePro

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Working with Pre- and Postlogic
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMovePro application with visual SafeMove
- Help routines for validation SafeMove
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course IRC5 PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

Certification safety commissioning engineer

The technical rules for operational safety (TRBS) indicate the state of the Engineering, occupational medicine and hygiene, as well as other scientific findings for the provision and use of work equipment and for the operation of equipment in need of monitoring.

These TRBS concretized the scope and the conditions of the industrial safety regulation. In compliance with the technical rules can the employer assume that the corresponding Requirements of the Regulation are met. If the employer choose another solution then he have to reach the same safety and the same health protection.

Contents
- Final exam for all courses of the training series (IRC5 PG1, IRC5 PS-S, IRC5 Machine Safety, IRC5 PS-S-Adm)
- Award of certificates

Note
The technical knowledge must be refreshed every 5 years. This can be done by participating in a safety inspection performed by an experienced safety commissioning engineer.

Prerequisites
- Basic course IRC5 PG1 or IRC5 YuMi 1 and IRC5 PS-Safe Move or SaveMovePro and IRC5 Machine Safety and IRC5 PS-S-Adm SafeMove Administrator
- Computer skills

Information
Course duration: 1 hour
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 250 EUR

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-SPS-S7: Step 7

Target group
Commissioning engineers, programmers, maintenance technician electrics

Course goals
- Understand the software of the training system with pneumatic and electrical units and sensors in relation to the ABB robot interface
- Troubleshooting with the Simatic manager in a specified sequential program
- Interface in the hardware configuration EA-level to the PLC program
- Make simple process changes and optimizations.

Contents
- Introduction to the Simatic manager
- Hardware configuration
- I/O in variable tables (VAT)
- Organizational modules
- Kop, FBD and AWL editor
- Inputs and outputs, addressing, assignments
- AND, OR, ANDNOT, etc.
- Apply timer and counter
- Flank formation, functions, subroutines
- Power paths and networks
- Archive and dearchive
- Perform fault diagnosis

Prerequisites
- IRC5 PS-PN ProfiNet
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–4 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-X1: Programming external axes

Target group
Planners, project managers, commissioning engineers, programmers, maintenance technician electrics

Course goals
- Getting to know the control functions
- Using external axes in the robot system
- Moving the robot or the work object using coordinated external axes

Contents
- Occupational health and safety
- Programming with an axis that rotates a device
- Programming uncoordinated linear and rotating axes
- Programming coordinated linear and rotating axes
- Programming dependent axes
- Programming independent axes
- Programming a robot on a process axis
- Measuring coordinate systems and moved work objects

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-X2: Configuring external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Dimensioning hardware components
- Installing additional axes
- Configure the software
- Check the operation of all components

Contents
- Occupational safety
- Schematics, connection variants
- Rectifiers, driver stages, motor units for external axes
- Compile configuration according to specifications
- Select / create open configuration
- Use encrypted configuration
- Handling aids
- Function check and troubleshooting

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-X3: Trimming external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Control intervention and getting to know additional axes
- Optimized control
- Evaluation of the quality of control in relation to the automation task

Contents
- Occupational health and safety
- Fine-tuning servo control by recording the control response
- Utilizing TuneMaster
- Displaying and recording control signals

Prerequisites
- IRC5 PS-X2: Configuring external axes
- Electrical expertise
- Computer skills

Information
Course duration: 2.5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-YuMi

Target Group
Programmers, commisioning engineers, plant managers, project managers, planners and maintenance technicians electrics with experience of IRC5 who want to use the YuMi robot system.

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimizing and the documentation of simple movement programs
- Basic knowledge of IRC5 is a prerequisite

Contents
- Occupational health and safety
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
- IRC5 PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. **Special programming as required**
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 MRK: Human-Robot-Collaboration

Target group
Planner, construction engineers, programmers, commissioning engineers, project managers and safety experts

Course goals
Insight into machine safety with the focus on MRK applications

Contents
- Definition and rules on the subject of MRK
  (DIN 101218-1 and-2 and ISO/TS15066)
- Carrying out risk assessments according to DIN 12100
- Carrying out pressure and force measurements
- Verification and validation of security functions according
  to DIN 13849-1 and 2
- Define the 4 protection principles:
  1. Safety-related monitored standstill;
  2. Manual guidance;
  3. Speed and distance monitoring;
  4. Power and force limitation
- Performance and force measurement with YuMi
- Carrying out force measurements
- Calculation example of a safety function
- Validation

Prerequisites
Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,070 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. **Safety**
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-S-Adm: SafeMove Administrator

Target group
Programmers, commisioning engineers, plant managers and service personnel, responsible for programming with SafeMove

Course goals
- Testing and acceptance of SafeMove programming
- Access concept and documentation

Contents
- Occupational health and safety
- Over-run principle
- Simulation in RobotStudio
- Testing on a robot
- Managing access rights
- Documentation of the complete safety concept
- Final examination for all courses of the training series: (IRC5 PG1, IRC5 PS-S, IRC5 MS, IRC5 PS-S-Adm)
- Presentation of certificates and permits

Prerequisites
IRC5 PS-S SafeMove or IRC5 PS-SP SafeMove Pro and IRC5 Machine Safety

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. **Safety**
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PG2: Programming basics 2

Target group
Programmers, project managers, planners, commissioning engineers

Course goals
- Using the options provided by control for the application
- Devising and testing concepts for the optimum use of the system or for solving application tests
- Operating and learning the editing and testing options on the robot in RobotStudio (online functionality) and with the virtual control
- The application of a programming tool for editing and testing programs on the computer

Contents
- Occupational health and safety
- Using the extended set of commands and optional arguments
- Producing and using your own routines and modules
- Programming your own instructions and functions
- System parameters (use of the system signals, password protection, etc.)
- Troubleshooting and interrupt programming
- Booting up the system (installation of the operating system)
- Calibrating the measurement system
- Local, global and routine data
- Writing programs on the computer (offline and online)

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. **IRC5 PG2: Programming basics 2**
7. IRC5 PS-RS2: RobotStudio 2
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PS-RS2: RobotStudio 2

Target Group
Offline programmers, simulation and construction engineers, commisioning engineers, planners

Course goals
- Implementation of simulation tasks for new systems with SmartComponents
- Carry out cycle time investigations
- Optimization and modification of existing systems with RobotStudio

Contents
- Features relating to the integration of existing programs into RobotStudio
- Visualization of SafeMove zones
- SmartComponents
- System design with material flow and logic components
- I/O configuration in simulation and control
- Bringing movement to graphic objects
- Screenmaker, for customizing teach pendant screens

Prerequisites
- IRC5 PS-RS1: RobotStudio 1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,330 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. **IRC5 PS-RS2: RobotStudio 2**
8. IRC5 PG3: Programming basics 3
9. Individual refresher course / advanced course

IRC5 PG3: Programming basics 3

Target group
Programmers, procedural developers, commissioning engineers

Course goals
- Production and application of complex instructions and programming techniques
- Use of extended programming functions

Contents
- Occupational health and safety
- Changing compiled data elements
- Dynamic access of data elements
- Integrating instructions you have written yourself
- Programming world zones for surveying the working area and defining home zones
- Extended interrupt applications
- Automatic loading and saving of modules
- Processing strings
- Dynamic routine access / late connection
- Extended troubleshooting / error numbers you have written yourself
- Producing log files, writing data in the log file
- Measuring clock intervals
- Data types you have written yourself
- Arrays
- Calculating intermediate positions from teached positions
- System data search with subsequent sorting function
- Adjusting system parameters

Prerequisites
- Participation in the course on Programming basics 2 or the IRC5 Upgrade workshop
- Computer skills
- Programming experience

Information
Course duration: 5 days
Number of participants: 3 – 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,390 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. IRC5 PS-RS1: RobotStudio 1
4. Special programming as required
5. Safety
6. IRC5 PG2: Programming basics 2
7. IRC5 PS-RS2: RobotStudio 2
8. **IRC5 PG3: Programming basics 3**
9. Individual refresher course / advanced course

ABB

Industrial robot IRC5
Commissioning engineer training plan

For detailed information about a course module, click on it.

Individual refresher course / advanced course

IRC5 PG2: Programming basics 2

Safety

IRC5 PS-RS1: RobotStudio 1

Special programming as required

Application engineering courses as required

IRC5 PS-RS-Online: RobotStudio Online

IRC5 PS-I: Initiation

IRC5 YuMi2: Advanced

IRC5 PG1: Programming basics 1

IRC5 Upgrade Workshop: Robot specialists

IRC5 PG1-YuMi

IRC5 PG1: Programming basics 1

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Performing handling tasks
- Programming robot movements and controlling the gripper

Prerequisites
Computer skills

Information
Course duration: 5 or 4 days (Express)
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,170 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 PG1: Programming basics 1**
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 Upgrade Workshop: Robot specialists

Target group
- Robot specialists

Course goals
- Advanced programming skills
- Gaining the prerequisites to attend IRC5 PG3

Contents
- Occupational health and safety
- Main topics from basic courses IRC5 PG1 and PG2
- Prioritization of topics at the start of training
- Perform contents individually
- Consideration and deeper examination of know issues in-and-around IRC5

Prerequisites
- Robot controller expert
- Several years of experience in robotic installation, commissioning and programming
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–4 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5 Upgrade Workshop: Robot specialists**
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 YuMi1: YuMi basics

Target Group
Programmers, commisioning engineers, plant managers, project managers, planners, maintenance technicians electrics, exclusively for those who use the YuMi robot system. An alternative method to achieve the same result would be to take part in the standard course IRC5 PG1, followed by the extension course IRC5 PS-YuMi

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimising and the documentation of simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant, RobotStudio, RobotStudio App
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status reports
- Backup
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3 – 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
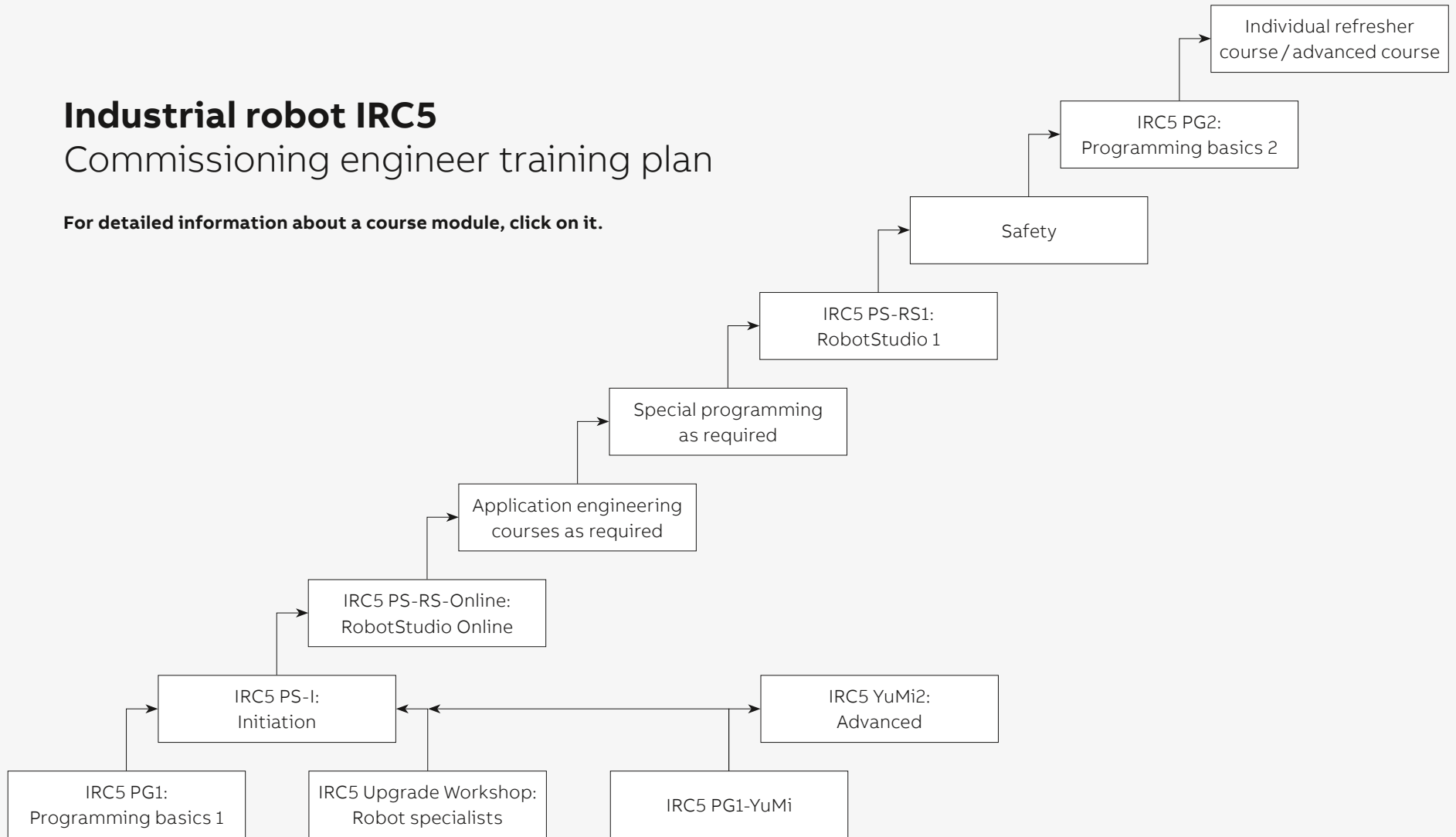Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 Yumi1: YuMi basics**
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 YuMi2: YuMi advanced

Target Group
Programmers, commissioning engineers, system operators, maintenance technician electrics

Course goals
- Commissioning and programming of YuMi robotic systems
- Use of IntegratedVision as well as interfaces to external sensors

Contents
- Occupational health and safety
- Commissioning and deepening of programming
- MultiMove application for synchronized movements
- Use IntegratedVision for part detection
- Interfaces for external sensors

Prerequisites
IRC5 YuMi1 basics or IRC5 PG1 with IRC5 PS-YuMi

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,390 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5 YuMi2: YuMi advanced**
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-I: Initiation

Target group
Commisioning engineers, programmers

Course goals
- For course IRC5 PS-I (Commissioning), tips will be provided for building a new system and the operating system for the controls will be installed
- The participant will use RobotStudio (online functionality) more
- Topics that are only briefly addressed in the course (e.g. system parameters) are independently practised by the participants with the help of the documentation
- Installation of the robot software on the participant's own computer

Contents
- Occupational health and safety
- Explaining programming regulations in accordance with ABB standards
- Programming branches and loops
- System parameters: Meaning, change, backup
- Circuit diagrams (security and I / O signals)
- Producing a system, installation of the control software
- Converting process descriptions into functional solutions

Prerequisites
- Basic course PG1
- Computer skills
- Please supply your own PC with admin rights
- Electrical expert

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **IRC5 PS-I: Initiation**
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-RS-Online: RobotStudio Online

Target Group
Commisioning engineers, plant managers, maintenance and service personnel

Course goals
- Use RobotStudio in practice with the robot controller
- This course does not cover CAD programming in RobotStudio

Contents
- Creation and modification of systems, as well as booting systems
- Networking, design and online communication with RobotStudio
- Creating so-called "relationships" between the robot controller and virtual systems (transmission and comparison of data elements)
- I/O configuration
- Creation of virtual duplicates, program editor
- Online tools, "Job" creation
- Online signal analysis

Prerequisites
- Basic course PG1 of the respective controller generation
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,910 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. **IRC5 PS-RS-Online: RobotStudio Online**
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

APT-IDFPS-B: Sealing Basics

Target group
Programmers, plant operators, project managers, planners, commissioning engineers, maintenance technicians who work in the field of sealing and seam sealing.

Course goals
- Using the IDFP system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Independently developing, implementing, testing, optimising and documenting simple application programs
- Making changes/optimisations to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related data types, instructions and software commands
- Programming adhesive seams
- Evaluating and optimising seam results
- Architecture of the "IntegratedProzessSystem"
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Backup and diagnosis

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. **Application engineering courses as required**
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 APT-IDFPS-ME: Sealing Mechanic

Target group
Mechanical service personnel, application engineers

Course goals
- Performing necessary maintenance, replacing components or worn parts, servicing and error diagnostics
- Making the necessary calibrations on mechanical components
- Making changes to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related instructions and software commands
- Getting to know and applying application related data types
- Carrying out maintenance and repairs on SPA400 / SPA410
- Carrying out maintenance and repairs on the dosing device
- Functional testing of the hardware components
- Performing settings and calibrations
- Using and understanding the relevant maintenance instructions

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. **Application engineering courses as required**
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 APT-IDFPS-SE: Sealing Electric

Target Group
Commisioning engineers, electrical service and application personnel

Course goals
- System overview
- To locate faults in the system
- Reducing downtime to a minimum by rapid error identification
- Ability to commission an IDFP system

Contents
- Occupational health and safety
- Detailed description of the form and function of the data backup
- Working with schematics
- Practical exercises for error detection, systematic troubleshooting using appropriate software (RobView, RobotStudio, terminal program)
- Creating a system
- Loading and executing test programs
- Getting to know the IDFP structure, soft and hardware
- Basic settings of the IDFP control
- Solving application problems
- Carrying out an IPS software update
- Connections of the application modules in the IRC5 controller
- Swopping components and tuning the system

Prerequisites
- Basic course PG1
- Computer skills
- Electro-technical training

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. **Application engineering courses as required**
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 APT-P: Spot welding

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- This application gives you the skills you need to safely move the IRB with integrated spot welding tongs
- Setting up spot welding tongs on the IRB
- Teaching basic skills on the structure and process in a spot welding plant
- Recognising and optimising problematic processes
- Changing and / or optimising the application

Contents
- Occupational health and safety in dealing with the application
- Mechanical and electrical structure of the application
- Teaching the application software SpotWare
- Connecting the welding controls to the controls of the robot system
- Getting to know and applying application related instructions and software commands
- Getting to know and applying application related data types
- Adjusting application related system parameters
- Tong measurement
- Writing and testing application program

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 2 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,480 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. **Application engineering courses as required**
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 APT-RB: Roller beading

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- This application gives you the skills you need to safely move the IRB with integrated roller beading tool
- Setting up a roll beading tool on the IRB
- Teaching basic skills on the structure and process in a roll beading application
- Recognising and optimising problematic processes
- Changing and / or optimising the application

Contents
- Occupational health and safety in dealing with the application
- Mechanical and electrical structure of the application
- How the system works
- Adjusting application related system parameters
- Getting to know and applying application related instructions and software commands
- Discussing RH system modules
- Performing RH calibration
- Writing and testing application program

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. **Application engineering courses as required**
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 APT-S1: Shielded arc welding 1

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- Making changes to the application
- Making weld seams

