Course description

IN-RB03
Basic Robot Programming & Installed System
Overview

Course goal
The goal of the course is to improve the ability of run the Robot cell, Program Modification and responsible for engineering, commissioning, operation and Maintenance of Robotics for automation.

Learning objectives
Upon completion of this course, students will be able to:
- understand the use of Robot operational Safety and handling
- understand the critical elements of operation & maintenance of Robots
- Programming , modifications
- Calibration , System Installation
- Maintenance
- General troubleshooting

Participant profile
Personnel from production and operations engineering department, consultants responsible for engineering, commissioning, operation and maintenance of substations

Prerequisites
- Degree or diploma in engineering, basic knowledge of Automation Product

Topics
- Programme Theme, Overview
- Introduction of ABB Robot and their types , Robot Specification : Payload ,Reachability, Robot Controller and Operation panel Manipulator Overview ,Flex Pendant Overview , Safety overview and run chain
- Jogging , Axis Mode, Linear Mode, Reorientation
- Description of Robot Coordinate system, Base, World, Tool. Work Object
- Tool Center Point and Defining the TCP
- Motion Instruction MoveJ, MoveL, Move C,
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- Calibration and revolution counter update
- Maintenance & troubleshooting, SMB Battery replacement
- Question & answer, summarizing
- FOR, WHILE, GOTO and LABEL, TEST Assign =; Mathematical Instruction
- Operator Communication Instructions TPErase, TPWrite TPReadNum TPReadFK
- Clock Instructions and cycle time calculation
- Offset Function, Benefit of Offset programming
- Interrupt & TRAP routines
- Event Logs
- Programming example
- Software system architecture
- Robot Ware and System builder
- Explanation of installed Robot Program, Simulation and testing in Robot Studio, modifications
- Step by Step explanation of RAPID modules
- Function routines
- Restart procedures
- UAS: User authorization system
- System diagnostics data
- hand-on exercise

Course type and methods

This is an instructor led seminar with practical exercises. The language of the course is English

Course Duration

- The duration of the course is four days.
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**Overview**

### Course Outline

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<td>1. RAPID Program structure, Routines, Modules, Program Data</td>
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<td>2. Introduction of ABB Robot and their types, Robot Specification:</td>
<td>2. Input and Output Signals</td>
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<td>Payload, Reachability, Robot Controller</td>
<td>3. Logical Instruction/Program Flow Instructions COPACT IF, IF AND</td>
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<td>and Operation panel Manipulator Overview, Flex Pendant Overview</td>
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<td>3. Safety Overview and Run Chain</td>
<td>4. ModPos or Teaching of Program</td>
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<td>4. Jogging, Axis Mode, Linear Mode, Reorientation</td>
<td>5. Program EDIT by Copy/Paste</td>
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<td>5. Description of Robot Coordinate system, Base, World, Tool,</td>
<td>6. Saving and loading of user programs, and Parameters</td>
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<td>Tool, WorkObject</td>
<td>7. Taking Backup of the Robot system and restore the system,</td>
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<td>6. Tool Center Point and Defining the TCP</td>
<td>Installation</td>
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<td>7. Motion Instruction MoveJ, MoveL, MoveC</td>
<td>8. Calibration and Revolution Counter Update</td>
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### Day 3

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<td>1. FOR, WHILE, GOTO and LABEL, TEST</td>
<td>1. Software System Architecture</td>
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<td>2. Assign, =; Mathematical Instruction</td>
<td>2. Robot Ware and System Builder</td>
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<td>TPERase, TPWrite TPReadNum TPReadFK</td>
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<td>4. Clock Instructions and Cycle Time calculation</td>
<td>4. Step by Step explanation of RAPID modules</td>
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<td>5. Offset Function, Benefit of Offset Programming</td>
<td>5. Function Routines</td>
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<td>6. Interrupt &amp; TRAP routines</td>
<td>6. Restart Procedures</td>
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<td>8. Programming Example</td>
<td>8. SysDiagnosticsData</td>
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<td>9. hand-on exercise</td>
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