

ROBOTIC TRAINING LABORATORY

MODEL: RP-01



*Basic System:-
Robot + PLC Trainer
Model: RP-01*

*Advanced System:-
Robotic Assembly Station
Model: RAS-01*



This Robotic Training Laboratory uses a Mitsubishi RV-2AJ Robot and has been designed for those involved with courses in Industrial Automation, Mechatronics and Advanced Manufacturing Technology. The courses or investigative work that this unit can provide includes robot dynamics and kinematics study, peripheral unit integration using PLC, programming languages, types of grippers and work handling apparatus. Furthermore it can also be custom made to suit a wide range of applications.

FEATURES

- ◆ Teaches automation principles.
- ◆ Compact and modular
- ◆ Expandable table top system:-
- additional modules can be added to the base system
- ◆ Can be mounted on tabletop or linear slidebase.
- ◆ Realistic application for teaching Robotics and PLC using industrial standard components.
- ◆ Easily linked to any PC or PLC
- ◆ Work piece jig and fixtures for palletizing
- ◆ Pneumatic or Electric grippers
- ◆ Up to 16 I/O lines for external applications.
- ◆ Window Based Robot Simulation Software for offline programming
- ◆ Transparent enclosure with safety interlock
- ◆ Includes student courseware and manuals
- ◆ Mitsubishi MELSEC - Q series PLC, program up 8k step making it possible to perform multitasking task.
- ◆ Robot speed and repeatability makes it highly suited for both stand alone operations and integrated use in automated workcell applications such as CNC machine tending, FMS and CIM operations.

DESCRIPTION

The RP-01 uses a Mitsubishi RV-2AJ a 5 axis industrial robot for education and training purposes. The RP-01 is equipped with the robot controller and is externally controlled by a PLC. It has been designed to give the student experience in the control of a industrial robot with a supplementary open/close gripper function and can be integrated with a various optional peripheral component. This gives the student an immediate appreciation of how an industrial robot moves and how it can be programme to perform a specific task.

It is a modular concept and is expandable to station the following:-

- | | |
|------------------------------------|----------|
| 1. Articulated Robot Trainer | (RT-01) |
| 2. Robot and PLC Trainer | (RP-01) |
| 3. Robot and Conveyor Trainer | (RC-01) |
| 4. Robot and Vision System Trainer | (RV-01) |
| 5. Robotic storage station | (RS-01) |
| 6. Robotic Assembly Station | (RAS-01) |

Optional Peripheral Components

1. Single Conveyor Unit

This unit features a DC motor, linear acting solenoid plus opto-thru beam and optical sensors. Students be write programes to detect, indentify and accept or reject components. Operated by a $\pm 24V$ DC Power Supply

2. Vision System

This Vision System enables students to integrate the vision system and robot to perform quality check on products.

3. Rotary Indexer Table

The rotary indexer table is used to move parts in and out of robot working envelope. Controlled directly by robot controller as a servo axis or operated in an open - loop by $\pm 24V$ DC motor.

4. I/O Simulation Box

In - place of the PLC or in addition, this I/O Simulation Box allows the demonstration of the uses of input and output.

5. Linear Slide Base

This slide base serves to mobilize the robot and increase its work envelope. Controlled by pneumatic cylinder or servo motor with belt drive controlled by robot controller as a axis drive.

6. Part Feeder and Storage Devices.

Gravity / Pneumatic Parts Feeder is used to deliver or receive parts for use in a robotic materials handling or assembly station.

Automatic storage and Retrieval system (ASRS) standard configuration of 12 storage of alluminium profile bays. This ASRS is tended by the robot mounted on slide base for use as a stand alone unit or FMS/CIM operation.

7. Assembly Station

The robotic and PLC trainer can be upgrade to a fully automated assembly station using the single conveyor unit, vision system together with the rotary indexes table, I/O simulation box and part feeder options.