Contents
- Occupational health and safety in dealing with the application
- Teaching the application software ArcWare
- Using the ABB-Production-Manager
- Getting to know and applying application related instructions and software commands
- Programming weld seams with predefined welding data
- Correcting weld seams

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. **Application engineering courses as required**
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 APT-S2: Shielded arc welding 2

Target group
Programmers, commissioning engineers, plant operators, application technicians

Course goals
- The independent programming of a welding plant
- Making changes/optimisations to the application

Contents
- Occupational health and safety in dealing with the application
- Safety with robot welding plants
- Occupational health and safety of inert gas welding
- Adjusting application related system parameters
- Systematic structure of a welding program with observation of the programming guidelines
- Definition of seam, pendulum and welding data
- Programming weld seams
- Programming with external axes
- Troubleshooting the welding program
- Error diagnostics in the welding program
- Automatic TCP measurement and monitoring
- Basics of the different types of arcs
- Welding with different material strengths
- Documenting the welding routines

Prerequisites
- Participation in the application course on arc welding 1
- Arc welding skills
- Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. **Application engineering courses as required**
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-C: Conveyor tracking

Target group
Project managers, programmers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Connecting material handling technology to the robot system
- The programming of manufacturing processes with material handling synchronisation
- Individual course goals can be agreed together with the participants

Contents
- Occupational health and safety
- Installation of the additional hardware components such as encoder module, encoder and start signal system
- Determining the corresponding parameters
- Functional testing
- Programming the material handling synchronisation

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-EE: Energy Efficiency

Target group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Utilisation of the energy saving features incorporated in RobotStudio
- Reducing energy consumption and wear
- Achieve gains in productivity

Contents
- Occupational health and safety
- Monitoring energy, temperature and performance at the robot as well as in the virtual system
- Data analysis and processing
- Motion optimisation: paths, velocities, acceleration
- Analysis of waiting time in a program
- Energy related RAPID-commands and system parameters

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 2.5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-FCM: Force Control for Machining

Target group
Planners, commissioning engineers, programmers

Course goals
- Understanding and setting up the Force Control for Machining option
- Getting to know the functionality of the force-controlled process regulation on the machined part
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- Producing a system with the Force Control for Machining option with the help of the Graphical User Interface (GUI)
- Getting to know and using the graphical user interface
- Aligning the machined part with the force-controlled process regulation
- Getting to know and applying application relating instructions and functions
- Programming the application processes – force-controlled process and speed-controlled process
- Assembly basics

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-IV: Integrated Vision

Target group
Planners, commissioning engineers, programmers, maintenance personnel

Course goals
Mechanical and electrical integration of camera systems

Contents
- System Overview
- Installation and Setup
- RobotStudio and FlexPendant user interface
- Camera configuration and calibration
- Vision tools and RAPID instructions
- Functions and data types

Prerequisites
- Participation in the course on Programming basics 2 or the IRC5 Upgrade workshop
- Computer skills

Information
Course duration: 4 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-M: Multitasking

Target group
Project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Getting to know and programming the functionality of controls when applying the option of Multitasking

Contents
- Occupational health and safety
- Functioning of the controls in Multitasking
- Storage structure and structure of system parameters
- Programming and integrating background tasks
- Synchronisation of a foreground and background task
- Using joint data elements
- Using interrupt programming
- Sequence chains and dispatcher programming
- Creating a background task with different priorities
- Proposed solutions

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-MMV: MultiMove

Target group
Commisioning engineers, programmers, plant manager, maintenance technicians electrics, project managers, planners

Course goals
- Understanding MultiMove
- Commissioning and programming MultiMove systems
- Measuring and monitoring the associated coordinate systems
- Writing movement programs (independent, synchronous, coordinated)
- Mastering Special MMV declarations and instructions

Contents
- Occupational health and safety
- Structure of the hardware
- Creating a system with MultiMove
- Calibration of monitoring systems
- Getting to know measurement methods for tool / work object and basic coordinates (Applying measurement routines)
- Testing the coordination of movement
- System parameters and backup
- Loading, editing, starting up and saving tasks
- Programming of independent, synchronized and coordinated movements
- Controlling movement tasks with additional management tasks

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant
Notes: Exercises on robots are performed on the systems and types of robots that are available at the Training Center for Robots

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-PM: PickMaster 3 basics

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Carrying out the electrical and mechanical commissioning of the robot system
- Knowing the basic functions of PickMaster
- Connecting material handling technology to the robot system
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- System structure
- Installation of the PickMaster software
- Structure and wiring of a PickMaster system
- Structure of the robot programs
- Defining lines and projects
- Calibrating the camera
- Calibrating material handling technology
- PLC connection
- Backing up the whole system

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons per company
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-PN: ProfiNet

Target group
Commisioning engineers, service personnel, programmers

Course goals
- Logging I/O Unit onto ProfiNet Bus System via IRC5 serial interface
- Configuration of the serial interface
- Dealing with faults

Contents
- ProfiNet Basics
- Creating ProfiNet Topology
- ProfiSafe
- Configuration of the serial interface
- Creating and managing a new project
  (saving, compiling, loading, testing and archiving)
- Analysing and rectifying faults
- Component replacement

Prerequisites
- IRC5 PG2 or IRC5 SE or IRC5 PS-I
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-RS2: RobotStudio 2

Target Group
Offline programmers, simulation and construction engineers, commisioning engineers, planners

Course goals
- Implementation of simulation tasks for new systems with SmartComponents
- Carry out cycle time investigations
- Optimization and modification of existing systems with RobotStudio

Contents
- Features relating to the integration of existing programs into RobotStudio
- Visualization of SafeMove zones
- SmartComponents
- System design with material flow and logic components
- I/O configuration in simulation and control
- Bringing movement to graphic objects
- Screenmaker, for customizing teach pendant screens

Prerequisites
- IRC5 PS-RS1: RobotStudio 1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,330 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-RWMT: RobotWare Machine Tending

Target group
Programmers, commisioning engineers, plant managers,
Electrical equipment service personnel,
employees of companies with material handling robots

Course goals
- Integration of RobotWare Machine Tending in an automated material handling system

Contents
- Configuration of the User-Interface
- Homepos Running
- Knowledge of datatypes, instructions / functions
- Programming guidelines
- Event handling
- Operation and remote control with signal interface
- RobotWare Machine Tending Powerpack

Prerequisites
- Basic course PG1
- Knowledge of working with RobotStudio
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
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roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-S+EPS: SafeMove and EPS

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

 Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Connecting an initiator
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMove application
- Help routines for supporting SafeMove
- Using the TestSignalViewer to integrate external axes
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-SP: SafeMovePro

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Working with Pre- and Postlogic
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMovePro application with visual SafeMove
- Help routines for validation SafeMove
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course IRC5 PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

Certification safety commissioning engineer

The technical rules for operational safety (TRBS) indicate the state of the Engineering, occupational medicine and hygiene, as well as other scientific findings for the provision and use of work equipment and for the operation of equipment in need of monitoring.

These TRBS concretized the scope and the conditions of the industrial safety regulation. In compliance with the technical rules can the employer assume that the corresponding Requirements of the Regulation are met. If the employer choose another solution then he have to reach the same safety and the same health protection.

Contents
- Final exam for all courses of the training series (IRC5 PG1, IRC5 PS-S, IRC5 Machine Safety, IRC5 PS-S-Adm)
- Award of certificates and IDs IRC5

Note
If the qualified person has not taken any exams for a longer period of time, you must refresh experiences by participating in third party exams and renew their professional knowledge. The technical knowledge is to renew every 5 years.

Prerequisites
- Basic course IRC5 PG1 or IRC5 YuMi 1 and IRC5 PS-Safe Move or SaveMovePro and IRC5 Machine Safety and IRC5 PS-S-Adm SafeMove Administrator
- Computer skills

Information
Course duration: 1 hour
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 250 EUR

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-SPS-S7: Step 7

Target group
Commissioning engineers, programmers, maintenance technician electrics

Course goals
• Understand the software of the training system with pneumatic and electrical units and sensors in relation to the ABB robot interface
• Troubleshooting with the Simatic manager in a specified sequential program
• Interface in the hardware configuration EA-level to the PLC program
• Make simple process changes and optimizations.

Contents
• Introduction to the Simatic manager
• Hardware configuration
• I/O in variable tables (VAT)
• Organizational modules
• Kop, FBD and AWL editor
• Inputs and outputs, addressing, assignments
• AND, OR, ANDNOT, etc.
• Apply timer and counter
• Flank formation, functions, subroutines
• Power paths and networks
• Archive and dearchive
• Perform fault diagnosis

Prerequisites
• IRC5 PS-PN ProfiNet
• Computer skills

Information
Course duration: 5 days
Number of participants: 3–4 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-X1: Programming external axes

Target group
Planners, project managers, commissioning engineers, programmers, maintenance technician electrics

Course goals
- Getting to know the control functions
- Using external axes in the robot system
- Moving the robot or the work object using coordinated external axes

Contents
- Occupational health and safety
- Programming with an axis that rotates a device
- Programming uncoordinated linear and rotating axes
- Programming coordinated linear and rotating axes
- Programming dependent axes
- Programming independent axes
- Programming a robot on a process axis
- Measuring coordinate systems and moved work objects

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-X2: Configuring external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Dimensioning hardware components
- Installing additional axes
- Configure the software
- Check the operation of all components

Contents
- Occupational safety
- Schematics, connection variants
- Rectifiers, driver stages, motor units for external axes
- Compile configuration according to specifications
- Select / create open configuration
- Use encrypted configuration
- Handling aids
- Function check and troubleshooting

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-X3: Trimming external axes

Target group

Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Control intervention and getting to know additional axes
- Optimized control
- Evaluation of the quality of control in relation to the automation task

Contents
- Occupational health and safety
- Fine-tuning servo control by recording the control response
- Utilizing TuneMaster
- Displaying and recording control signals

Prerequisites
- IRC5 PS-X2: Configuring external axes
- Electrical expertise
- Computer skills

Information
Course duration: 2.5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-YuMi

Target Group

Programmers, commisioning engineers, plant managers, project managers, planners and maintenance technicians electrics with experience of IRC5 who want to use the YuMi robot system.

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimizing and the documentation of simple movement programs
- Basic knowledge of IRC5 is a prerequisite

Contents
- Occupational health and safety
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
- IRC5 PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. **Special programming as required**
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-RS1: RobotStudio 1

Target Group
- Planners, commissioning engineers, programmers, plant managers and project managers

Course goals
- Visualising and creating complex tasks for robot control systems using the RobotStudio offline tool
- Programming without direct intervention in the robot (offline)

Contents
- Occupational health and safety, installation and licensing issues
- Work surface functions
- Data management and project related structures in RobotStudio
- Integration of geometric data, CAD data formats
- Possibilities for creation of systems and units
- Design of the robot work environment in RobotStudio
- Creation and editing graphic components
- Base frame systems in RobotStudio
- Creation and measurement of tools and work objects
- Bringing movement to graphic objects
- Creating positions and paths
- Check accessibility of positions
- Automatic path generation on curved bodies
- Synchronizing data between the unit and the virtual system
- Integration of the program editor
- Possibilities for simulation, cycle times, collision check and signal analysis
- Recording applications
- Incorporating external axes
- Programming a MultiMove station
- Replication and practical testing on a robot training unit

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. **IRC5 PS-RS1: RobotStudio 1**
7. Safety
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 Machine Safety

Target group
Plant managers, maintenance personnel, safety officials, designers, planners

Course goals
Insight into Machine Safety requirements of robotic workstations

Contents
- Overview and classification
- In context: Machinery Directives 2006/42/EC – Product Safety Act
- Insight into: Machinery Directives 2006/42/EC, 1st Appendix
  a) Basic health and safety requirements
  b) Explanation: Machinery – incomplete machinery
  c) EC – Declaration of Conformity – Installation Instructions
  d) Commissioning and start-up of a machine
  e) Applying directives and harmonized standards
  f) Approach to risk assessment
  g) Risk appraisal
  h) Risk evaluation
- MRK with conventional robot systems
- Case Study: Robot safety of the latest generation

Prerequisites
Computer skills

Information
Course duration: 4 days
Number of participants: 3 – 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. **Safety**
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 MRK: Human-Robot-Collaboration

Target group
Planner, construction engineers, programmers, commissioning engineers, project managers and safety experts

Course goals
Insight into machine safety with the focus on MRK applications

Contents
- Definition and rules on the subject of MRK
  (DIN 101218-1 and-2 and ISO/TS15066)
- Carrying out risk assessments according to DIN 12100
- Carrying out pressure and force measurements
- Verification and validation of security functions according
  to DIN 13849-1 and 2
- Define the 4 protection principles:
  1. Safety-related monitored standstill;
  2. Manual guidance;
  3. Speed and distance monitoring;
  4. Power and force limitation
- Performance and force measurement with YuMi
- Carrying out force measurements
- Calculation example of a safety function
- Validation

Prerequisites
Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,070 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. **Safety**
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PS-S-Adm: SafeMove Administrator

Target group
Programmers, commisioning engineers, plant managers and service personnel, responsible for programming with SafeMove

Course goals
- Testing and acceptance of SafeMove programming
- Access concept and documentation

Contents
- Occupational health and safety
- Over-run principle
- Simulation in RobotStudio
- Testing on a robot
- Managing access rights
- Documentation of the complete safety concept
- Final examination for all courses of the training series:
  (IRC5 PG1, IRC5 PS-S, IRC5 MS, IRC5 PS-S-Adm)
- Presentation of certificates and permits

Prerequisites
IRC5 PS-S SafeMove or IRC5 PS-SP SafeMove Pro and IRC5 Machine Safety

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. **Safety**
8. IRC5 PG2: Programming basics 2
9. Individual refresher course / advanced course

IRC5 PG2: Programming basics 2

Target group
Programmers, project managers, planners, commissioning engineers

Course goals
- Using the options provided by control for the application
- Devising and testing concepts for the optimum use of the system or for solving application tests
- Operating and learning the editing and testing options on the robot in RobotStudio (online functionality) and with the virtual control
- The application of a programming tool for editing and testing programs on the computer

Contents
- Occupational health and safety
- Using the extended set of commands and optional arguments
- Producing and using your own routines and modules
- Programming your own instructions and functions
- System parameters (use of the system signals, password protection, etc.)
- Troubleshooting and interrupt programming
- Booting up the system (installation of the operating system)
- Calibrating the measurement system
- Local, global and routine data
- Writing programs on the computer (offline and online)

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 PS-I: Initiation
3. IRC5 PS-RS-Online: RobotStudio Online
4. Application engineering courses as required
5. Special programming as required
6. IRC5 PS-RS1: RobotStudio 1
7. Safety
8. **IRC5 PG2: Programming basics 2**
9. Individual refresher course / advanced course

Industrial robot IRC5
Mechanical service personnel training plan

For detailed information about a course module, click on it.

```
                              ┌────────────────────────┐
                              │  Individual refresher   │
                              │  course / advanced course│
                              └────────────────────────┘
                                         ▲
                         ┌──────────────────┐
                         │    Calibrate     │
                         └──────────────────┘
                                ▲
              ┌──────────────────┐
              │ Mechanics courses │
              └──────────────────┘
                     ▲
   ┌──────────────┐
   │  IRC5 BE:     │
   │  Operation    │
   └──────────────┘
```

IRC5 BE: Operation

Target group
Plant operators, mechanical service personnel, application engineers

Course goals
- Independent execution of operating functions
- Switching on and starting up the robot system
- Moving the mechanics with a joystick
- Loading, testing and optimising simple movement programs
- Recognising and rectifying simple faults and service interruptions (e.g. emergency stop)

Contents
- Occupational health and safety
- Structure and function of the robot system
- Types of movement in manual and automatic operation
- Monitoring input and output signals
- Loading and saving modules and programs
- Error messages and status report

Prerequisites
None

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,380 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5 BE: Operation**
2. Mechanics courses
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 120: Mechanics course on robot mechanics IRB 120

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

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**QUOTATION
VIA EMAIL**

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 140: Mechanics course on robot mechanics IRB 140

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

Contact
Phone: +49 60 31 85-233
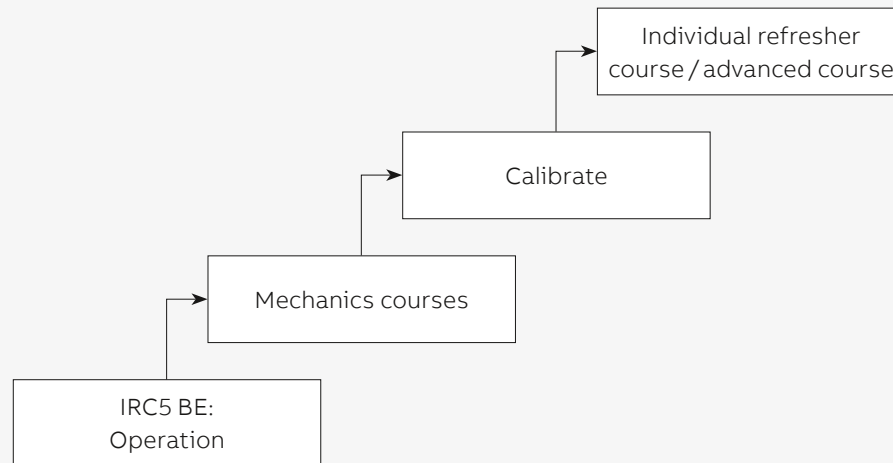roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 1200: Mechanics course on robot mechanics IRB 1200

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 1600: Mechanics course on robot mechanics IRB 1600

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 1600ID: Mechanics course on robot mechanics IRB 1600ID

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 2400: Mechanics course on robot mechanics IRB 2400 / M2004

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 2600: Mechanics course on robot mechanics IRB 2600

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 2600ID: Mechanics course on robot mechanics IRB 2600ID

Target group
Mechanical service personel

Course goals
• Rapid diagnosis of the cause of the error can minimize downtime
• Replacing defective parts in good time
• Maintaining the robot mechanics in accordance with regulations

Contents
• Occupational health and safety
• Backup
• Explanation and functioning of the robot mechanics
• Disassembly and assembly of sub-assemblies and individual parts
• Calibrating robots (fine-calibration)
• Use of special tools
• Testing the robot system
• Performing maintenance and adjustment work

Prerequisites
• Operating course BE or basic course PG1
• Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 360: Mechanics course on robot mechanics IRB 360

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 3 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 4400: Mechanics course on robot mechanics IRB 4400

Target group
Mechanical service personel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work
- Working with the SIS-System
- Updating the SMB- (Robot) Memory
- SafeMove
- CalPendulum
- Axis Calibration

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 4 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 4400 FP: Mechanics course on robot mechanics IRB 4400 FoundryPrime

