

Abstract

In the last decade, technological advancement in the field of automation has brought a revolution in manufacturing and assembly engineering. The implementation of automation to the machines has reduced cycle time, increased production rate, reduced or even eliminated manpower required which has ultimately led to a reduction in production cost and improved productivity. Implementation of automation is nothing but converting machines into self-governing systems. The thesis refers to one such design and implementation of the low-cost automation system for the assembly operations that are being performed manually in the industry. Low-Cost Automation is a technology very important for the countries where the loss of a job is a very sensitive issue & productivity is essential for growth.

The company produces metal cop assembly manually which is further used in the textile industry with the yarn wound over it. As a part of the project, an assembly unit has been designed which is capable of performing assembly operation with a significant reduction in cycle time and human intervention compared to the present manual assembly operation. The designed assembly unit makes use of pneumatic components (i.e., Pneumatic cylinders, rotary actuators, etc.), vibratory bowl feeders and PLC. A concept proving prototype has been developed with certain modifications in the design. In the end, both the systems, the manual and the designed automated system, have been compared in terms of various parameters such as cycle time, manpower, etc.

Keywords: Low-cost automation, PLC, Assembly automation