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Development and Analysis of Wirelessly Controlled Robotic Arm

Naseem Rao

Assistant Professor, CSE Department, Hamdard University, Delhi, India

Abstract: In this paper, pick and place robotic arm is designed and implemented. This robotic arm is based on android application controlled for remote operation. In this paper, commands are sent to the receiver to control the movement of the robot either to move forward, backward and left or right etc using android application device. Four motors are interfaced to the microcontroller where two motors are used for arm and gripper movement of the robot while the other two motors are used for the body movement. The android application device transmitter acts as a remote control that has the advantage of adequate range, while the receiver end Bluetooth device is fed to the microcontroller to drive DC motors via motor driver IC for necessary work. Remote operation is achieved by any smart-phone/Tablet etc., with Android OS; upon a GUI based touch screen operation. This system can be enhanced by interfacing it with a wireless camera so that the person controlling it can view operation of the arm and gripper remotely.

Keywords: Robotic Arm, DC Motor, Wirelessly Controlled Robotic Arm, Android Application Device

I. INTRODUCTION

Pick & Place robots are used in a wide variety of material transfer applications. Basically, the machine takes a product from one spot in the manufacturing process sand places it into another location. A good example is a robot picking items of a conveyor belt and placing them into packaging boxes [1-5.]

The typical pick and place application requires high amounts of repetitive motion. Robots can eliminate human operation of hazardous tasks such as chemical spraying or heavy lifting. Pick and place robots have high return on investment when consistent shaped parts or containers are handled. Unlike human operators, robots also have the ability to work for an extended time [6-7].

II. PROPOSED ARCHITECTURE

The hardware implementation of pick and place arm system consists of AVR microcontroller, DC motor, Bluetooth, Motor Driver, Android application device and power supply.

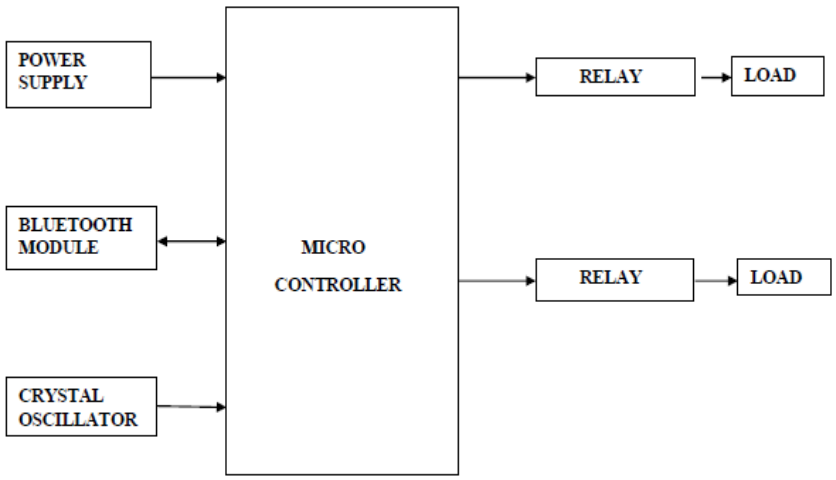

Fig 1: Block Diagram Wirelessly Controlled Robotic Arm

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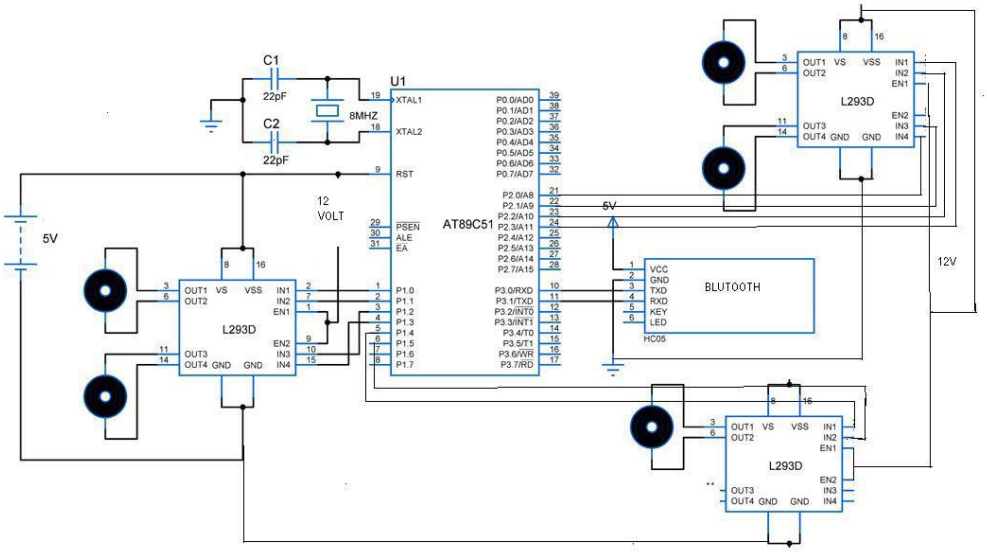