Target group
Mechanical service personel, who maintain Foundry Prime robots

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in FoundryPrime in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Foundry Prime mechanics course module: Explanation of the special features in Foundry Prime version. Specific topics concerning operation and maintenance of Foundry Prime
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 4 days
Number of participants: 3 – 4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

The training course will take place using modified standard robotic mechanisms. Foundry Prime-specific details will be explained using sample parts and/or the documentation

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 4600: Mechanics course on robot mechanics IRB 4600

Target group
Mechanical service personel

Course goals
• Rapid diagnosis of the cause of the error can minimize downtime
• Replacing defective parts in good time
• Maintaining the robot mechanics in accordance with regulations

Contents
• Occupational health and safety
• Backup
• Explanation and functioning of the robot mechanics
• Disassembly and assembly of sub-assemblies and individual parts
• Calibrating robots (fine-calibration)
• Use of special tools
• Testing the robot system
• Performing maintenance and adjustment work

Prerequisites
• Operating course BE or basic course PG1
• Bring your own protective shoes and work clothes

Information
Course duration: 4 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 4600 FP: Mechanics course on robot mechanics IRB 4600 FoundryPrime

Target group
Mechanical service personel, who maintain Foundry Prime robots

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in FoundryPrime in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Foundry Prime mechanics course module: Explanation of the special features in Foundry Prime version. Specific topics concerning operation and maintenance of Foundry Prime
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 4 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

The training course will take place using modified standard robotic mechanisms. Foundry Prime-specific details will be explained using sample parts and/or the documentation

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 6640: Mechanics course on robot mechanics IRB 6640

Target group
Mechanical service personnel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 5 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 3,070 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 6640 FP : Mechanics course on robot mechanics IRB 6640 FoundryPrime

Target group
Mechanical service personnel, who maintain Foundry Prime robots

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in FoundryPrime in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Foundry Prime mechanics course module: Explanation of the special features in Foundry Prime version. Specific topics concerning operation and maintenance of Foundry Prime
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 5 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 3,070 EUR / participant

The training course will take place using modified standard robotic mechanisms. Foundry Prime-specific details will be explained using sample parts and/or the documentation

Contact
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roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME 6700: Mechanics course on robot mechanics IRB 6700

Target group
Mechanical service personnel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 5 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 3,070 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 ME FP: Mechanics course on FoundryPrime

Target group
Mechanical service personnel, who maintain Foundry Prime robots

Course goals
- Learn about the special features of the Foundry Prime version
- Master specific requirements for operation

Contents
- Occupational health and safety
- Explanation of the special features in Foundry Prime version
- Specific topics concerning operation and maintenance of Foundry Prime

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 2 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,480 EUR / participant

Contact
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**QUOTATION
VIA EMAIL**

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

IRC5 Kal: Calibration Methods for ABB robotsTarget group

Mechanical service personnel, maintenance technicians electrics

Course goals
Safe control of the following common calibration methods for ABB Robots:
- Levelmeter
- Calibration pendulum
- Axis calibration (fine calibration and reference calibration)
- CalPoint
- Alternative calibration method

Contents
- Structure of the measuring system
- Error detection and correction
- Finely calibrate the robot with the different methods

Prerequisites
Operator course, basic course PG1 or comparable knowledge acquired.

Information
Course duration: 2 days
Number of participants: max. 6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,480 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 BE: Operation
2. **Mechanics courses**
3. Calibrate
4. Individual refresher course / advanced course

Industrial robot IRC5
Training plan maintenance technician electrics

For detailed information about a course module, click on it.

Individual refresher
course / advanced course

Calibrate

Safety

Special programming
as required

Application engineering
courses as required

IRC5 SD:
Faults and Diagnostics

IRC5 PS-RS-Online:
RobotStudio Online

IRC5 SE:
Service Electric

IRC5 YuMi2:
YuMi advanced

IRC5 PG1:
Programming basics 1

IRC5 YuMi1:
YuMi basics

IRC5 PG1: Programming basics 1

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Performing handling tasks
- Programming robot movements and controlling the gripper

Prerequisites
Computer skills

Information
Course duration: 5 or 4 days (Express)
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,170 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 PG1: Programming basics 1**
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. Special programming as required
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 YuMi1: YuMi basics

Target Group
Programmers, commisioning engineers, plant managers, project managers, planners, maintenance technicians electrics, exclusively for those who use the YuMi robot system. An alternative method to achieve the same result would be to take part in the standard course IRC5 PG1, followed by the extension course IRC5 PS-YuMi

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimising and the documentation of simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant, RobotStudio, RobotStudio App
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status reports
- Backup
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
Phone: +49 60 31 85-233
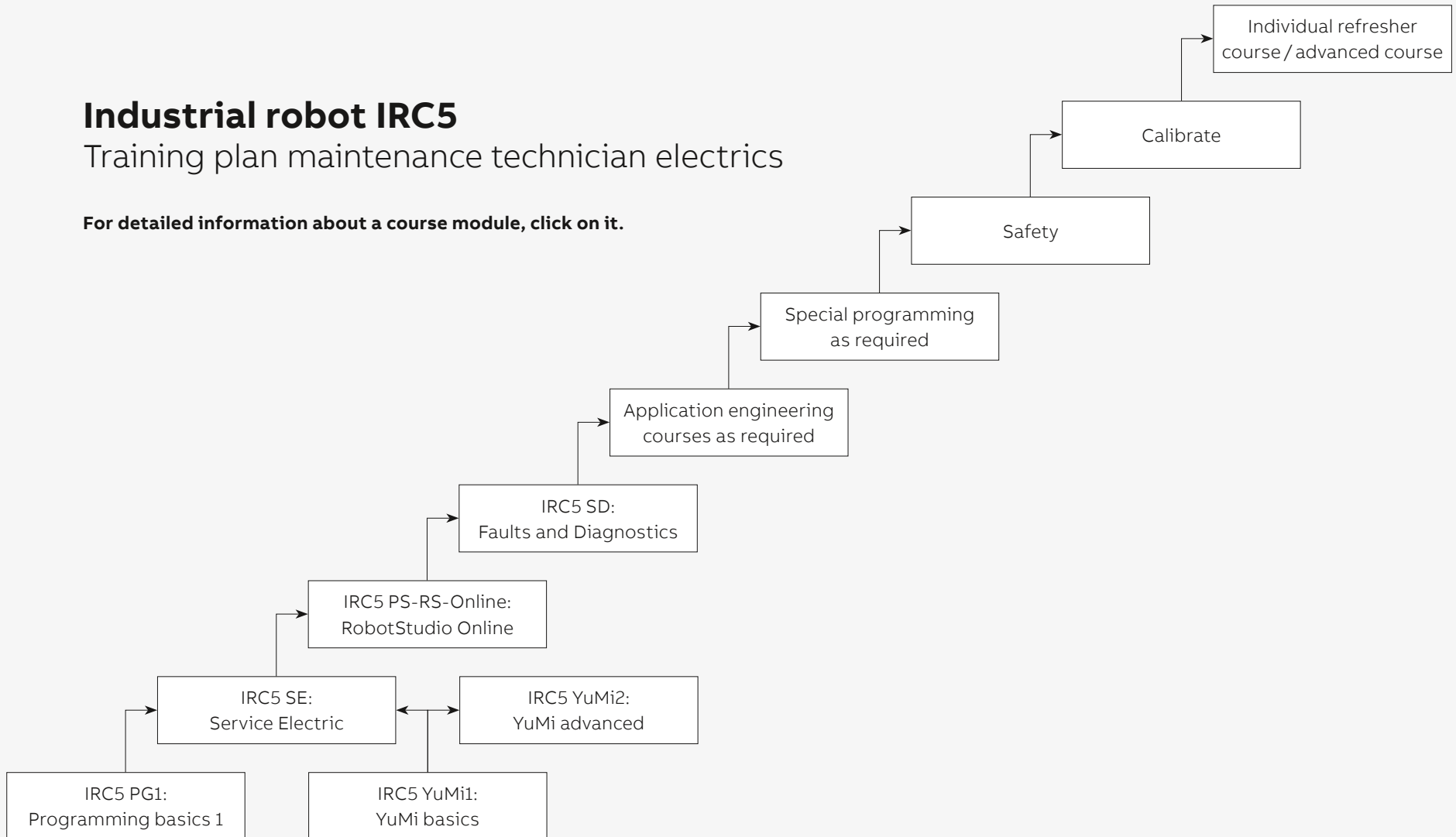roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 YuMi1: YuMi basics**
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. Special programming as required
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 YuMi2: YuMi advanced

Target Group
Programmers, commissioning engineers, system operators, maintenance technician electrics

Course goals
- Commissioning and programming of YuMi robotic systems
- Use of IntegratedVision as well as interfaces to external sensors

Contents
- Occupational health and safety
- Commissioning and deepening of programming
- MultiMove application for synchronized movements
- Use IntegratedVision for part detection
- Interfaces for external sensors

Prerequisites
IRC5 YuMi1 basics or IRC5 PG1 with IRC5 PS-YuMi

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,390 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **IRC5 YuMi2: YuMi advanced**
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. Special programming as required
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 SE: Electrical equipment course

Target group
Commissioning technicians, maintenance technicians electrics

Course goals
- System overview
- Locating system faults
- Rapid diagnosis of the cause of the error can minimize downtime

Contents
- Occupational health and safety
- Detailed explanation of the structure and function of the robot and controller
- Program errors and how to recognize them
- System parameters: Meaning, changing, backup
- Signal connection (DeviceNet, ProfiNet)
- Checking calibration, updating revolution counter, fine calibration
- Working with circuit diagrams
- Practical exercises in error recognition, systematic error diagnostics with the help of suitable software (RobotStudio, terminal program)
- Producing a system, installation of the control software
- Loading and executing test programs

Prerequisites
- Basic course PG1
- Computer skills
- Electrical engineering qualification

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **IRC5 SE: Service Electric**
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. Special programming as required
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-RS-Online: RobotStudio Online

Target Group
Commisioning engineers, plant managers, maintenance and service personnel

Course goals
- Use RobotStudio in practice with the robot controller
- This course does not cover CAD programming in RobotStudio

Contents
- Creation and modification of systems, as well as booting systems
- Networking, design and online communication with RobotStudio
- Creating so-called "relationships" between the robot controller and virtual systems (transmission and comparison of data elements)
- I/O configuration
- Creation of virtual duplicates, program editor
- Online tools, "Job" creation
- Online signal analysis

Prerequisites
- Basic course PG1 of the respective controller generation
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,910 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **IRC5 SE: Service Electric**
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. Special programming as required
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 SD: Faults and Diagnostics

Target group
Start-up engineers, maintenance technicians electrics

Course goals
- Expansion of knowledge about systematic troubleshooting
- Application of the diagnostic facilities of the IRC5 controller
- Ordered methods of combating faults

Contents
- Occupational health and safety
- Refresher, deepening and expanding the basics from the service course (SE)
- Develop a fault and analysis strategy for more efficient troubleshooting based on case studies
- Plan and structure procedures based on the troubleshooting method (MeFes)
- Aftercare and avoidance of future faults
- Use measurement tools to perform diagnostics (e.g. oscilloscopes, bus testers, etc.)
- Using ABB supplied software and recommendations for using external software

Prerequisites
- Participation in a IRC5 SE course
- Electro-technical training
- Sound computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,120 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. **IRC5 SD: Faults and Diagnostics**
5. Application engineering courses as required
6. Special programming as required
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

APT-IDFPS-B: Sealing Basics

Target group

Programmers, plant operators, project managers, planners, commissioning engineers, maintenance technicians who work in the field of sealing and seam sealing.

Course goals

- Using the IDFP system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Independently developing, implementing, testing, optimising and documenting simple application programs
- Making changes/optimisations to the application

Contents

- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related data types, instructions and software commands
- Programming adhesive seams
- Evaluating and optimising seam results
- Architecture of the "IntegratedProzessSystem"
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Backup and diagnosis

Prerequisites

- Basic course PG1
- Computer skills

Information

Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact

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roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan

1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. **Application engineering courses as required**
6. Special programming as required
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 APT-IDFPS-SE: Sealing Electric

Target Group
Commisioning engineers, electrical service and application personnel

Course goals
- System overview
- To locate faults in the system
- Reducing downtime to a minimum by rapid error identification
- Ability to commission an IDFP system

Contents
- Occupational health and safety
- Detailed description of the form and function of the data backup
- Working with schematics
- Practical exercises for error detection, systematic troubleshooting using appropriate software (RobView, RobotStudio, terminal program)
- Creating a system
- Loading and executing test programs
- Getting to know the IDFP structure, soft and hardware
- Basic settings of the IDFP control
- Solving application problems
- Carrying out an IPS software update
- Connections of the application modules in the IRC5 controller
- Swopping components and tuning the system

Prerequisites
- Basic course PG1
- Computer skills
- Electro-technical training

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. **Application engineering courses as required**
6. Special programming as required
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-C: Conveyor tracking

Target group
Project managers, programmers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Connecting material handling technology to the robot system
- The programming of manufacturing processes with material handling synchronisation
- Individual course goals can be agreed together with the participants

Contents
- Occupational health and safety
- Installation of the additional hardware components such as encoder module, encoder and start signal system
- Determining the corresponding parameters
- Functional testing
- Programming the material handling synchronisation

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-EE: Energy Efficiency

Target group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Utilisation of the energy saving features incorporated in RobotStudio
- Reducing energy consumption and wear
- Achieve gains in productivity

Contents
- Occupational health and safety
- Monitoring energy, temperature and performance at the robot as well as in the virtual system
- Data analysis and processing
- Motion optimisation: paths, velocities, acceleration
- Analysis of waiting time in a program
- Energy related RAPID-commands and system parameters

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 2.5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-FCM: Force Control for Machining

Target group
Planners, commissioning engineers, programmers

Course goals
- Understanding and setting up the Force Control for Machining option
- Getting to know the functionality of the force-controlled process regulation on the machined part
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- Producing a system with the Force Control for Machining option with the help of the Graphical User Interface (GUI)
- Getting to know and using the graphical user interface
- Aligning the machined part with the force-controlled process regulation
- Getting to know and applying application relating instructions and functions
- Programming the application processes – force-controlled process and speed-controlled process
- Assembly basics

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-IV: Integrated Vision

Target group
Planners, commissioning engineers, programmers, maintenance personnel

Course goals
Mechanical and electrical integration of camera systems

Contents
- System Overview
- Installation and Setup
- RobotStudio and FlexPendant user interface
- Camera configuration and calibration
- Vision tools and RAPID instructions
- Functions and data types

Prerequisites
- Participation in the course on Programming basics 2 or the IRC5 Upgrade workshop
- Computer skills

Information
Course duration: 4 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-M: Multitasking

Target group
Project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
* Getting to know and programming the functionality of controls when applying the option of Multitasking

Contents
* Occupational health and safety
* Functioning of the controls in Multitasking
* Storage structure and structure of system parameters
* Programming and integrating background tasks
* Synchronisation of a foreground and background task
* Using joint data elements
* Using interrupt programming
* Sequence chains and dispatcher programming
* Creating a background task with different priorities
* Proposed solutions

Prerequisites
* Basic course PG1
* Computer skills

Information
Course duration: 4 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-MMV: MultiMove

Target group
Commisioning engineers, programmers, plant manager, maintenance technicians electrics, project managers, planners

Course goals
- Understanding MultiMove
- Commissioning and programming MultiMove systems
- Measuring and monitoring the associated coordinate systems
- Writing movement programs (independent, synchronous, coordinated)
- Mastering Special MMV declarations and instructions

Contents
- Occupational health and safety
- Structure of the hardware
- Creating a system with MultiMove
- Calibration of monitoring systems
- Getting to know measurement methods for tool / work object and basic coordinates (Applying measurement routines)
- Testing the coordination of movement
- System parameters and backup
- Loading, editing, starting up and saving tasks
- Programming of independent, synchronized and coordinated movements
- Controlling movement tasks with additional management tasks

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant
Notes: Exercises on robots are performed on the systems and types of robots that are available at the Training Center for Robots

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-PN: ProfiNet

Target group
Commisioning engineers, service personnel, programmers

Course goals
- Logging I/O Unit onto ProfiNet Bus System via IRC5 serial interface
- Configuration of the serial interface
- Dealing with faults

Contents
- ProfiNet Basics
- Creating ProfiNet Topology
- ProfiSafe
- Configuration of the serial interface
- Creating and managing a new project
  (saving, compiling, loading, testing and archiving)
- Analysing and rectifying faults
- Component replacement

Prerequisites
- IRC5 PG2 or IRC5 SE or IRC5 PS-I
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-RWMT: RobotWare Machine Tending

Target group
Programmers, commisioning engineers, plant managers,
Electrical equipment service personnel,
employees of companies with material handling robots

Course goals
• Integration of RobotWare Machine Tending in an
  automated material handling system

Contents
• Configuration of the User-Interface
• Homepos Running
• Knowledge of datatypes, instructions / functions
• Programming guidelines
• Event handling
• Operation and remote control with signal interface
• RobotWare Machine Tending Powerpack

Prerequisites
• Basic course PG1
• Knowledge of working with RobotStudio
• Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-S+EPS: SafeMove and EPS

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Connecting an initiator
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMove application
- Help routines for supporting SafeMove
- Using the TestSignalViewer to integrate external axes
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-SP: SafeMovePro

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
• Mechanical / Electrical integration of the SafeMove card
• Creating the system prerequisites for the operation of SafeMove
• Configuration of the SafeMove card

Contents
• Occupational health and safety
• Mechanical installation and electrical integration of the SafeMove card
• Working with Pre- and Postlogic
• Producing a system with the SafeMove option
• Creating a security user
• Configuration of the SafeMovePro application with visual SafeMove
• Help routines for validation SafeMove
• Testing and documentation of the SafeMove configuration
• Final functional testing

Prerequisites
• Basic course IRC5 PG1
• Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

Certification safety commissioning engineer

The technical rules for operational safety (TRBS) indicate the state of the Engineering, occupational medicine and hygiene, as well as other scientific findings for the provision and use of work equipment and for the operation of equipment in need of monitoring.

These TRBS concretized the scope and the conditions of the industrial safety regulation. In compliance with the technical rules can the employer assume that the corresponding Requirements of the Regulation are met. If the employer choose another solution then he have to reach the same safety and the same health protection.

Contents
- Final exam for all courses of the training series
  (IRC5 PG1, IRC5 PS-S, IRC5 Machine Safety, IRC5 PS-S-Adm)
- Award of certificates and IDs IRC5

Note
If the qualified person has not taken any exams for a longer period of time, you must refresh experiences by participating in third party exams and renew their professional knowledge. The technical knowledge is to renew every 5 years.

