



Robotics Training Guide

**Level 4 Certified Servicing
FANUC Integrator**

We provide innovative robotic solutions from concept to installation and 24/7 service and support for complete customer confidence.



MCRI Trainings Offered

FANUC Robots

Preventative Maintenance
Electrical and Mechanical Troubleshooting
Programming and Operations
Custom Curriculum (per customer needs)

Robot Preventative Maintenance (PM) Training

Class Size & Fees

Students - up to 5
Weekdays - \$1400/day
Weekends - \$1600/day

Class Includes

Morning refreshments and lunch will be provided for each student. Travel expenses will be the responsibility of each student



Training Description

Preventative maintenance performed on an available R-J3iB, R-30iA, or R-30iB robot in our shop.

Training Outline

Day 1 (8 hours)

1. Introduction
2. Backup robot
3. Jogging robot
4. Changing batteries
 - a. Robot batteries
 - b. Controller batteries
5. Greasing robot
 - a. Gear box
 - b. Cross roller bearings
 - c. Joints
6. Identifying worn electrical and mechanical components
7. Writing and running programs to allow excess grease to exit gear box
8. Review

MOTION CONTROLS ROBOTICS

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Electrical and Mechanical Troubleshooting

Class Size & Fees

Students - up to 5
Weekdays - \$1400/day
Weekends - \$1600/day

Class Includes

Morning refreshments and lunch will be provided for each student. Travel expenses will be the responsibility of each student

Training Description

Electrical Maintenance and Mechanical Troubleshooting performed on an available R-J3iB, R-30iA, or R-30iB robot in our shop.

Training Outline

Day 1 (8 hours)

1. Introduction
2. Major equipment/component overview
 - a. Backplane
 - b. Main CPU
 - c. Power supply unit
 - d. Emergency stop control
 - e. Servo amplifier
 - f. Operator box
 - g. Teach Pendant
 - h. Heat exchanger and fans
3. Basic robot operation
4. Jogging the robot
5. Symptom overview
6. Version identification
7. Safety signal status
8. Position status

Day 2 (8 hours)

1. Alarm log
2. Status lights and LEDs
 - a. I/O status
 - b. Teach Pendant status lights
 - c. Operator panel buttons and lights
 - d. Circuit board and servo amplifier lights
3. File manipulation
 - a. Backup robot programs
 - b. Image backup
 - c. Restore files and image
4. Control power circuitry
5. Main Board Replacement
6. Removing and reinstalling the PSU
7. Mechanical Troubleshooting
 - a. Discuss RV Reducers, Gears, Wave Generators, and Belt Drives
8. Robot mastering discussion
 - a. Preparing for mastering
 - b. Zero position master
 - c. Single axis master
 - d. Verify mastering



Day 3 (8 hours)

1. Servo amplifier replacement
2. E-stop circuitry
3. Clearing single chain faults
4. Troubleshooting when power cannot be turned on
5. Troubleshooting when teach pendant displays alarm messages
6. Troubleshooting the E-stop/fence string
7. Robot PM discussion
8. FANUC I/O discussion
 - a. Types of I/O and networks
9. Review

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Programming and Operations Training

Class Size & Fees

Students - up to 5
Weekdays - \$1400/day
Weekends - \$1600/day

Class Includes

Morning refreshments and lunch will be provided for each student. Travel expenses will be the responsibility of each student

Training Description

Programming and operations using R-J3iB, R-30iA, or R-30iB controller with FANUC Robotics Handling Tool Software.

Training Outline

Day 1 (8 hours)

1. Introduction
2. Major equipment/ component overview
3. Basic robot operation
4. Clearing faults and single chain faults
5. Coordinate systems and jogging the robot

6. Discuss the different frames
 - a. Tool frame
 - b. User frame
 - c. Jog frame
7. Create User and Tool frames

Day 2 (8 hours)

1. Robot mastering discussion
 - a. Preparing for mastering
 - b. Zero position master
 - c. Single axis master
 - d. Verify mastering
2. FANUC I/O discussion
 - a. Monitor, force and simulate I/O signals
 - b. UOP discussion
3. Position registers
4. Data registers
5. Reference Positions
6. User alarms

Day 3 (8 hours)

1. Create, modify, and execute T.P. programs
2. Create and execute Macros
3. Program structure discussion
4. Program timers and cycle timers
5. Messages and comments in a program
6. File manipulation
 - a. Backup robot programs
 - b. Image backup
 - c. Restore files and image
7. Review

Custom Curriculum (per customer needs)

A custom training curriculum can be designed around specific customer needs. Cost and length of class will depend on the requested needs. Contact us to setup training and define outline - (419) 334-5886, Press '4' or training@motioncontrolsrobotics.com