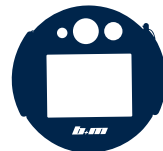


# b+m Training

## Programming



## Welcome to the training center of b+m...

Robots are our passion – yours as well?

Do you want to stay up-to-date with the latest technology and expand your present knowledge through further education and training? Do you want to be an important part of your company and be able to assist your colleagues and supervisors with help and advice?

Then you have come to the right place!

For over 20 years, we have successfully provided training on various topics in the field of painting technology, with the program always adapted to the latest technology. Our experienced instructors are real practitioners from the company, so that adequate expertise and enhanced product knowledge is actively passed on to the students.

On the following pages you will find our extensive training program for programming and maintenance of our robots.

Take a look and talk to us – we are happy to create an individual training package for you from our extensive range.

Your Benefits:

- Small learning groups
- Time for individual questions and solution strategies
- Extensive practical training directly on the robot

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<b>Contact:</b>	training@bm-systems.com
<b>Training types:</b>	Basic courses Advanced courses Intensive courses
<b>Number of participants:</b>	Maximal 4 persons
<b>Training site:</b>	b+m training center
<b>Costs:</b>	On demand

## Operating the Robot

### Training goal

With active participation, the trainees will learn to turn on and start the robot system, how the system works and to recognize and fix simple faults.

### Target group

This course is intended for system operators, system managers, maintenance personnel, project managers and plant managers.

<b>Course:</b>	T1-T2-BR
<b>Training type:</b>	Basic course
<b>Duration:</b>	2 days
<b>Number of participants:</b>	Maximal 4 persons
<b>Training site:</b>	b+m training center
<b>Prior knowledge:</b>	None

### Contents

- **Work Safety**  
Emergency stop and protection monitoring
- **Structure and Function**  
Summarized description of all components
- **Operation and Monitoring**  
Operation on control cabinet and teach pendant,  
Axis and space monitoring,  
Bearing and checking the “0”-position
- **User Interface**  
Menu structure, overview of the most important functions,  
Basics of robot movement,  
Program playback (manual and automatic mode),  
Manual control of external signals
- **Faults, Error Messages, Information**  
Reaction after a crash or emergency stop,  
Recognize/fix warning and error messages

## Programming for Beginners

### Training goal

With active participation, the trainees will learn purpose and function of the robot, the basics of robot program creation and the program structure of the robot.

### Target group

This course is intended for system operators, programmers and project managers.

<b>Course:</b>	T1-T2-PE
<b>Training type:</b>	Basic course
<b>Duration:</b>	4 days
<b>Number of participants:</b>	Maximal 4 persons
<b>Training site:</b>	b+m training center
<b>Prior knowledge:</b>	None

### Contents

- **Work Safety**  
General, Explosion protection,  
Emergency stop and protection monitoring
- **Structure and Function**  
Manipulator, Control cabinet, Teach pendant
- **Operation and Monitoring**  
Operating elements on the control cabinet, Function keys on the teach pendant, Operating modes
- **Basics of Robot Programming**  
Coordinate system, Types of movements, Main axes and wrist, Axis and space monitoring, Bearing and checking the “0”-position
- **User Interface**  
Menu structure, overview of the most important functions, Commissioning and service, Program management, Management and operation of painting parameters
- **Program Development and Structure**  
Program creation (insert, modify, delete), Function and purpose of the instruction list, Using the most important commands/inputs, Structure and operation of the header, Using comments for clear work, Program playback (automatic mode)
- **Faults, Error Messages, Information**  
Reaction after a crash or emergency stop triggering, Warning and error messages, Meaning and creation of singular points, Password protection

## Programming for advanced Users

### Training goal

With active participation, the trainees will learn to create and optimize programs.

### Target group

This course is intended for system operators, programmers and project managers.

<b>Course:</b>	T1-T2-PF
<b>Training type:</b>	Advanced course
<b>Duration:</b>	4 days
<b>Number of participants:</b>	Maximal 4 persons
<b>Training site:</b>	b+m training center
<b>Prior knowledge:</b>	Training: Programming for Beginners

### Contents

- **Work Safety**  
General summary
- **Operation and Monitoring**  
Overview of operation and function,  
Checking and adjusting the “0”-position,  
Adjust axis and space monitoring
- **User Interface**  
Explaining/working with all existing functions,  
Error analysis
- **Program Development and Structure**  
Overview of all possible commands/inputs,  
Conveyor synchronization,  
Block function (reflect, copy, move),  
Program optimization, practical exercises,  
Program playback (T2 and automatic mode)

## Offline Programming

### Training goal

With active participation, the trainees will learn offline programming for new parts, application and optimization of the created programs in the productive system.

### Target group

This course is intended for programmers.

<b>Course:</b>	T1-T2-OP
<b>Training type:</b>	Advanced course
<b>Duration:</b>	4 days
<b>Number of participants:</b>	Maximal 4 persons
<b>Training site:</b>	b+m training center
<b>Prior knowledge:</b>	Training: Programming for advanced Users or sufficient experience in robot programming

### Contents

- **Introduction**  
Program start and overview,  
Loading and moving an available robot,  
Storage location and path information
- **Cell control**  
CAD import of components,  
Create a cell and integrate robots,  
Measuring, positioning, saving
- **Programming**  
Import and edit existing programs,  
Create new programs and paint parameters offline,  
Export simulation and data,  
Test offline programs in the training center
- **Introduction to Multi-Sim**  
Simulate multiple robots at the same time,  
Checking for potential collisions

## Programming Intensive Course

### Training goal

With active participation, the trainees will learn purpose and function of the robot, the basics for robot program creation, the program structure of the robot and program optimization.

### Target group

This course is intended for programmers.

<b>Course:</b>	T1-T2-PE+PF
<b>Training type:</b>	Intensive course
<b>Duration:</b>	5 days
<b>Number of participants:</b>	Maximal 4 persons
<b>Training site:</b>	b+m training center
<b>Prior knowledge:</b>	Training: Operating the Robot or sufficient experience in robot programming

### Contents

- **Work Safety**  
General, Explosion protection,  
Emergency stop and protection monitoring
- **Structure and Function**  
Manipulator, Control cabinet, Teach pendant
- **Operation and Monitoring**  
Operation on control cabinet, Function keys on the teach pendant,  
Operating and movement modes of the robot, Check and set the  
“0”-position, Adjust axis and space monitoring,  
Data backup internal/external
- **User Interface**  
Menu structure, overview of all functions, Manual control of inputs/  
outputs, Edit tool coordinates (TCP), Program management,  
Manage and edit painting parameters, Adjustment of synchronization  
with external conveyor
- **Program Development and Structure**  
Program creation (insert, modify, delete), Function and purpose of the  
instruction list, Overview of all possible commands/inputs, Structure  
and operation of the heading, Using comments for clear work, Conveyor  
synchronization, Block function (reflect, copy, move), Program  
optimization, Program playback (T2 and automatic mode)
- **Faults, Error Messages, Information**  
Reaction after a crash or emergency stop triggering, Warning and error  
messages, Error analysis, Meaning and creation of singular points,  
Password protection

## Notes

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