Prerequisites
- Basic course IRC5 PG1 or IRC5 YuMi 1 and IRC5 PS-Safe Move or SaveMovePro and IRC5 Machine Safety and IRC5 PS-S-Adm SafeMove Administrator
- Computer skills

Information
Course duration: 1 hour
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 250 EUR

Contact
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roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-SPS-S7: Step 7

Target group
Commissioning engineers, programmers, maintenance technician electrics

Course goals
- Understand the software of the training system with pneumatic and electrical units and sensors in relation to the ABB robot interface
- Troubleshooting with the Simatic manager in a specified sequential program
- Interface in the hardware configuration EA-level to the PLC program
- Make simple process changes and optimizations.

Contents
- Introduction to the Simatic manager
- Hardware configuration
- I/O in variable tables (VAT)
- Organizational modules
- Kop, FBD and AWL editor
- Inputs and outputs, addressing, assignments
- AND, OR, ANDNOT, etc.
- Apply timer and counter
- Flank formation, functions, subroutines
- Power paths and networks
- Archive and dearchive
- Perform fault diagnosis

Prerequisites
- IRC5 PS-PN ProfiNet
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–4 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-X1: Programming external axes

Target group
Planners, project managers, commissioning engineers, programmers, maintenance technician electrics

Course goals
- Getting to know the control functions
- Using external axes in the robot system
- Moving the robot or the work object using coordinated external axes

Contents
- Occupational health and safety
- Programming with an axis that rotates a device
- Programming uncoordinated linear and rotating axes
- Programming coordinated linear and rotating axes
- Programming dependent axes
- Programming independent axes
- Programming a robot on a process axis
- Measuring coordinate systems and moved work objects

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-X2: Configuring external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Dimensioning hardware components
- Installing additional axes
- Configure the software
- Check the operation of all components

Contents
- Occupational safety
- Schematics, connection variants
- Rectifiers, driver stages, motor units for external axes
- Compile configuration according to specifications
- Select / create open configuration
- Use encrypted configuration
- Handling aids
- Function check and troubleshooting

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-X3: Trimming external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Control intervention and getting to know additional axes
- Optimized control
- Evaluation of the quality of control in relation to the automation task

Contents
- Occupational health and safety
- Fine-tuning servo control by recording the control response
- Utilizing TuneMaster
- Displaying and recording control signals

Prerequisites
- IRC5 PS-X2: Configuring external axes
- Electrical expertise
- Computer skills

Information
Course duration: 2.5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-YuMi

Target Group
Programmers, commisioning engineers, plant managers, project managers, planners and maintenance technicians electrics with experience of IRC5 who want to use the YuMi robot system.

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimizing and the documentation of simple movement programs
- Basic knowledge of IRC5 is a prerequisite

Contents
- Occupational health and safety
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
- IRC5 PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. **Special programming as required**
7. Safety
8. Calibrate
9. Individual refresher course / advanced course

IRC5 Machine Safety

Target group
Plant managers, maintenance personnel, safety officials, designers, planners

Course goals
Insight into Machine Safety requirements of robotic workstations

Contents
- Overview and classification
- In context: Machinery Directives 2006/42/EC – Product Safety Act
- Insight into: Machinery Directives 2006/42/EC, 1st Appendix
  a) Basic health and safety requirements
  b) Explanation: Machinery – incomplete machinery
  c) EC – Declaration of Conformity – Installation Instructions
  d) Commissioning and start-up of a machine
  e) Applying directives and harmonized standards
  f) Approach to risk assessment
  g) Risk appraisal
  h) Risk evaluation
- MRK with conventional robot systems
- Case Study: Robot safety of the latest generation

Prerequisites
Computer skills

Information
Course duration: 4 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. Special programming as required
7. **Safety**
8. Calibrate
9. Individual refresher course / advanced course

IRC5 MRK: Human-Robot-Collaboration

Target group
Planner, construction engineers, programmers, commissioning engineers, project managers and safety experts

Course goals
Insight into machine safety with the focus on MRK applications

Contents
- Definition and rules on the subject of MRK (DIN 101218-1 and-2 and ISO/TS15066)
- Carrying out risk assessments according to DIN 12100
- Carrying out pressure and force measurements
- Verification and validation of security functions according to DIN 13849-1 and 2
- Define the 4 protection principles:
  1. Safety-related monitored standstill;
  2. Manual guidance;
  3. Speed and distance monitoring;
  4. Power and force limitation
- Performance and force measurement with YuMi
- Carrying out force measurements
- Calculation example of a safety function
- Validation

Prerequisites
Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,070 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. Special programming as required
7. **Safety**
8. Calibrate
9. Individual refresher course / advanced course

IRC5 PS-S-Adm: SafeMove Administrator

Target group
Programmers, commisioning engineers, plant managers and service personnel, responsible for programming with SafeMove

Course goals
- Testing and acceptance of SafeMove programming
- Access concept and documentation

Contents
- Occupational health and safety
- Over-run principle
- Simulation in RobotStudio
- Testing on a robot
- Managing access rights
- Documentation of the complete safety concept
- Final examination for all courses of the training series: (IRC5 PG1, IRC5 PS-S, IRC5 MS, IRC5 PS-S-Adm)
- Presentation of certificates and permits

Prerequisites
IRC5 PS-S SafeMove or IRC5 PS-SP SafeMove Pro and IRC5 Machine Safety

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
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5. Application engineering courses as required
6. Special programming as required
7. **Safety**
8. Calibrate
9. Individual refresher course / advanced course

IRC5 Kal: Calibration Methods for ABB robotsTarget group

Mechanical service personnel, maintenance technicians electrics

Course goals
Safe control of the following common calibration methods for ABB Robots:
- Levelmeter
- Calibration pendulum
- Axis calibration (fine calibration and reference calibration)
- CalPoint
- Alternative calibration method

Contents
- Structure of the measuring system
- Error detection and correction
- Finely calibrate the robot with the different methods

Prerequisites
Operator course, basic course PG1 or comparable knowledge acquired.

Information
Course duration: 2 days
Number of participants: max. 6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,480 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. IRC5 SE: Service Electric
3. IRC5 PS-RS-Online: RobotStudio Online
4. IRC5 SD: Faults and Diagnostics
5. Application engineering courses as required
6. Special programming as required
7. Safety
8. **Calibrate**
9. Individual refresher course / advanced course

Industrial robot IRC5
Application engineer training plan

For detailed information about a course module, click on it.

```
                        ┌─────────────────────────┐
                        │ Individual refresher     │
                     ┌─▶│ course / advanced course │
                     │  └─────────────────────────┘
          ┌──────────────────────┐
          │ Special programming   │
       ┌─▶│ as required           │
       │  └──────────────────────┘
┌──────────────────────────┐
│ Application engineering   │
│ courses as required       │◀┐
└──────────────────────────┘ │
                    ┌──────────────────────┐
                    │ IRC5 PG1:             │
                    │ Programming basics 1  │
                    └──────────────────────┘
```

IRC5 PG1: Programming basics 1

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Performing handling tasks
- Programming robot movements and controlling the gripper

Prerequisites
Computer skills

Information
Course duration: 5 or 4 days (Express)
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,170 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 PG1: Programming basics 1**
2. Application engineering courses as required
3. Special programming as required
4. Individual refresher course / advanced course

APT-IDFPS-B: Sealing Basics

Target group
Programmers, plant operators, project managers, planners, commissioning engineers, maintenance technicians who work in the field of sealing and seam sealing.

Course goals
- Using the IDFP system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Independently developing, implementing, testing, optimising and documenting simple application programs
- Making changes/optimisations to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related data types, instructions and software commands
- Programming adhesive seams
- Evaluating and optimising seam results
- Architecture of the "IntegratedProzessSystem"
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Backup and diagnosis

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
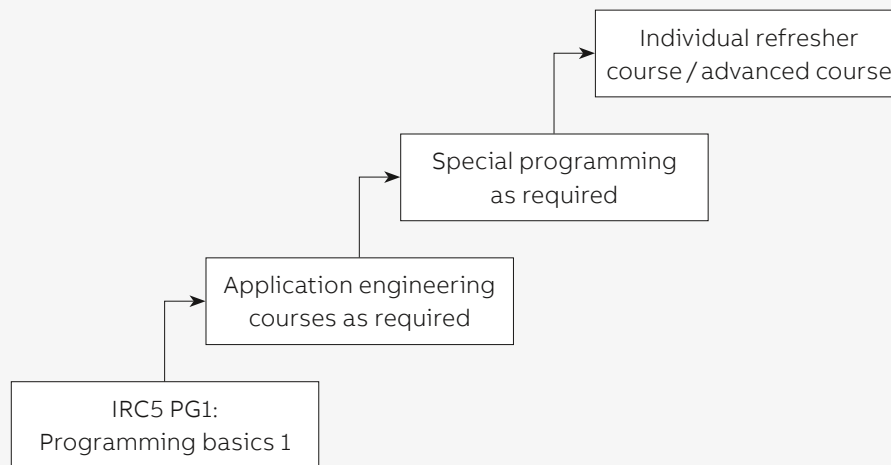roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-IDFPS-ME: Sealing Mechanic

Target group
Mechanical service personnel, application engineers

Course goals
- Performing necessary maintenance, replacing components or worn parts, servicing and error diagnostics
- Making the necessary calibrations on mechanical components
- Making changes to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related instructions and software commands
- Getting to know and applying application related data types
- Carrying out maintenance and repairs on SPA400 / SPA410
- Carrying out maintenance and repairs on the dosing device
- Functional testing of the hardware components
- Performing settings and calibrations
- Using and understanding the relevant maintenance instructions

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-IDFPS-SE: Sealing Electric

Target Group
Commisioning engineers, electrical service and application personnel

Course goals
- System overview
- To locate faults in the system
- Reducing downtime to a minimum by rapid error identification
- Ability to commission an IDFP system

Contents
- Occupational health and safety
- Detailed description of the form and function of the data backup
- Working with schematics
- Practical exercises for error detection, systematic troubleshooting using appropriate software (RobView, RobotStudio, terminal program)
- Creating a system
- Loading and executing test programs
- Getting to know the IDFP structure, soft and hardware
- Basic settings of the IDFP control
- Solving application problems
- Carrying out an IPS software update
- Connections of the application modules in the IRC5 controller
- Swopping components and tuning the system

Prerequisites
- Basic course PG1
- Computer skills
- Electro-technical training

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-IDFPG-B: Gluing Basics

Target Group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Using the IDFP system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application material
- Independently developing, implementing, testing, optimizing and documenting simple application programs
- Making changes/optimizations to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related data types, instructions and software commands
- Programming adhesive seams
- Evaluating and optimizing seam results
- Architecture of the "Integrated Process System"
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Backup and diagnosis

Prerequisites
- Basic course PG1 of the respective controller generation
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-IDFPG-ME: Gluing Mechanic

Target Group
Maintenance technicians for robotic mechanics, specialists in adhesive application

Course goals
- Performing necessary maintenance, replacing components or worn parts, servicing and error diagnostics
- Making the necessary calibrations on mechanical components
- Making changes to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functioning of the application "Integrated Dispensing Function Pac"
- Getting to know and applying application related instructions and software commands
- Getting to know and applying application related data types
- Maintenance and repairs on ABB-adhesive applicator, the doser and the integrated pump.
- Functional testing of the hardware components
- Performing settings and calibrations
- Using and understanding the relevant maintenance instructions

Prerequisites
- Basic course PG1 of the respective controller generation
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-IDFPG-ME: Gluing Electric

Target Group
Commisioning engineers, electrical service and application personnel who are in the "gluing" area active

Course goals
- System overview
- To locate faults in the system
- Reducing downtime to a minimum by rapid error identification
- Ability to commission an IDFP system

Contents
- Occupational health and safety
- Detailed description of the form and function of the data backup
- Working with schematics
- Practical exercises for error detection, systematic troubleshooting using appropriate software (RobView, RobotStudio, terminal program)
- Creating a system
- Loading and executing test programs
- Getting to know the IDFP structure, soft and hardware
- Basic settings of the IDFP control
- Solving application problems
- Carrying out an IPS software update
- Connections of the application modules in the IRC5 controller
- Exchanging components and tuning the system

Prerequisites
- Basic course PG1 of the respective controller generation
- Computer skills
- Electro-technical training

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-P: Spot welding

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- This application gives you the skills you need to safely move the IRB with integrated spot welding tongs
- Setting up spot welding tongs on the IRB
- Teaching basic skills on the structure and process in a spot welding plant
- Recognising and optimising problematic processes
- Changing and / or optimising the application

Contents
- Occupational health and safety in dealing with the application
- Mechanical and electrical structure of the application
- Teaching the application software SpotWare
- Connecting the welding controls to the controls of the robot system
- Getting to know and applying application related instructions and software commands
- Getting to know and applying application related data types
- Adjusting application related system parameters
- Tong measurement
- Writing and testing application program

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 2 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,480 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-RB: Roller beading

Target group

Programmers, commissioning engineers, plant managers, application engineers

Course goals

- This application gives you the skills you need to safely move the IRB with integrated roller beading tool
- Setting up a roll beading tool on the IRB
- Teaching basic skills on the structure and process in a roll beading application
- Recognising and optimising problematic processes
- Changing and / or optimising the application

Contents

- Occupational health and safety in dealing with the application
- Mechanical and electrical structure of the application
- How the system works
- Adjusting application related system parameters
- Getting to know and applying application related instructions and software commands
- Discussing RH system modules
- Performing RH calibration
- Writing and testing application program

Prerequisites

- Basic course PG1
- Computer skills

Information

Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact

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QUOTATION
VIA EMAIL

Overview of training plan

1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-S1: Shielded arc welding 1

Target group
Programmers, commissioning engineers, plant managers, application engineers

Course goals
- Making changes to the application
- Making weld seams

Contents
- Occupational health and safety in dealing with the application
- Teaching the application software ArcWare
- Using the ABB-Production-Manager
- Getting to know and applying application related instructions and software commands
- Programming weld seams with predefined welding data
- Correcting weld seams

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 APT-S2: Shielded arc welding 2

Target group
Programmers, commissioning engineers, plant operators, application technicians

Course goals
- The independent programming of a welding plant
- Making changes/optimisations to the application

Contents
- Occupational health and safety in dealing with the application
- Safety with robot welding plants
- Occupational health and safety of inert gas welding
- Adjusting application related system parameters
- Systematic structure of a welding program with observation of the programming guidelines
- Definition of seam, pendulum and welding data
- Programming weld seams
- Programming with external axes
- Troubleshooting the welding program
- Error diagnostics in the welding program
- Automatic TCP measurement and monitoring
- Basics of the different types of arcs
- Welding with different material strengths
- Documenting the welding routines

Prerequisites
- Participation in the application course on arc welding 1
- Arc welding skills
- Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. **Application engineering courses as required**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5 PS-C: Conveyor tracking

Target group
Project managers, programmers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Connecting material handling technology to the robot system
- The programming of manufacturing processes with material handling synchronisation
- Individual course goals can be agreed together with the participants

Contents
- Occupational health and safety
- Installation of the additional hardware components such as encoder module, encoder and start signal system
- Determining the corresponding parameters
- Functional testing
- Programming the material handling synchronisation

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-FCM: Force Control for Machining

Target group
Planners, commissioning engineers, programmers

Course goals
- Understanding and setting up the Force Control for Machining option
- Getting to know the functionality of the force-controlled process regulation on the machined part
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- Producing a system with the Force Control for Machining option with the help of the Graphical User Interface (GUI)
- Getting to know and using the graphical user interface
- Aligning the machined part with the force-controlled process regulation
- Getting to know and applying application relating instructions and functions
- Programming the application processes – force-controlled process and speed-controlled process
- Assembly basics

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-M: Multitasking

Target group
Project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Getting to know and programming the functionality of controls when applying the option of Multitasking

Contents
- Occupational health and safety
- Functioning of the controls in Multitasking
- Storage structure and structure of system parameters
- Programming and integrating background tasks
- Synchronisation of a foreground and background task
- Using joint data elements
- Using interrupt programming
- Sequence chains and dispatcher programming
- Creating a background task with different priorities
- Proposed solutions

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-MMV: MultiMove

Target group
Commisioning engineers, programmers, plant manager, maintenance technicians electrics, project managers, planners

Course goals
- Understanding MultiMove
- Commissioning and programming MultiMove systems
- Measuring and monitoring the associated coordinate systems
- Writing movement programs (independent, synchronous, coordinated)
- Mastering Special MMV declarations and instructions

Contents
- Occupational health and safety
- Structure of the hardware
- Creating a system with MultiMove
- Calibration of monitoring systems
- Getting to know measurement methods for tool / work object and basic coordinates (Applying measurement routines)
- Testing the coordination of movement
- System parameters and backup
- Loading, editing, starting up and saving tasks
- Programming of independent, synchronized and coordinated movements
- Controlling movement tasks with additional management tasks

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant
Notes: Exercises on robots are performed on the systems and types of robots that are available at the Training Center for Robots

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-PM: PickMaster 3 basics

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Carrying out the electrical and mechanical commissioning of the robot system
- Knowing the basic functions of PickMaster
- Connecting material handling technology to the robot system
- This course provides an important basis. For the implementation of own projects, an extensive deeper knowledge is required, accompanied by specific process expert coaching or self-study.

