TP-3713
Cartesian Robot and Computerized Storage Training System

Objectives

The objective of this course is to teach the students the application of the manipulator arm principles, the technologies that are employed by this type of arm, its applications in industry and a basic insight into the theory required to control the manipulator arm. The application of the manipulator arm is demonstrated by means of a storage system and a pen plotter. The student can study Cartesian coordinate systems, logic, sequencing of events, storage methods and basic robotic control. He can apply logical reasoning to processes and employ them in formulating basic algorithms for problem solving. The students also apply and learn about the advantages of simulation in industry.

Description

The desktop unit contains a storage rack with 16 cells and storage pallets. A robotic manipulator arm is used to move the pallets from one cell to another. A simple change of the system configuration transforms the training system into a plotter. The system includes a dedicated, user friendly, control software package. This package enables the student to program the storage procedure flow diagram, simulate the sequence and, finally, execute the procedure on the actual system. Control is performed with the computer. The student will be able to write, test and run his/her own programs by applying the enclosed set of control commands.

Specifications

LEARNING PROGRAM

- History and uses of storage
- Storage principles
- Storage methods: FIFO, LIFO, free space
- Robotics basics
- Cartesian axis system
- Absolute and relative (local) coordinates
- Introduction to the computerized storage control software
- Writing, simulating and executing storage programs to solve storage problems
- The plotter
- Introduction to the plotter control software
- Writing plotter programs and executing them to produce drawings

The courseware or e-book contains the essential theory and detailed procedures for each hands-on activity.

TECHNICAL CHARACTERISTICS

- Movement range on the X-axis (400 mm)
- Movement range on the Y-axis (250 mm)
- Movement range on the Z-axis (100 mm with pneumatic piston)
- Grippe
- Nominal spacing between compartments on X-axis (116 mm)
- Nominal spacing between compartments on Y-axis (60 mm)
- Resolution (0.5 mm)
- Number of cells in warehouse (16, including input and output)
- Manipulator motor
- Movement speed along all manipulator axes (900 mm/min.)
- Plotter writing medium (whiteboard)
- Compressed air application (minimum pressure: 4 bar ; maximum pressure: 6 bar)
- Operating voltage (100 - 240 VAC, 50 / 60 Hz)
- General dimensions (650(w) x 415(l) x 610(h) mm)
- Emergency stop button
- Main power switch
- Computer – machine connection (USB)

SUPPLIED ACCESSORIES

The learning unit is supplied with the following accessories:
- 16 pallets (blue, red, green, yellow)
- Plotter pen and pen holder
- Software application and electronic book (soft copy) for MS Windows PC

REQUIRED ACCESSORIES

- Personal computer with MS Windows (not included)
- Air compressor (one per lab, 2.5 HP, 24 L, 10 bars; not included)

SAFETY FEATURE

The following safety feature is provided by the learning unit:
- 'Emergency Stop' pushbutton that cuts off all electricity to the unit when pressed.