Fig 2: Circuit Diagram Of Robotic Arm

Block Diagram

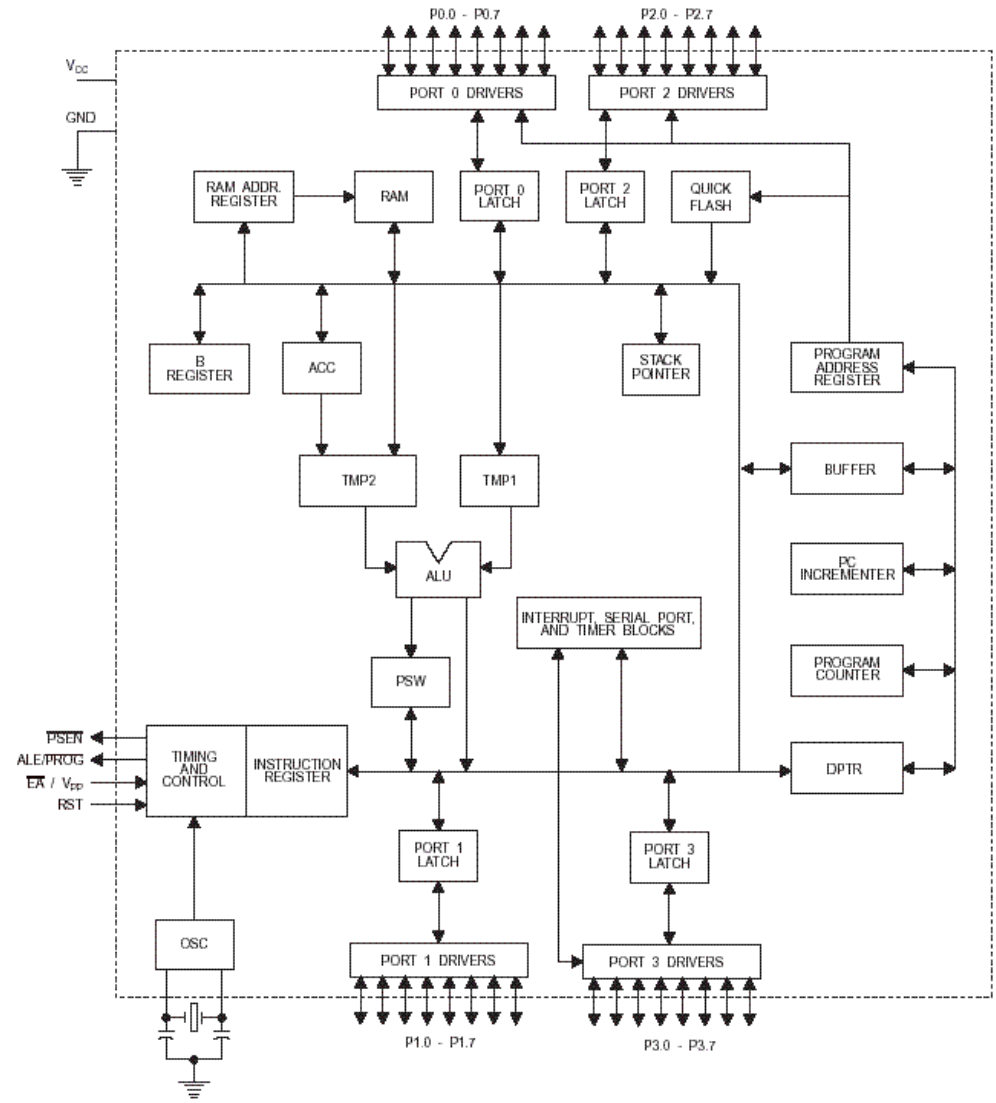

Fig 3: Low-power, high-performance CMOS 8-bit microcomputer used (AT89C52)

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III. CONCLUSION

In this work, a robotic arm controlled wirelessly by an android device is implemented. We have controlled the various movements of arm as well as vehicle by sending different commands from android device through Bluetooth, according to the size of the object. Due to this advantage, the robot can pick. This system can be used in various applications like in gripper, fabrication process, and inspection, processing, spraying, stamping and welding for work piece.

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