Contents
- Occupational health and safety
- System structure
- Installation of the PickMaster software
- Structure and wiring of a PickMaster system
- Structure of the robot programs
- Defining lines and projects
- Calibrating the camera
- Calibrating material handling technology
- PLC connection
- Backing up the whole system

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3 persons per company
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-RS-Online: RobotStudio Online

Target Group
Commisioning engineers, plant managers, maintenance and service personnel

Course goals
- Use RobotStudio in practice with the robot controller
- This course does not cover CAD programming in RobotStudio

Contents
- Creation and modification of systems, as well as booting systems
- Networking, design and online communication with RobotStudio
- Creating so-called "relationships" between the robot controller and virtual systems (transmission and comparison of data elements)
- I/O configuration
- Creation of virtual duplicates, program editor
- Online tools, "Job" creation
- Online signal analysis

Prerequisites
- Basic course PG1 of the respective controller generation
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,910 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-RS1: RobotStudio 1

Target Group
- Planners, commissioning engineers, programmers, plant managers and project managers

Course goals
- Visualising and creating complex tasks for robot control systems using the RobotStudio offline tool
- Programming without direct intervention in the robot (offline)

Contents
- Occupational health and safety, installation and licensing issues
- Work surface functions
- Data management and project related structures in RobotStudio
- Integration of geometric data, CAD data formats
- Possibilities for creation of systems and units
- Design of the robot work environment in RobotStudio
- Creation and editing graphic components
- Base frame systems in RobotStudio
- Creation and measurement of tools and work objects
- Bringing movement to graphic objects
- Creating positions and paths
- Check accessibility of positions
- Automatic path generation on curved bodies
- Synchronizing data between the unit and the virtual system
- Integration of the program editor
- Possibilities for simulation, cycle times, collision check and signal analysis
- Recording applications
- Incorporating external axes
- Programming a MultiMove station
- Replication and practical testing on a robot training unit

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-RS2: RobotStudio 2

Target Group
Offline programmers, simulation and construction engineers, commisioning engineers, planners

Course goals
- Implementation of simulation tasks for new systems with SmartComponents
- Carry out cycle time investigations
- Optimization and modification of existing systems with RobotStudio

Contents
- Features relating to the integration of existing programs into RobotStudio
- Visualization of SafeMove zones
- SmartComponents
- System design with material flow and logic components
- I/O configuration in simulation and control
- Bringing movement to graphic objects
- Screenmaker, for customizing teach pendant screens

Prerequisites
- IRC5 PS-RS1: RobotStudio 1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,330 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-S+EPS: SafeMove and EPS

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
• Mechanical / Electrical integration of the SafeMove card
• Creating the system prerequisites for the operation of SafeMove
• Configuration of the SafeMove card

Contents
• Occupational health and safety
• Mechanical installation and electrical integration of the SafeMove card
• Connecting an initiator
• Producing a system with the SafeMove option
• Creating a security user
• Configuration of the SafeMove application
• Help routines for supporting SafeMove
• Using the TestSignalViewer to integrate external axes
• Testing and documentation of the SafeMove configuration
• Final functional testing

Prerequisites
• Basic course PG1
• Computer skills

Information
Course duration: 4 days
Number of participants: 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5 PS-X1: Programming external axes

Target group
Planners, project managers, commissioning engineers, programmers, maintenance technician electrics

Course goals
- Getting to know the control functions
- Using external axes in the robot system
- Moving the robot or the work object using coordinated external axes

Contents
- Occupational health and safety
- Programming with an axis that rotates a device
- Programming uncoordinated linear and rotating axes
- Programming coordinated linear and rotating axes
- Programming dependent axes
- Programming independent axes
- Programming a robot on a process axis
- Measuring coordinate systems and moved work objects

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

ABB

IRC5 PS-X2: Configuring external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Dimensioning hardware components
- Installing additional axes
- Configure the software
- Check the operation of all components

Contents
- Occupational safety
- Schematics, connection variants
- Rectifiers, driver stages, motor units for external axes
- Compile configuration according to specifications
- Select / create open configuration
- Use encrypted configuration
- Handling aids
- Function check and troubleshooting

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

ABB

IRC5 PS-X3: Trimming external axes

Target group
Commisioning engineers, programmers, maintenance technicians electrics

Course goals
- Control intervention and getting to know additional axes
- Optimized control
- Evaluation of the quality of control in relation to the automation task

Contents
- Occupational health and safety
- Fine-tuning servo control by recording the control response
- Utilizing TuneMaster
- Displaying and recording control signals

Prerequisites
- IRC5 PS-X2: Configuring external axes
- Electrical expertise
- Computer skills

Information
Course duration: 2.5 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,700 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1
2. Application engineering courses as required
3. **Special programming as required**
4. Individual refresher course / advanced course

Industrial robot IRC5
Manager training plan

For detailed information about a course module, click on it.

```
                    ┌─────────────────┐
              ┌────▶│  IRC5 FÜ:       │
              │     │  Direction      │
              │     └─────────────────┘
              │
    ┌─────────┴───────┐
    │  IRC5:          │
    │  Introductory course │
    └─────────────────┘
```

IRC5: Introductory course – Industrial robots

Target group
Managers, planners, administrative staff

Course goals
- Getting to know the fields of application for robots
- Perform operating functions independently
- Manual operation
- Loading and testing programs
- Insight into the fields of work of plant operators, programmers and maintenance engineers
- Getting to know the way personnel and procedures cooperate

Contents
- Occupational health and safety
- Robot applications in production practice
- Configuration and function of a robot system
- Types of movement in manual and automatic mode
- Control of inputs and outputs
- Loading and saving modules and programs
- Error messages and situation description
- Documentation and technical support from ABB
- Contact persons and procedures for selected issues

Prerequisites
None

Information
Course duration: 2 days
Number of participants: 3 – 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,010 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5: Introductory course – Industrial robots**
2. IRC5 FÜ: Direction in production and maintenance

IRC5 FÜ: Direction in production and maintenance

Target group
Managers in maintenance and service

Course goals
- Knowledge about the concept of methodological troubleshooting
- Learning of techniques and methods for leadership
- Focus on communication, especially to non-verbal communication

Contents
Methodical Troubleshooting:
- Principles of methodical troubleshooting
- Compensation of obstacles/avoidance of thinking mistakes
- Procedure and checklists
- Elaboration of question- and thought-techniques
- Use the learned in specific cases

Techniques and methods of how to:
- defusing and deescalating situations
- keeping on track in almost all conversational situations
- performing safely and competently – without ever having to feel like this
- steering meetings and group situations well
- explaining difficult topics clear, binding and friendly

By playing typical practice cases:
- Meetings where you want to represent your own interests
- difficult topics with employees, peers and superiors
- group situations with the employees (distribution of tasks)
- Problem analysis and solution

Prerequisites
None

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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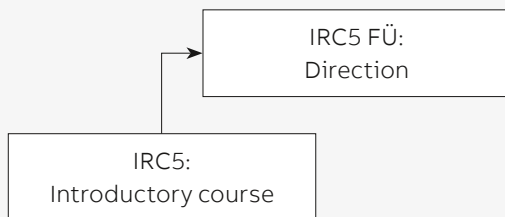roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5: Introductory course – Industrial robots
2. **IRC5 FÜ: Direction in production and maintenance**

Industrial robot IRC5
Ausbildungsplan Safety experts

For detailed information about a course module, click on it.

```
                            ┌─────────────────────────┐
                         ┌─▶│  Certification safety    │
                         │  │  commissioning engineer  │
                         │  └─────────────────────────┘
              ┌──────────────────────────┐
           ┌─▶│  IRC5 PS-S-Adm:          │              Responsible for
           │  │  SafeMove Administrator  │              Security-certified software
           │  └──────────────────────────┘
        ┌─────────────────────────┐
     ┌─▶│  IRC5 Machine Safety    │──────────────────┐  Guidelines and DIN standards
     │  └─────────────────────────┘                  │
     │                                                ▼
┌──────────────────────┐  ┌──────────────────┐  ┌──────────────────────────────┐
│  IRC5 PS-S+EPS:      │  │  IRC5 PS-SP:     │  │  IRC5 PS-MRK:                │  Configuration of
│  SaveMove and EPS    │  │  SaveMovePro     │  │  Human-Robot-Collaboration   │  Security-certified software
└──────────────────────┘  └──────────────────┘  └──────────────────────────────┘
     ▲                         ▲                         ▲
┌──────────────────────┐  ┌──────────────────┐          │
│  IRC5 PG1:           │  │  IRC5 YuMi1:     │──────────┘
│  Programming basics 1│  │  YuMi basics     │
└──────────────────────┘  └──────────────────┘
```

IRC5 PG1: Programming basics 1

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Performing handling tasks
- Programming robot movements and controlling the gripper

Prerequisites
Computer skills

Information
Course duration: 5 or 4 days (Express)
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,170 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5 PG1: Programming basics 1 or IRC5 YuMi1: YuMi basics**
2. SafeMove and EPS / SaveMovePro / MRK
3. IRC5 Machine Safety
4. IRC5 PS-S-Adm: SafeMove Administrator
5. Certification safety commissioning engineer

IRC5 YuMi1: YuMi basics

Target Group
Programmers, commisioning engineers, plant managers, project managers, planners, maintenance technicians electrics, exclusively for those who use the YuMi robot system. An alternative method to achieve the same result would be to take part in the standard course IRC5 PG1, followed by the extension course IRC5 PS-YuMi

Course goals
- Independent execution of YuMi operating functions
- Independently developing, implementing, testing, optimising and the documentation of simple movement programs

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant, RobotStudio, RobotStudio App
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Testing measuring system
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status reports
- Backup
- Using the YuMi App to program Pick and Place tasks
- Use of MultiMove for synchronized movement
- Introduction to the IntegratedVision application for object recognition

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
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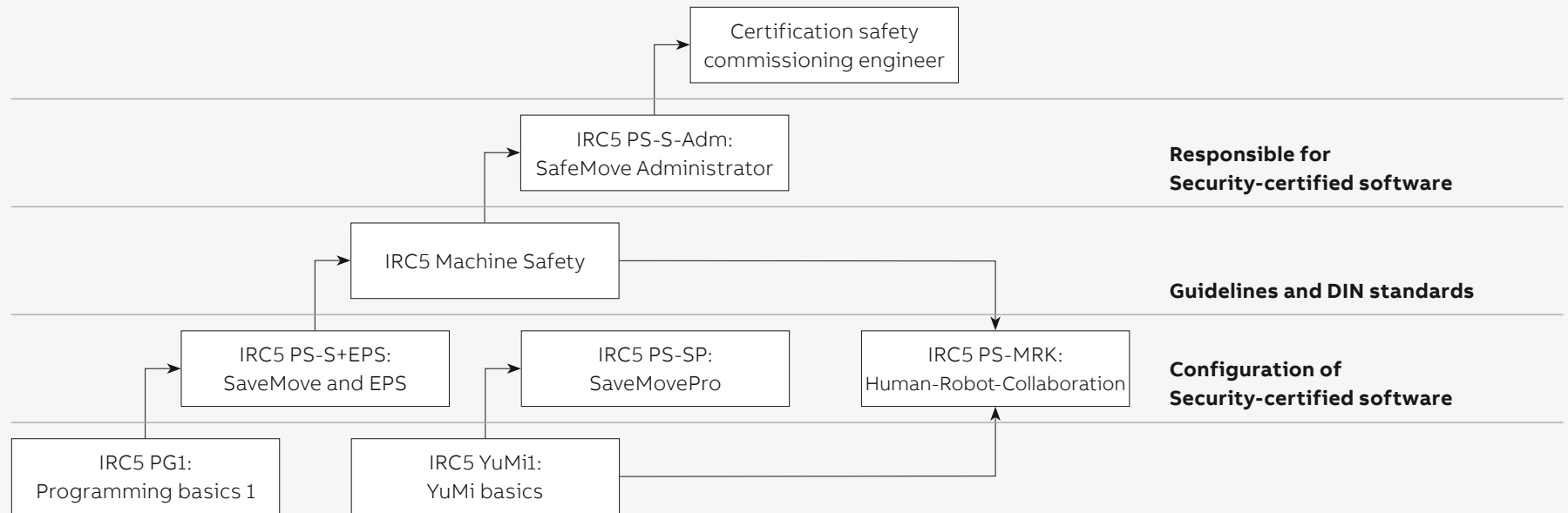roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5 PG1: Programming basics 1 or IRC5 YuMi1: YuMi basics**
2. SafeMove and EPS / SaveMovePro / MRK
3. IRC5 Machine Safety
4. IRC5 PS-S-Adm: SafeMove Administrator
5. Certification safety commissioning engineer

ABB

IRC5 PS-S+EPS: SafeMove and EPS

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Connecting an initiator
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMove application
- Help routines for supporting SafeMove
- Using the TestSignalViewer to integrate external axes
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1 or
   IRC5 YuMi1: YuMi basics
2. **SafeMove and EPS / SaveMovePro / MRK**
3. IRC5 Machine Safety
4. IRC5 PS-S-Adm: SafeMove Administrator
5. Certification safety commissioning engineer

IRC5 PS-SP: SafeMovePro

Target group
Planners, commissioning engineers, programmers, maintenance technicians electrics

Course goals
- Mechanical / Electrical integration of the SafeMove card
- Creating the system prerequisites for the operation of SafeMove
- Configuration of the SafeMove card

Contents
- Occupational health and safety
- Mechanical installation and electrical integration of the SafeMove card
- Working with Pre- and Postlogic
- Producing a system with the SafeMove option
- Creating a security user
- Configuration of the SafeMovePro application with visual SafeMove
- Help routines for validation SafeMove
- Testing and documentation of the SafeMove configuration
- Final functional testing

Prerequisites
- Basic course IRC5 PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1 or
   IRC5 YuMi1: YuMi basics
2. **SafeMove and EPS / SaveMovePro / MRK**
3. IRC5 Machine Safety
4. IRC5 PS-S-Adm: SafeMove Administrator
5. Certification safety commissioning engineer

IRC5 Machine Safety

Target group
Plant managers, maintenance personnel, safety officials, designers, planners

Course goals
Insight into Machine Safety requirements of robotic workstations

Contents
- Overview and classification
- In context: Machinery Directives 2006/42/EC – Product Safety Act
- Insight into: Machinery Directives 2006/42/EC, 1st Appendix
  a) Basic health and safety requirements
  b) Explanation: Machinery – incomplete machinery
  c) EC – Declaration of Conformity – Installation Instructions
  d) Commissioning and start-up of a machine
  e) Applying directives and harmonized standards
  f) Approach to risk assessment
  g) Risk appraisal
  h) Risk evaluation
- MRK with conventional robot systems
- Case Study: Robot safety of the latest generation

Prerequisites
Computer skills

Information
Course duration: 4 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1 or
   IRC5 YuMi1: YuMi basics
2. SafeMove and EPS / SaveMovePro / MRK
3. **IRC5 Machine Safety**
4. IRC5 PS-S-Adm: SafeMove Administrator
5. Certification safety commissioning engineer

IRC5 MRK: Human-Robot-Collaboration

Target group
Planner, construction engineers, programmers, commissioning engineers, project managers and safety experts

Course goals
Insight into machine safety with the focus on MRK applications

Contents
- Definition and rules on the subject of MRK
  (DIN 101218-1 and-2 and ISO/TS15066)
- Carrying out risk assessments according to DIN 12100
- Carrying out pressure and force measurements
- Verification and validation of security functions according
  to DIN 13849-1 and 2
- Define the 4 protection principles:
  1. Safety-related monitored standstill;
  2. Manual guidance;
  3. Speed and distance monitoring;
  4. Power and force limitation
- Performance and force measurement with YuMi
- Carrying out force measurements
- Calculation example of a safety function
- Validation

Prerequisites
Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,070 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1 or
   IRC5 YuMi1: YuMi basics
2. SafeMove and EPS / SaveMovePro / MRK
3. **IRC5 Machine Safety**
4. IRC5 PS-S-Adm: SafeMove Administrator
5. Certification safety commissioning engineer

IRC5 PS-S-Adm: SafeMove Administrator

Target group
Programmers, commisioning engineers, plant managers and service personnel, responsible for programming with SafeMove

Course goals
- Testing and acceptance of SafeMove programming
- Access concept and documentation

Contents
- Occupational health and safety
- Over-run principle
- Simulation in RobotStudio
- Testing on a robot
- Managing access rights
- Documentation of the complete safety concept
- Final examination for all courses of the training series: (IRC5 PG1, IRC5 PS-S, IRC5 MS, IRC5 PS-S-Adm)
- Presentation of certificates and permits

Prerequisites
IRC5 PS-S SafeMove or IRC5 PS-SP SafeMove Pro and IRC5 Machine Safety

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1 or
   IRC5 YuMi1: YuMi basics
2. SafeMove and EPS / SaveMovePro / MRK
3. IRC5 Machine Safety
4. **IRC5 PS-S-Adm: SafeMove Administrator**
5. Certification safety commissioning engineer

Certification safety commissioning engineer

The technical rules for operational safety (TRBS) indicate the state of the Engineering, occupational medicine and hygiene, as well as other scientific findings for the provision and use of work equipment and for the operation of equipment in need of monitoring.

These TRBS concretized the scope and the conditions of the industrial safety regulation. In compliance with the technical rules can the employer assume that the corresponding Requirements of the Regulation are met. If the employer choose another solution then he have to reach the same safety and the same health protection.

Contents
- Final exam for all courses of the training series
  (IRC5 PG1, IRC5 PS-S, IRC5 Machine Safety, IRC5 PS-S-Adm)
- Award of certificates and IDs IRC5

Note
If the qualified person has not taken any exams for a longer period of time, you must refresh experiences by participating in third party exams and renew their professional knowledge. The technical knowledge is to renew every 5 years.

Prerequisites
- Basic course IRC5 PG1 or IRC5 YuMi 1 and IRC5 PS-Safe Move or SaveMovePro and IRC5 Machine Safety and IRC5 PS-S-Adm SafeMove Administrator
- Computer skills

Information
Course duration: 1 hour
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 250 EUR

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5 PG1: Programming basics 1 or
   IRC5 YuMi1: YuMi basics
2. SafeMove and EPS / SaveMovePro / MRK
3. IRC5 Machine Safety
4. IRC5 PS-S-Adm: SafeMove Administrator
5. **Certification safety commissioning engineer**

IRC5 individual courses

Standard and individual courses on site

Number of days	Price for Monday to Friday	Price for Saturday / Sunday
1	2,440 Euro	3,660 Euro
2	4,880 Euro	7,310 Euro
3	7,320 Euro	
4	9,760 Euro	
5	12,200 Euro	

Each course on the first day from 1.00 pm to the last day at 1.00 pm, approx. 30 hours
Optional: Starts on the first day at 8.00 am if you book an additional half trainer day
Optional: Ends on the last day at 5.00 pm if you book an additional half trainer day

Individual courses in the Friedberg Training Center

Number of days	Price for Monday to Friday	Price for Saturday/Sunday
1	2,440 Euro	3,660 Euro
2	4,880 Euro	7,310 Euro
3	7,320 Euro	
4	9,760 Euro	
5	12,200 Euro	

Painting robot IRC5P
Plant operator training plan

For detailed information about a course module, click on it.