SPECIFICATIONS :**RV - 2AJ MECHANICAL ARM**

| | |
|--------------------------------|--|
| <i>Mechanical Structures</i> | : Vertical Articulated |
| <i>Degrees of Freedom</i> | : 5 axis + gripper. |
| <i>Payload capacity</i> | : 2 kg |
| <i>Axis Range</i> | J1 : Base rotation : 300°(± 150°) J2 : Shoulder rotation : 180° (– 60° + 120°) J3 : Elbow rotation :230° (-110° to + 120°) J4 : Wist pitch : - 90° to + 90° J5 : Wist roll - 200° to + 200° |
| <i>Arm Length</i> | : 250 + 160 mm |
| <i>Maximum Result Velocity</i> | : Approx 2,100mm/s |
| <i>Position Repetability</i> | :± 0.02 mm |
| <i>Standard Gripper</i> | : Motorised hand or Pneumatic hand |
| <i>Weight</i> | : Approx 17kg |

CONTROLLER - CR2 - 571

| | |
|-----------------------------|--|
| <i>Type of Control</i> | : PTP, CP Control, CPU 64 bit RISC, DSP |
| <i>No of Controlled</i> | Simultaneously 6 (max) axis |
| <i>Programming Language</i> | : Movemaster, Command II, MELFA - Basic IV. |
| <i>Teaching Position</i> | : 2, 500 points |
| <i>No of steps</i> | 5, 000 steps |
| <i>No of Programs</i> | : 88 |
| <i>General I/O</i> | : 16/16 points |
| <i>Major functions</i> | : Joint/ Linear/3D Circular Interpolation Palletizing, subroutines, multitask etc. |
| <i>Power Requirements</i> | : 207 - 253 VAC Single Phase |
| <i>Additional software</i> | : Mitsubishi offline programming software |
| <i>Weight</i> | : 8 kg |

Programming Method : Teach pendant

Accessories (Optional)

1. Window Based HMI Software for control monitoring of robot and peripheral equipments.
2. PLC Unit Option
 1. Analog input/output unit
 2. Positioning unit for servo motor
 3. Highspeed unit
 4. Remote I/O unit
 5. PID Control Software
 6. Serial data unit
3. Mitsubishi RV 2A
A 6 axis robot can be used for more robust movement.

Safety

The trainer is provided with an enclosed transparent plastic / perspex sheet with aluminium profile and door with safety switches

Overall Dimension (Basic System)

| | |
|--------|-------------------|
| Approx | Length - 1,200 mm |
| | Width - 900 mm |
| | Height - 1,000 mm |

TRAINING TOPICS

1. Robot programming & interfacing
2. Handling processes
3. PLC programming and interfacing
4. Robotic Cell Design and configuration
5. Networking & communication

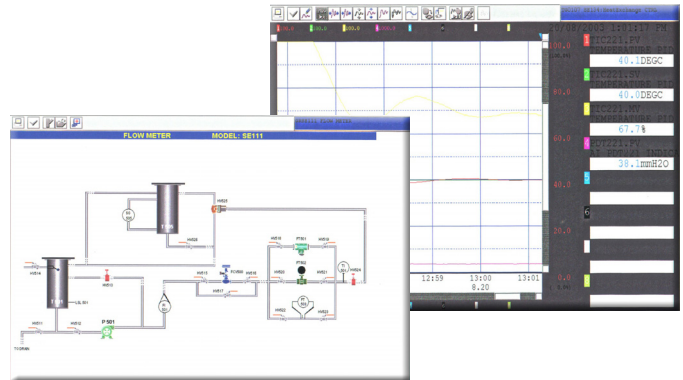
Note : Topics with the required optional equipment can be customized.

SOFTWARE & E - LEARNING

Our range of teaching equipment can be complemented with our SOLDAS and SOLCAL software.

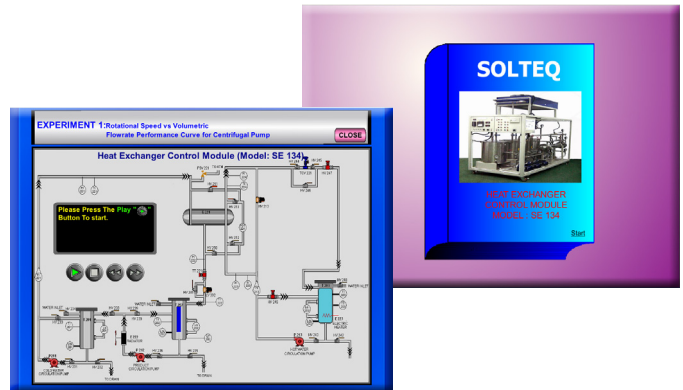
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