Individual refresher course / advanced course

IRC5P BE-L: Operation

IRC5P BE-L: Operation painting

Target group
Plant operators, mechanical service personnel, application engineers

Course goals
- Independent execution of operating functions
- Switching on and starting up the robot system
- Moving the mechanics with a joystick
- Loading, testing and optimising simple movement programs
- Recognising and rectifying simple faults and service interruptions (e.g. emergency stop)
- Making changes to the painting application

Contents
- Occupational health and safety
- Structure and function of the robot system
- Types of movement in manual and automatic operation
- Monitoring input and output signals
- Loading and saving modules and programs
- Error messages and status report
- Changing the fan geometry data and shift points

Prerequisites
None

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,590 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5P BE-L: Operation**
2. Individual refresher course / advanced course

Painting robot IRC5P
Plant manager training plan

For detailed information about a course module, click on it.

```
                                    ┌──────────────────────────┐
                                    │  Individual refresher    │
                                    │  course / advanced course│
                                    └──────────────────────────┘
                                         ▲
                              ┌──────────────────────┐
                              │        Safety        │
                              └──────────────────────┘
                                   ▲
                     ┌──────────────────────────┐
                     │  Special programming as   │
                     │        required           │
                     └──────────────────────────┘
                          ▲
            ┌──────────────────────────┐
            │  Application engineering  │
            │   courses on Painting     │
            └──────────────────────────┘
                 ▲
   ┌──────────────────────────┐
   │     IRC5P PG1-L:          │
   │  Programming basics 1     │
   └──────────────────────────┘
```

IRC5P PG1-L: Programming basics 1 Painting

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs
- Changing and / or optimising the application

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Programming with conveyor tracking
- Programming with the processware "Paintware"
- Structure and functioning of the processware "RobView"

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com
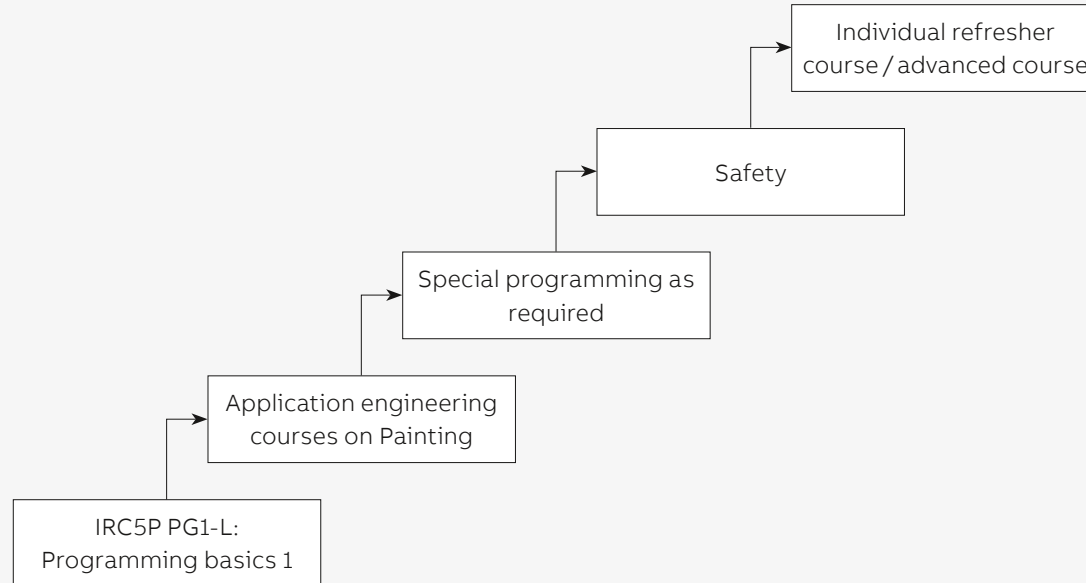
QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5P PG1-L: Programming basics 1**
2. Application engineering courses on Painting
3. Special programming as required
4. Safety
5. Individual refresher course / advanced course

IRC5P APT-L-IPS: Painting – Integrated Process System

Target group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Using the IPS system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Controlling painting processes; maintaining and configuring the control system
- Changing and / or optimising the application
- Independently developing, implementing, testing, optimising and documenting simple application programs

Contents
- Occupational health and safety in dealing with the application
- Architecture of the IPS system
- Explaining and understanding IPS configurations (open / closed loop)
- Extending and optimising the existing IPS configuration
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Extending and optimising the existing IPS configuration
- Parametrisation of controllers
- Calibration and adjustment of sensors
- Performing an IPS software update
- Diagnosis
- Restoring defective systems
- Performing an IPS software update

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com

QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. **Application engineering courses on Painting**
3. Special programming as required
4. Safety
5. Individual refresher course / advanced course

IRC5P APT-L-KA: Painting – Conventional application

Target group
Application mechanics, commissioning engineers, mechanical service personnel

Course goals
- Using the IPS system and controlling the functions
- Performing necessary maintenance, replacing components or worn parts, servicing and error diagnostics
- Making the necessary calibrations on mechanical components
- Making changes to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functions of the conventional painting system
- Recognising and locating faults in the IPS system (RobView)
- Exchanging hardware components and the associated adjustments
- Functional testing of the hardware components
- Performing settings and calibrations
- Using and understanding maintenance instructions
- Performing possible repairs on the hardware components

Prerequisites
Basic course PG1

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,230 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. **Application engineering courses on Painting**
3. Special programming as required
4. Safety
5. Individual refresher course / advanced course

IRC5P APT-L-CBS: Painting – CartridgeBellSystem

Target group
Application mechanics, commissioning engineers, mechanical service personnel

Course goals
- Using the IPS system and controlling the functions
- Performing necessary maintenance, replacing components or worn parts, servicing and error diagnostics
- Making the necessary calibrations on mechanical components
- Making changes to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functions and operating method of the CBS system
- Recognising and locating faults in the IPS system (RobView)
- Exchanging hardware components and the associated adjustments
- Functional testing of the hardware components
- Performing settings and calibrations
- Using and understanding maintenance instructions
- Performing possible repairs on the hardware components

Prerequisites
Basic course PG1

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,230 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. **Application engineering courses on Painting**
3. Special programming as required
4. Safety
5. Individual refresher course / advanced course

IRC5P PS-RS: RobotStudio Paint

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Carrying out and visualising complex control tasks of a robot system with the help of the offline tool RobotStudio
- Writing a program without direct intervention in the robot (offline)

Contents
- Occupational health and safety
- Installation licensing issues
- Work surface functions
- Creating virtual systems
- Integration of geometric data and libraries
- Creation and measurement of tools and work objects
- Establishment of points and paths on CAD objects
- Automatic path generation on curved bodies
- Synchronizing data between the unit and the virtual system
- Integration of the program editor
- Simulation capabilities
- Signal analysis
- Collision checking and position accessibility
- Using external axis (Conveyor)
- Integration and creation of an application with "PowerPac Painting"

Prerequisites
- Basic course PG1
- Computer skills
- Experience with a CAD program

Information
Course duration: 5 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. **Special programming as required**
4. Safety
5. Individual refresher course / advanced course

IRC5P Machine Safety

Target group
Plant managers, maintenance personnel, safety officials, designers, planners

Course goals
Insight into Machine Safety requirements of robotic workstations

Contents
- Overview and classification
- In context: Machinery Directives 2006/42/EC – Product Safety Act
- Insight into: Machinery Directives 2006/42/EC, 1st Appendix
  a) Basic health and safety requirements
  b) Explanation: Machinery – incomplete machinery
  c) EC – Declaration of Conformity – Installation Instructions
  d) Commissioning and start-up of a machine
  e) Applying directives and harmonized standards
  f) Approach to risk assessment
  g) Risk appraisal
  h) Risk evaluation
- Case Study: Robot safety of the latest generation

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
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**QUOTATION
VIA EMAIL**

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. Special programming as required
4. **Safety**
5. Individual refresher course / advanced course

IRC5 MRK: Human-Robot-Collaboration

Target group
Planner, construction engineers, programmers, commissioning engineers, project managers and safety experts

Course goals
Insight into machine safety with the focus on MRK applications

Contents
- Definition and rules on the subject of MRK
  (DIN 101218-1 and-2 and ISO/TS15066)
- Carrying out risk assessments according to DIN 12100
- Carrying out pressure and force measurements
- Verification and validation of security functions according
  to DIN 13849-1 and 2
- Define the 4 protection principles:
  1. Safety-related monitored standstill;
  2. Manual guidance;
  3. Speed and distance monitoring;
  4. Power and force limitation
- Performance and force measurement with YuMi
- Carrying out force measurements
- Calculation example of a safety function
- Validation

Prerequisites
Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,070 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. Special programming as required
4. **Safety**
5. Individual refresher course / advanced course

Painting robot IRC5P
Programmer training plan

For detailed information about a course module, click on it.

```
                                                    ┌─────────────────────────┐
                                                    │  Individual refresher   │
                                                    │ course / advanced course│
                                                    └─────────────────────────┘
                                                          ▲
                                          ┌─────────────────────────┐
                                          │     IRC5P PG2-L:        │
                                          │  Programming basics 2   │
                                          └─────────────────────────┘
                                      ▲
                            ┌─────────────────────┐
                            │       Safety        │
                            └─────────────────────┘
                        ▲
              ┌─────────────────────────┐
              │    IRC5P PS-RS:         │
              │  RobotStudio Paint      │
              └─────────────────────────┘
          ▲
┌─────────────────────────┐
│  Special programming    │
│     as required         │
└─────────────────────────┘
      ▲
┌─────────────────────────┐
│ Application engineering │
│  courses on Painting    │
└─────────────────────────┘
  ▲
┌─────────────────────────┐
│     IRC5P PG1-L:        │
│  Programming basics 1   │
└─────────────────────────┘
```

IRC5P PG1-L: Programming basics 1 Painting

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs
- Changing and / or optimising the application

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Programming with conveyor tracking
- Programming with the processware "Paintware"
- Structure and functioning of the processware "RobView"

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
roboterservice.schulung@de.abb.com
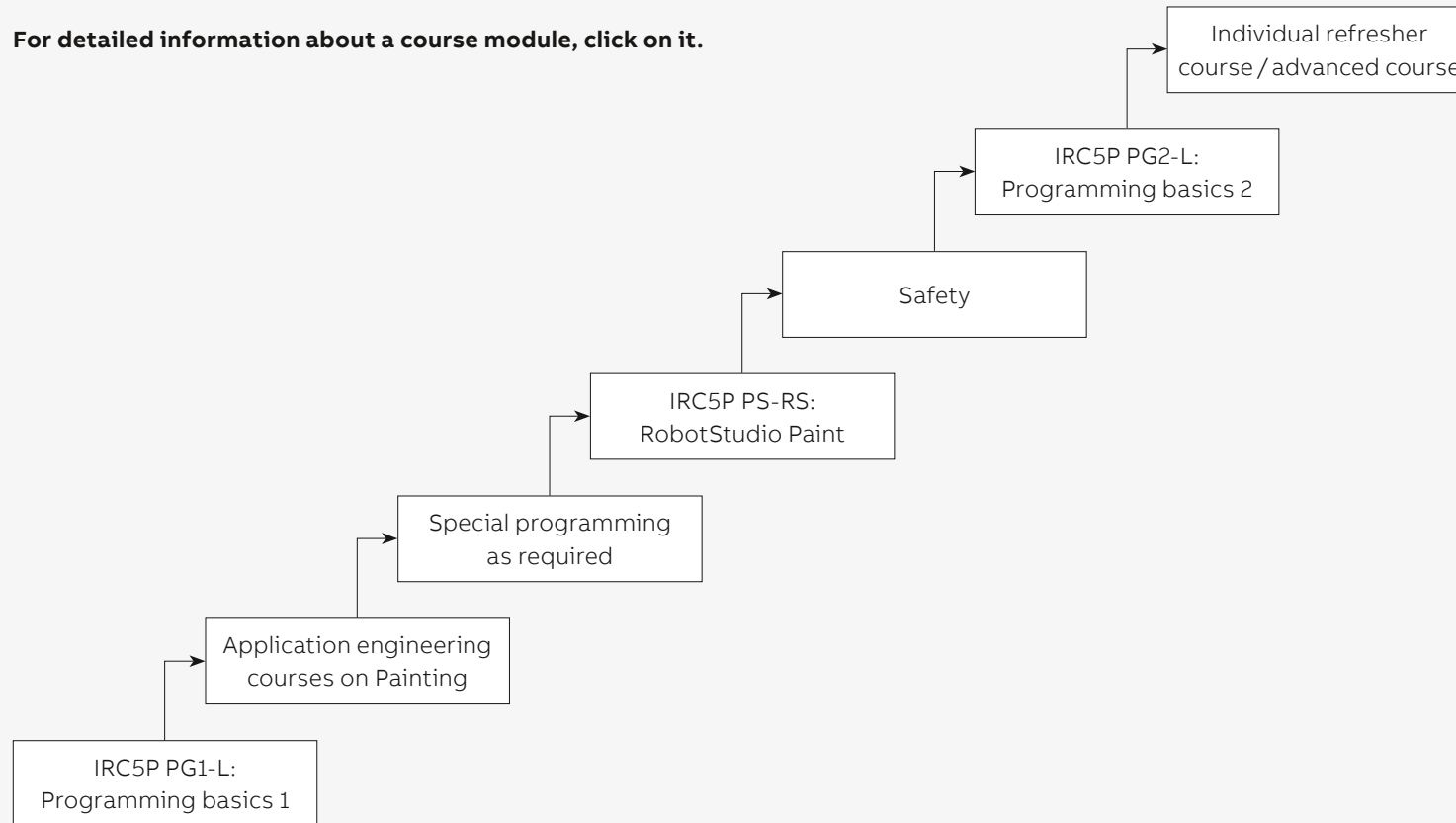
QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5P PG1-L: Programming basics 1**
2. Application engineering courses on Painting
3. Special programming as required
4. IRC5P PS-RS: RobotStudio Paint
5. Safety
6. IRC5P PG2-L: Programming basics 2
7. Individual refresher course / advanced course

IRC5P APT-L-IPS: Painting – Integrated Process System

Target group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Using the IPS system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Controlling painting processes; maintaining and configuring the control system
- Changing and / or optimising the application
- Independently developing, implementing, testing, optimising and documenting simple application programs

Contents
- Occupational health and safety in dealing with the application
- Architecture of the IPS system
- Explaining and understanding IPS configurations (open / closed loop)
- Extending and optimising the existing IPS configuration
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Extending and optimising the existing IPS configuration
- Parametrisation of controllers
- Calibration and adjustment of sensors
- Performing an IPS software update
- Diagnosis
- Restoring defective systems
- Performing an IPS software update

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. **Application engineering courses on Painting**
3. Special programming as required
4. IRC5P PS-RS: RobotStudio Paint
5. Safety
6. IRC5P PG2-L: Programming basics 2
7. Individual refresher course / advanced course

No courses are currently provided in this category.

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. **Special programming as required**
4. IRC5P PS-RS: RobotStudio Paint
5. Safety
6. IRC5P PG2-L: Programming basics 2
7. Individual refresher course / advanced course

IRC5P PS-RS: RobotStudio Paint

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Carrying out and visualising complex control tasks of a robot system with the help of the offline tool RobotStudio
- Writing a program without direct intervention in the robot (offline)

Contents
- Occupational health and safety
- Installation licensing issues
- Work surface functions
- Creating virtual systems
- Integration of geometric data and libraries
- Creation and measurement of tools and work objects
- Establishment of points and paths on CAD objects
- Automatic path generation on curved bodies
- Synchronizing data between the unit and the virtual system
- Integration of the program editor
- Simulation capabilities
- Signal analysis
- Collision checking and position accessibility
- Using external axis (Conveyor)
- Integration and creation of an application with "PowerPac Painting"

Prerequisites
- Basic course PG1
- Computer skills
- Experience with a CAD program

Information
Course duration: 5 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. Special programming as required
4. **IRC5P PS-RS: RobotStudio Paint**
5. Safety
6. IRC5P PG2-L: Programming basics 2
7. Individual refresher course / advanced course

IRC5P Machine Safety

Target group
Plant managers, maintenance personnel, safety officials, designers, planners

Course goals
Insight into Machine Safety requirements of robotic workstations

Contents
- Overview and classification
- In context: Machinery Directives 2006/42/EC – Product Safety Act
- Insight into: Machinery Directives 2006/42/EC, 1st Appendix
  a) Basic health and safety requirements
  b) Explanation: Machinery – incomplete machinery
  c) EC – Declaration of Conformity – Installation Instructions
  d) Commissioning and start-up of a machine
  e) Applying directives and harmonized standards
  f) Approach to risk assessment
  g) Risk appraisal
  h) Risk evaluation
- Case Study: Robot safety of the latest generation

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. Special programming as required
4. IRC5P PS-RS: RobotStudio Paint
5. **Safety**
6. IRC5P PG2-L: Programming basics 2
7. Individual refresher course / advanced course

IRC5 MRK: Human-Robot-Collaboration

Target group
Planner, construction engineers, programmers, commissioning engineers, project managers and safety experts

Course goals
Insight into machine safety with the focus on MRK applications

Contents
- Definition and rules on the subject of MRK (DIN 101218-1 and-2 and ISO/TS15066)
- Carrying out risk assessments according to DIN 12100
- Carrying out pressure and force measurements
- Verification and validation of security functions according to DIN 13849-1 and 2
- Define the 4 protection principles:
  1. Safety-related monitored standstill;
  2. Manual guidance;
  3. Speed and distance monitoring;
  4. Power and force limitation
- Performance and force measurement with YuMi
- Carrying out force measurements
- Calculation example of a safety function
- Validation

Prerequisites
Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,070 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. Special programming as required
4. IRC5P PS-RS: RobotStudio Paint
5. **Safety**
6. IRC5P PG2-L: Programming basics 2
7. Individual refresher course / advanced course

IRC5P PG2-L: Programming basics 2 – Painting

Target group
Programmers, plant managers, project managers, planners, commissioning engineers

Course goals
- Using the options provided by control for the painting application
- Devising and testing concepts for the optimum use of the system or for solving application tests
- Operating and learning the editing and testing options on the robot in RobotStudio (online functionality), RobView and with virtual control
- The application of a programming tool for editing and testing programs on the computer
- Connecting material handling technology to the robot system
- Programming of manufacturing processes with material handling synchronisation

Contents
- Occupational health and safety
- Conveyor tracking: Connecting the additional hardware components such as encoder module, encoder hardware and start signal system, determining the associated parameters and subsequent functional testing
- Programming with material handling synchronisation, reflecting individual positions and whole routines
- Programming world zones for surveying the working area and defining home zones
- Booting up the system (installation of the operating system)
- Calibrating the measurement system
- Interrupt and multitasking
- Further programming

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. Special programming as required
4. IRC5 PS-RS: RobotStudio
5. Safety
6. **IRC5P PG2-L: Programming basics 2**
7. Individual refresher course / advanced course

Painting robot IRC5P
Mechanical service personnel training plan

For detailed information about a course module, click on it.

```
                    ┌─────────────────────────┐
                    │  Individual refresher    │
                ┌──▶│  course / advanced course│
                │   └─────────────────────────┘
        ┌───────┴──────────┐
     ┌─▶│  Mechanics courses │
     │  └────────────────────┘
 ┌───┴──────────┐
 │  IRC5P BE-L:  │
 │  Operation    │
 └───────────────┘
```

IRC5P BE-L: Operation painting

Target group
Plant operators, mechanical service personnel, application engineers

Course goals
- Independent execution of operating functions
- Switching on and starting up the robot system
- Moving the mechanics with a joystick
- Loading, testing and optimising simple movement programs
- Recognising and rectifying simple faults and service interruptions (e.g. emergency stop)
- Making changes to the painting application

Contents
- Occupational health and safety
- Structure and function of the robot system
- Types of movement in manual and automatic operation
- Monitoring input and output signals
- Loading and saving modules and programs
- Error messages and status report
- Changing the fan geometry data and shift points

Prerequisites
None

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,590 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. **IRC5P BE-L: Operation**
2. Mechanics courses
3. Individual refresher course / advanced course

IRC5P ME: Mechanics course on robot mechanics IRB 5400-12

Target group
Mechanical service personnel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 4 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

Contact
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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5P BE-L: Operation
2. **Mechanics courses**
3. Individual refresher course / advanced course

IRC5P ME: Mechanics course on robot mechanics IRB 5500

Target group
Mechanical service personnel

Course goals
- Rapid diagnosis of the cause of the error can minimize downtime
- Replacing defective parts in good time
- Maintaining the robot mechanics in accordance with regulations

Contents
- Occupational health and safety
- Backup
- Explanation and functioning of the robot mechanics
- Disassembly and assembly of sub-assemblies and individual parts
- Calibrating robots (fine-calibration)
- Use of special tools
- Testing the robot system
- Performing maintenance and adjustment work

Prerequisites
- Operating course BE or basic course PG1
- Bring your own protective shoes and work clothes

Information
Course duration: 4 days
Number of participants: 3–4 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P BE-L: Operation
2. **Mechanics courses**
3. Individual refresher course / advanced course

Painting robot IRC5P
Electrical equipment service personnel training plan

For detailed information about a course module, click on it.

Individual refresher course / advanced course

Safety

IRC5P PS-RS:
RobotStudio Paint

IRC5P SD:
Faults and Diagnostics

Application engineering
courses on Painting

IRC5P SE-L:
Electrical equipment course

IRC5P PG1-L:
Programming basics 1

IRC5P PG1-L: Programming basics 1 Painting

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs
- Changing and / or optimising the application

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Programming with conveyor tracking
- Programming with the processware "Paintware"
- Structure and functioning of the processware "RobView"

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3 – 6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
Phone: +49 60 31 85-233
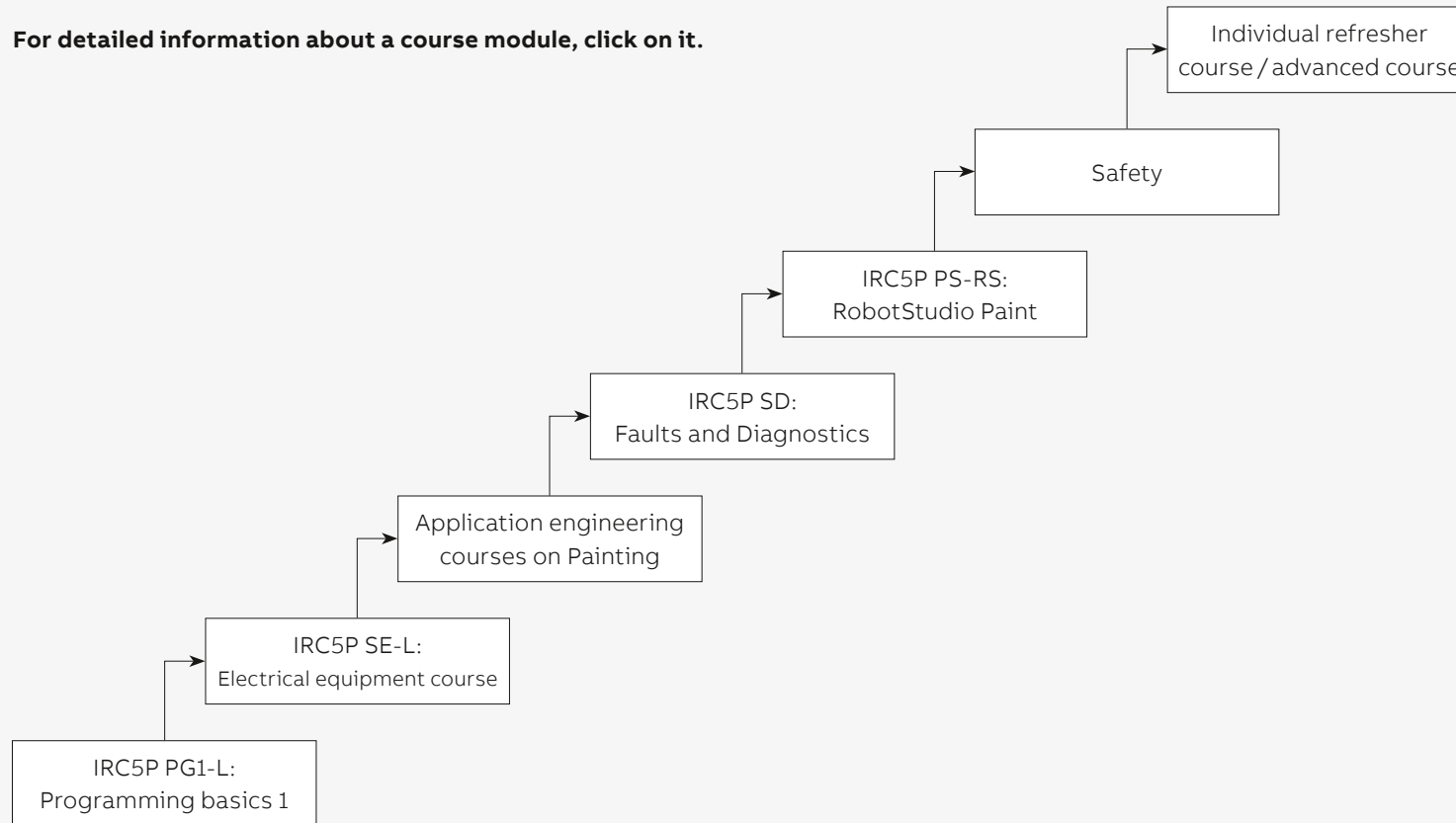roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5P PG1-L: Programming basics 1**
2. IRC5P SE-L: Electrical equipment course
3. Application engineering courses on Painting
4. IRC5P SD: Faults and Diagnostics
5. Special programming as required
6. Safety
7. Individual refresher course / advanced course

IRC5P SE-L: Electrical equipment course

Target group
Commisioning engineers, maintenance technicians electrics

Course goals
- System overview
- Locating system faults
- Rapid diagnosis of the cause of the error can minimize downtime

Contents
- Occupational health and safety
- Detailed explanation of structure and working method of the control of the robot, particularly the ex protection
- Program errors and how to recognize them
- System parameters: Meaning, change, backup
- Checking calibration, updating revolution counter, fine-calibration
- Working with circuit diagrams
- Practical exercises for error recognition, systematic error diagnostics with the help of suitable software (RobView, RobotStudio, terminal program)
- Producing a system, installation of the control software
- Loading and executing test programs

Prerequisites
- Basic course PG1
- Computer skills
- Electrical engineering qualification

Information
Course duration: 5 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,810 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. **IRC5P SE-L: Electrical equipment course**
3. Application engineering courses on Painting
4. IRC5P SD: Faults and Diagnostics
5. Special programming as required
6. Safety
7. Individual refresher course / advanced course

IRC5P APT-L-IPS: Painting – Integrated Process System

Target group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Using the IPS system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Controlling painting processes; maintaining and configuring the control system
- Changing and / or optimising the application
- Independently developing, implementing, testing, optimising and documenting simple application programs

Contents
- Occupational health and safety in dealing with the application
- Architecture of the IPS system
- Explaining and understanding IPS configurations (open / closed loop)
- Extending and optimising the existing IPS configuration
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Extending and optimising the existing IPS configuration
- Parametrisation of controllers
- Calibration and adjustment of sensors
- Performing an IPS software update
- Diagnosis
- Restoring defective systems
- Performing an IPS software update

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. IRC5P SE-L: Electrical equipment course
3. **Application engineering courses on Painting**
4. IRC5P SD: Faults and Diagnostics
5. Special programming as required
6. Safety
7. Individual refresher course / advanced course

IRC5P SD: Faults and Diagnostics

Target group
Commisioning engineers, maintenance technicians electrics

Course goals
- Expansion of knowledge about systematic troubleshooting
- Application of the diagnostic facilities of the IRC5 controller
- Ordered methods of combating faults

Contents
- Occupational health and safety
- Refresher, deepening and expanding the basics from the service course (SE) and the IPS course (APT-L-IPS)
- Develop a fault and analysis strategy for more efficient troubleshooting based on case studies
- Plan and structure procedures based on the troubleshooting method (MeFes)
- Aftercare and avoidance of future faults
- Use measurement tools to perform diagnostics (e.g. oscilloscopes, bus testers, etc.)
- Using ABB supplied software and recommendations for using external software

Prerequisites
- Participation in a IRC5 SE course and the IPS course (APT-L-IPS)
- Electro-technical training
- Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,010 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. IRC5P SE-L: Electrical equipment course
3. Application engineering courses on Painting
4. **IRC5P SD: Faults and Diagnostics**
5. Special programming as required
6. Safety
7. Individual refresher course / advanced course

IRC5P PS-RS: RobotStudio Paint

Target group
Planners, commisioning engineers, programmers, project managers

Course goals
• Carrying out and visualising complex control tasks of a robot system with the help of the offline tool RobotStudio
• Writing a program without direct intervention in the robot (offline)

Contents
• Occupational health and safety
• Installation licensing issues
• Work surface functions
• Creating virtual systems
• Integration of geometric data and libraries
• Creation and measurement of tools and work objects
• Establishment of points and paths on CAD objects
• Automatic path generation on curved bodies
• Synchronizing data between the unit and the virtual system
• Integration of the program editor
• Simulation capabilities
• Signal analysis
• Collision checking and position accessibility
• Using external axis (Conveyor)
• Integration and creation of an application with "PowerPac Painting"

Prerequisites
• Basic course PG1
• Computer skills
• CAD skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. IRC5P SE-L: Electrical equipment course
3. Application engineering courses on Painting
4. **IRC5P SD: Faults and Diagnostics**
5. Special programming as required
6. Safety
7. Individual refresher course / advanced course

IRC5P Machine Safety

Target group
Plant managers, maintenance personnel, safety officials, designers, planners

Course goals
Insight into Machine Safety requirements of robotic workstations

Contents
- Overview and classification
- In context: Machinery Directives 2006/42/EC – Product Safety Act
- Insight into: Machinery Directives 2006/42/EC, 1st Appendix
  a) Basic health and safety requirements
  b) Explanation: Machinery – incomplete machinery
  c) EC – Declaration of Conformity – Installation Instructions
  d) Commissioning and start-up of a machine
  e) Applying directives and harmonized standards
  f) Approach to risk assessment
  g) Risk appraisal
  h) Risk evaluation
- Case Study: Robot safety of the latest generation

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,760 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. IRC5P SE-L: Electrical equipment course
3. Application engineering courses on Painting
4. IRC5P SD: Faults and Diagnostics
5. Special programming as required
6. **Safety**
7. Individual refresher course / advanced course

IRC5 MRK: Human-Robot-Collaboration

Target group
Planners, construction engineers, programmers, commissioning engineers, project managers and safety experts

Course goals
Insight into machine safety with the focus on MRK applications

Contents
- Definition and rules on the subject of MRK
  (DIN 101218-1 and-2 and ISO/TS15066)
- Carrying out risk assessments according to DIN 12100
- Carrying out pressure and force measurements
- Verification and validation of security functions according
  to DIN 13849-1 and 2
- Define the 4 protection principles:
  1. Safety-related monitored standstill;
  2. Manual guidance;
  3. Speed and distance monitoring;
  4. Power and force limitation
- Performance and force measurement with YuMi
- Carrying out force measurements
- Calculation example of a safety function
- Validation

Prerequisites
Computer skills

Information
Course duration: 3 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,070 EUR / participant

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QUOTATION VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. IRC5P SE-L: Electrical equipment course
3. Application engineering courses on Painting
4. IRC5P SD: Faults and Diagnostics
5. Special programming as required
6. **Safety**
7. Individual refresher course / advanced course

Painting robot IRC5P
Application engineer training plan

For detailed information about a course module, click on it.

Individual refresher course / advanced course

Special programming as required

Application engineering courses on Painting

IRC5P PG1-L: Programming basics 1

IRC5P PG1-L: Programming basics 1 Painting

Target group
Programmers, plant managers, project managers, planners, maintenance technicians electrics

Course goals
- Independent execution of operating functions
- Independently developing, implementing, testing, optimising and documenting simple movement programs
- Changing and / or optimising the application

Contents
- Occupational health and safety
- Structure and function of the robot system, dialogue concept of FlexPendant / RobotStudio
- RAPID program structure
- Types of movement in manual and automatic operation
- Writing simple movement programs
- Monitoring input and output signals
- Measuring tool and work object
- Loading and saving modules and programs and system parameters
- Error messages and status report
- Backup
- Programming with conveyor tracking
- Programming with the processware "Paintware"
- Structure and functioning of the processware "RobView"

Prerequisites
Computer skills

Information
Course duration: 5 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,540 EUR / participant

Contact
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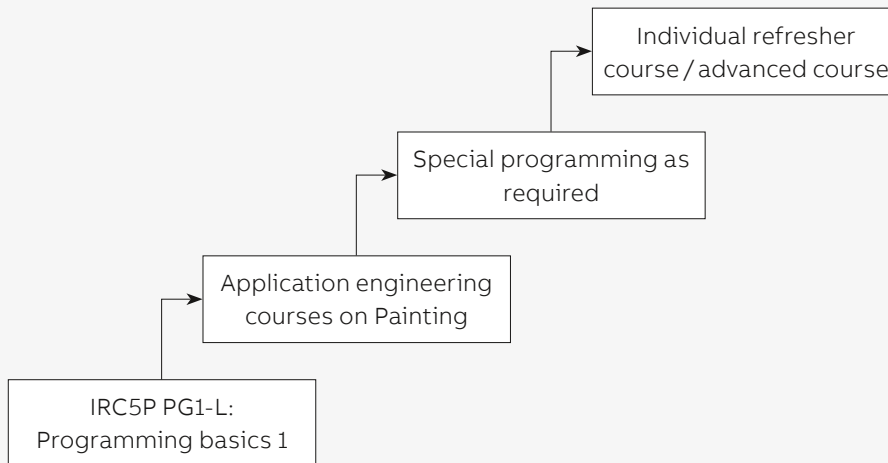
QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5P PG1-L: Programming basics 1**
2. Application engineering courses on Painting
3. Special programming as required
4. Individual refresher course / advanced course

IRC5P APT-L-IPS: Painting – Integrated Process System

Target group
Programmers, plant managers, project managers, planners, commissioning engineers, maintenance technicians electrics

Course goals
- Using the IPS system and controlling the functions
- Making the necessary calibrations after exchanging components or when using new application media
- Controlling painting processes; maintaining and configuring the control system
- Changing and / or optimising the application
- Independently developing, implementing, testing, optimising and documenting simple application programs

Contents
- Occupational health and safety in dealing with the application
- Architecture of the IPS system
- Explaining and understanding IPS configurations (open / closed loop)
- Extending and optimising the existing IPS configuration
- Getting to know and using software programs that support the application (RobView, terminal program, FTP programs)
- Extending and optimising the existing IPS configuration
- Parametrisation of controllers
- Calibration and adjustment of sensors
- Performing an IPS software update
- Diagnosis
- Restoring defective systems
- Performing an IPS software update

Prerequisites
- Basic course PG1
- Computer skills

Information
Course duration: 4 days
Number of participants: 4 persons
Maximum: 4 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,650 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. **Application engineering courses on Painting**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5P APT-L-KA: Painting – Conventional application

Target group
Application mechanics, commissioning engineers, mechanical service personnel

Course goals
- Using the IPS system and controlling the functions
- Performing necessary maintenance, replacing components or worn parts, servicing and error diagnostics
- Making the necessary calibrations on mechanical components
- Making changes to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functions of the conventional painting system
- Recognising and locating faults in the IPS system (RobView)
- Exchanging hardware components and the associated adjustments
- Functional testing of the hardware components
- Performing settings and calibrations
- Using and understanding maintenance instructions
- Performing possible repairs on the hardware components

Prerequisites
Basic course PG1

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,230 EUR / participant

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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. **Application engineering courses on Painting**
3. Special programming as required
4. Individual refresher course / advanced course

IRC5P APT-L-CBS: Painting – CartridgeBellSystem

Target group
Application mechanics, commissioning engineers, mechanical service personnel

Course goals
- Using the IPS system and controlling the functions
- Performing necessary maintenance, replacing components or worn parts, servicing and error diagnostics
- Making the necessary calibrations on mechanical components
- Making changes to the application

Contents
- Occupational health and safety in dealing with the application
- Getting to know the functions and operating method of the CBS system
- Recognising and locating faults in the IPS system (RobView)
- Exchanging hardware components and the associated adjustments
- Functional testing of the hardware components
- Performing settings and calibrations
- Using and understanding maintenance instructions
- Performing possible repairs on the hardware components

Prerequisites
Basic course PG1

Information
Course duration: 3 days
Number of participants: 3 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,230 EUR / participant

Contact
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. **Application engineering courses on Painting**
3. Special programming as required
4. Individual refresher course / advanced course

No courses are currently provided in this category.

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. **Special programming as required**
4. Individual refresher course / advanced course

IRC5P PS-RS: RobotStudio Paint

Target group
Planners, commissioning engineers, programmers, project managers

Course goals
- Carrying out and visualising complex control tasks of a robot system with the help of the offline tool RobotStudio
- Writing a program without direct intervention in the robot (offline)

Contents
- Occupational health and safety
- Installation licensing issues
- Work surface functions
- Creating virtual systems
- Integration of geometric data and libraries
- Creation and measurement of tools and work objects
- Establishment of points and paths on CAD objects
- Automatic path generation on curved bodies
- Synchronizing data between the unit and the virtual system
- Integration of the program editor
- Simulation capabilities
- Signal analysis
- Collision checking and position accessibility
- Using external axis (Conveyor)
- Integration and creation of an application with "PowerPac Painting"

Prerequisites
- Basic course PG1
- Computer skills
- Experience with a CAD program

Information
Course duration: 5 days
Number of participants: 3–6 persons
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 2,280 EUR / participant

Contact
Phone: +49 60 31 85-233
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QUOTATION
VIA EMAIL

Overview of training plan
1. IRC5P PG1-L: Programming basics 1
2. Application engineering courses on Painting
3. **Special programming as required**
4. Individual refresher course / advanced course

Industrial robot IRC5P
Manager training plan

For detailed information about a course module, click on it.

IRC5P:
Introductory course

IRC5P: Introductory course – Paint robots

Target group
Managers, planners, administrative staff

Course goals
- Getting to know the fields of application for robots
- Perform operating functions independently
- Manual operation
- Loading and testing programs
- Insight into the fields of work of plant operators, programmers and maintenance engineers
- Getting to know the way personnel and procedures cooperate

Contents
- Occupational health and safety
- Robot applications in production practice
- Configuration and function of a robot system
- Types of movement in manual and automatic mode
- Control of inputs and outputs
- Loading and saving modules and programs
- Error messages and situation description
- Documentation and technical support from ABB
- Contact persons and procedures for selected issues

Prerequisites
None

Information
Course duration: 2 days
Number of participants: 3–6 persons
Maximum: 3 persons per training robot
Dates: Subject to agreement
Venue: Training Center in Friedberg / Hessen
Price: 1,010 EUR / participant

Kontakt
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roboterservice.schulung@de.abb.com

QUOTATION VIA EMAIL

Overview of training plan
1. **IRC5P: Introductory course**

IRC5P individual courses

Standard and individual courses on site

Number of days	Price for Monday to Friday	Price for Saturday / Sunday
1	2,590 Euro	3,900 Euro
2	5,180 Euro	7,790 Euro
3	7,770 Euro	
4	10,360 Euro	
5	12,950 Euro	

Each course on the first day from 1.00 pm to the last day at 1.00 pm, approx. 30 hours
Optional: Starts on the first day at 8.00 am if you book an additional half trainer day
Optional: Ends on the last day at 5.00 pm if you book an additional half trainer day

Individual courses in the Friedberg Training Center

Number of days	Price for Monday to Friday	Price for Saturday/Sunday
1	2,590 Euro	3,900 Euro
2	5,180 Euro	7,790 Euro
3	7,770 Euro	
4	10,360 Euro	
5	12,950 Euro	

S4C+ individual courses

Standard and individual courses on site

Number of days	Price for Monday to Friday	Price for Saturday / Sunday
1	2,440 Euro	3,660 Euro
2	4,880 Euro	7,310 Euro
3	7,320 Euro	
4	9,760 Euro	
5	12,200 Euro	

Each course on the first day from 1.00 pm to the last day at 1.00 pm, approx. 30 hours
Optional: Starts on the first day at 8.00 am if you book an additional half trainer day
Optional: Ends on the last day at 5.00 pm if you book an additional half trainer day

Individual courses in the Friedberg Training Center

Number of days	Price for Monday to Friday	Price for Saturday/Sunday
1	2,440 Euro	3,660 Euro
2	4,880 Euro	7,310 Euro
3	7,320 Euro	
4	9,760 Euro	
5	12,200 Euro	

S4P+ individual courses

Standard and individual courses on site

Number of days	Price for Monday to Friday	Price for Saturday / Sunday
1	2,590 Euro	3,900 Euro
2	5,180 Euro	7,790 Euro
3	7,770 Euro	
4	10,360 Euro	
5	12,950 Euro	

Each course on the first day from 1.00 pm to the last day at 1.00 pm, approx. 30 hours
Optional: Starts on the first day at 8.00 am if you book an additional half trainer day
Optional: Ends on the last day at 5.00 pm if you book an additional half trainer day

Individual courses in the Friedberg Training Center

Number of days	Price for Monday to Friday	Price for Saturday/Sunday
1	2,590 Euro	3,900 Euro
2	5,180 Euro	7,790 Euro
3	7,770 Euro	
4	10,360 Euro	
5	12,950 Euro	

Courses	Duration (days)	Price (Euro)
Industry robot IRC5		
IRC5 Introductory course – Industrial robots	2	1,010
IRC5 FÜ: Direction in production and maintenance	3	2,010
IRC5 BE: Operating	3	1,380
IRC5 BE-S: Operation Shielded Arc Welding	5	2,650
IRC5 PG1: Programming basics 1	5	2,170
IRC5 PG1: Programming basics 1 Express	4	2,070
IRC5 PG2: Programming basics 2	5	2,280
IRC5 PG3: Programming basics 3	5	2,390
IRC5 YuMi1: YuMi basics	5	2,280
IRC5 YuMi2: YuMi Advanced	5	2,390
IRC5 Change-over Workshop: S4C+ Upgrade	3,5	1,910
IRC5 Upgrade Workshop: Robot specialists	5	2,650
IRC5 APT-IDFPS-B: Sealing Basics	4	2,540
IRC5 APT-IDFPS-SE: Sealing Elektric	4	2,540
IRC5 APT-IDFPS-ME: Sealing Mechanic	3	2,010
IRC5 APT-IDFPG-B: Gluing Basics	4	2,540
IRC5 APT-IDFPG-SE: Gluing Elektric	4	2,540
IRC5 APT-IDFPG-ME: Gluing Mechanic	3	2,010
IRC5 APT-P: Spot welding	2	1,480
IRC5 APT-RB: Roller beading	3	2,010
IRC5 APT-S1: Shielded arc welding 1	3	2,010

Courses	Duration (days)	Price (Euro)
IRC5 APT-S2: Shielded arc welding 2	5	2,760
IRC5 PS-A: Plant operation	4	2,540
IRC5 PS-C: Conveyor Tracking	3	2,010
IRC5 PS-EE: EnergyEfficiency	2,5	1,700
IRC5 PS-FCM: Force Control for Machining	4	2,540
IRC5 PS-I: Initiation	5	2,760
IRC5 PS-IV: Integrated Vision	4	2,760
IRC5 PS-M: Multitasking	4	2,540
IRC5 PS-MIG: Migration	3	2,010
IRC5 PS-MMV: MultiMove	5	2,760
IRC5 PS-PM: PickMaster 3 Basics	5	2,760
IRC5 PS-PN: ProfiNet	3	2,010
IRC5 PS-RS-Online: RobotStudio Online	3	1,910
IRC5 PS-RS1: RobotStudio 1	5	2,280
IRC5 PS-RS2: RobotStudio 2	5	2,330
IRC5 PS-RS-AWPP: RobotStudio ArcWelding PowerPac	3	2,010
IRC5 PS-RWMT: RobotWare Machine Tending	5	2,760
IRC5 PS-S+EPS: SafeMove and EPS	4	2,540
IRC5 PS-S-Adm: SafeMove Administrator	3	2,010
IRC5 PS-SP: SafeMovePro	5	2,760
IRC5 PS-SPS-S7: Step 7	5	2,760
IRC5 PS-X1: Programming external axes	3	2,010
IRC5 PS-X2: Configuring external axes	3	2,010
IRC5 PS-X3: Trimming external axes	2,5	1,700

Courses	Duration (days)	Price (Euro)
IRC5 PS-YuMi:	3	2,010
IRC5 Machine Safety	4	2,540
IRC5 MRK: Human-Robot-Collaboration	3	2,070
IRC5 SE: Electrical appliances course	5	2,650
IRC5 SD: Fault and Diagnostics	3	2,120
IRC5 ME 120: Mechanics	3	2,120
IRC5 ME 140: Mechanics	3	2,120
IRC5 ME 1200: Mechanics	3	2,120
IRC5 ME 1600: Mechanics	3	2,120
IRC5 ME 1600ID: Mechanics	3	2,120
IRC5 ME 2400: Mechanics	3	2,120
IRC5 ME 2600: Mechanics	3	2,120
IRC5 ME 2600ID: Mechanics	3	2,120
IRC5 ME 360: Mechanics	3	2,120
IRC5 ME 4400: Mechanics	4	2,650
IRC5 ME 4400 FP: Mechanics	4	2,650
IRC5 ME 4600: Mechanics	4	2,650
IRC5 ME 4600 FP: Mechanics	4	2,650
IRC5 ME 6640: Mechanics	5	3,070
IRC5 ME 6640 FP: Mechanics	5	3,070
IRC5 ME 6700: Mechanics	5	3,070
IRC5 ME FP: Mechanics	2	1,480
IRC5 Kal	2	1,480
Certification safety commissioning engineer	1 hour	270
IRC5 Individual	1	2,440

Courses	Duration (days)	Price (Euro)
Painting robot IRC5P		
IRC5P Introductory course – Paint robots	2	1,010
IRC5P BE-L: Operating painting	3	1,590
IRC5P PG1-L: Programming basics 1 for painting	5	2,540
IRC5P PG2-L: Programming basics 2 for painting	5	2,650
IRC5P APT-L-IPS: Painting – Integrated Process System	4	2,650
IRC5P APT-L-CBS: Painting – CartridgeBellSystem	3	2,230
IRC5P APT-L-KA: Painting – Conventional application	3	2,230
IRC5P PS-RS: RobotStudio Paint	5	2,280
IRC5P MachineSafety	5	2,760
IRC5P SE-L: Electrical appliances	5	2,810
IRC5P SD: Fault and Diagnostics	3	2,010
IRC5P ME 5400: Mechanics	4	2,650
IRC5P ME 5500: Mechanics	4	2,650
IRC5P Individual	1	2,590
Industrial robot S4C+		
S4C+ Individual	1	2,440
Paint robot S4P+		
S4P+ Individual	1	2,590

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General course conditions of the ABB Training Center Friedberg

**ABB Automation GmbH
Business Line Robotics
Grüner Weg 6, 61169 Friedberg, Germany**

1   General remarks

1.1   "Customer" refers to the business person in whose name the seminar was booked.

1.2   "Participant" refers to the natural person who is registered for the seminar or is taking part in the seminar.

1.3   Insofar as these conditions include obligations of the participant, the customer for whom the participant is taking part is completely responsible for ensuring their fulfilment.

1.4   For the course on servicing electrical appliances, as well as for certain individual courses (depending on their requirements), the customer must have a professional electro-technical qualification.

1.5   Participants of mechanics courses or combined operation/mechanics courses must bring their own protective clothing (protective shoes and work clothes).

1.6   The customer is aware that without the prerequisites specified in the seminar programme, the learning goal of a seminar is difficult or impossible to achieve. The customer shall therefore ensure that their appointed participant fulfils these prerequisites.

1.7   If a course participant significantly hinders the progress of the course for the aforementioned reasons, ABB reserves the right to ban the course participant from the course for the sake of other course participants.

1.8   For courses that require "PC skills" as a prerequisite, the following will apply Requirements for course participants: Safe handling of Windows (using the mouse, using the Windows Explorer, creating folders, opening programs, opening context menus, working with the keyboard)

2   Registration for the seminars and course venue

2.1   For organisational reasons, the registration must be made in writing. The following information is required: First and last names, as well as complete address with telephone and fax number of the participant, complete name of the customer's company (if it deviates from that of the participant), name of the seminar and the seminar date.

2.2   Unless stated otherwise in the course description and confirmation, the seminars are held in the Training Center of ABB Automation GmbH, Business Line Robotics in Grüner Weg 6, 61169 Friedberg, Germany.

2.3   Insofar as the parties agree that the training shall be held on the customer's premises, the "Course conditions for courses on the customer's premises" take priority over these conditions.

2.4   Upon registration, the terms and conditions of business become part of the contract and are acknowledged as legally binding.

3   Data protection

3.1   The customer grants his consent for his data to be processed insofar as this serves the purpose of the legal relationship.

4 Course times

4.1 The course times are as follows: We begin at 10:00 am on the first day. Seminars end daily at 4:30 pm, except on Friday which ends at 1:30 pm. Half-day courses end at 12:30 pm. Deviating from this, courses start at Customer on the first day at 12.30 pm.

5 Confirmation

5.1 ATG/R confirms the receipt of the registration/order (confirmation of receipt) with a registration confirmation. Registrations are dealt with in the order they are received.

5.2 Registrations and registration cancellations are only processed in Friedberg by the training department.

6 Seminar prices

6.1 Please refer to the current price list for the prices. The prices are net prices and are excluding the respectively valid value added tax.

6.2 ATG/R seminar prices include the costs for the use of the required technical equipment and accompanying material. The scope of service is specified in the seminar description or, for customer-specific training courses, in the individually defined agreements.

6.3 Other costs in connection with the seminar and the seminar participation (in particular travel and overnight costs) shall be borne by the participant or the customer. Failure to participate or only partial participation in a seminar does not entitle the participant to a price reduction.

7 Conditions of payment

7.1 The seminar price must be paid in full after the seminar and on receipt of the ATG/R invoice.

8 Customer cancellation

8.1 Cancellations of seminars must be made in writing. In the event of cancellation up to six weeks before the seminar date, the customer shall not be charged. In the event of cancellation up to 14 days before the seminar date, the customer shall be charged 50 percent of the seminar price. In the event of a later cancellation, the customer shall be charged the full seminar price. The customer is however given the option of appointing a participant to take his place.

9 Cancellation/Postponement by ATG/R

9.1 ATG/R reserves the right to change the date and venue or cancel the seminar, even if a registration confirmation has already been issued, in the event of insufficient demand, insufficient participants, speaker cancellations, force majeure or for other important reasons that are not the fault of ATG/R. The affected participants shall be informed without delay and, wherever possible, shall be offered alternatives. In the event of cancellation or postponement of the seminar for one of the aforementioned reasons, no claims for damages may be asserted against ATG/R.

10 Liability disclaimer and indemnity

10.1 The information communicated in the seminar and contained in the accompanying materials, including all handed over data carriers, are didactically and expertly prepared by ATG/R to the best of their knowledge and belief. ATG/R accepts no liability for any errors in the information as defined in clause 1, nor for any resulting damages, in particular consequential damages.

10.2 Irrespective of the above 8.1, customer claims for damages and reimbursement of expenses (hereinafter referred to as claims for damages), for whatever legal reason, in particular due to violation of duties from the obligatory relation and for impermissible actions, are excluded. This does not apply

for compulsory liability, e.g. in accordance with the Produkthaftungsgesetz (German Product Liability Act), in the case of intent, gross negligence, injury to life, limb or health or violation of cardinal contract duties. Claims for damages for violation of fundamental contractual obligations are however limited to foreseeable damages that are typical for the contract, insofar as there is no liability as a result of intent, gross negligence or injury to life, limb or health. A change to the onus of proof to the detriment of the customer is not associated with the aforementioned stipulations.

10.3 Note: In the service course on electrical appliances, work is performed on live parts with voltages exceeding 42 volts. ABB shall accept no responsibility for accidents resulting from failure of the participant to observe the occupational health and safety regulations.

10.4 Further, ATG/R shall accept no liability for improper dealing of the premises and training appliances at the seminar venue and/or on the customer's own systems. In this context, liability is excluded for consequential damages as a result of incorrect operation by ATG/R trainers or participants. The customer must indemnify ATG/R against all claims of third parties that are asserted against ATG/R in connection with the aforementioned damages, and must fully reimburse ATG/R for all incurred costs and and expenses.

11 Accompanying materials

11.1 The documents reflect the status at the time of the seminar. ATG/R accepts no liability nor guarantees that the information shall remain valid.

11.2 ATG/R reserves all rights, including those of translation, reprint and reproduction of the accompanying materials or parts thereof. These may not be reproduced, forwarded to or processed by third parties, distributed or redesigned in Germany or abroad without the written consent of ATG/R. The software in the seminar rooms is copyrighted and may neither be copied nor removed.

12 Certificate

12.1 At the end of the course, the participant's qualification will be confirmed with the issuance of a certificate. Participants who are unable to follow the course content due to insufficient prior knowledge or comprehension difficulties will receive a confirmation of participation.

13 Other remarks

13.1 If the customer is a businessman, the sole legal venue for all disputes arising directly or indirectly from the contractual relationship is Mannheim. ATG/R is however also entitled to file a lawsuit at the customer's location.

13.2 German substantive law, with the exclusion of the Convention of International Sale of Goods (CISG), applies for the legal relationships in connection with this contract.

13.3 Should any individual provision or any part of any provision be or become void, illegal or unenforceable, the validity of the remaining provisions hereof shall in no way be affected. This does not apply if maintaining the contract would constitute unreasonable hardship for one of the parties.

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Course conditions for courses
on customer's premises

The following prerequisites must be fulfilled by the customer:

Occupational health and safety at the training venue
For reasons of occupational health and safety, the following conditions must be fulfilled by the customer:
- Secure attachment of the robot to the ground
- Sectioning off the robot movement area
- External emergency stop devices
- Observation of all valid occupational health and safety regulations.

Training robot equipment
- For mechanical and electrical equipment courses, the customer must discuss the suitability of the training equipment with ABB
- One robot system is required for one to three course participants
- Two robot systems are required for four to six course participants
- Three robot systems are required for seven to nine course participants
- Corresponding control generation
- Corresponding handling parts
- Storage positions
- On / off unit for six signals

Training room
The training room:
- must be located in the proximity of the training robot
- should be available for the entire duration of the course
- should be lockable

Production equipment risks to be borne by the customer for the course
ABB expressly points out that training courses bear risks for customer material / equipment, such as but not limited to:
- Collision when moving by hand or using the program; the gripper or another tool may become damaged or destroyed.
- Defects to parts such as components on the safety circuit board; under circumstances a replacement circuit board might not be available.
- Loss of data: There is no up-to-date backup or it was not verified that data is available for the complete installation of a system (system key and installation files).

Continuation of the training in the event of damage / breakdown of equipment
In the case of damage occurring to customer material or equipment failure, the following applies:
- Only the theoretical sections of the training plan can be continued.
- In consultation with the training management, the trainer can interrupt the training course and use the training time to carry out repairs.
- There is no entitlement to a repetition of the missing sections of the training course or to additional training hours.

Responsibility of the customer for damages and breakdowns during training
The customer bears the risks and costs for all damage and failure of their own equipment during the training course, as well as the inability to achieve the training goal as a result. These risks include, but are not limited to, the following:
- Production downtime as a result of a plant error during the training course
- Necessity to repeat the course
- Defects and damage to customer material / equipment
- Cost of repairs, spare parts, use of maintenance personnel, etc.

ABB

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How to find us

Directions via the A45
Exit the A45 at "Florstadt" and drive in the direction of Friedberg. After the town entrance sign, turn left after the pedestrian traffic lights in the direction of "Industriegebiet Grüner Weg" (industrial area). Follow the main road through the "Industriegebiet Süd" (industrial area) up to the traffic lights crossing. Turn right in the direction of B3 Gießen. At the second lights, turn left into Grüner Weg. ABB is on the left-hand side.

Directions via the A5
Exit the A5 at "Friedberg" and drive in the direction of Friedberg, past Rosbach v.d.H. Shortly before the town entrance sign for Friedberg, turn right at the roundabout into Grüner Weg. ABB is on the right-hand side.

Directions via the B3
Drive on the bypass up to the "Friedberg West" exit/Industriegebiet Grüner Weg (industrial area). Shortly before the town entrance sign for Friedberg, turn right at the roundabout into Grüner Weg. ABB is on the right-hand side.

Getting there by public transport
Travel to Hauptbahnhof Friedberg (main station). There are taxis at the station.

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www.abb.de/robotics

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Note

We reserve the right to make technical changes or modify the contents of this document without prior notification. With regard to purchase orders, the agreed particulars shall prevail. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

Schulungsprogramm_EN_A Mai 2019