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IoT BASED SMART MULTIPURPOSE AGRICULTURAL ROBOT

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Abstract: ***This robotic system is named as agricultural robot, nothing but the machine which assembles with electronic equipment or components & performs specific operation as directed by instructor. This technology provides optimum and efficient solution for wide range of production in agriculture field. The robot is capable of performing operation like automatic ploughing, seed sowing and chemical spraying.***

Keywords: *AVR Controller unit, GSM module, DC motors.*

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I INTRODUCTION

Internet of Things (IoT) is used which is used to operate the functions through the mobile with the connections of GSM to the android based mobiles and it can handle the process by automatically and artificially. As name indicates robot is basically related with agriculture field. Agricultural robot performs seeding operation at specific interval of distance and time. For define distance range we can include keyboard i.e., as farmer decided at which particular distance seeding operation will perform. Robot must work in particular area of field. It will provide the technology which will give us a proper feedback from the seed hopper continuously, it will monitor seeds in the hopper when seeds going to end, it will send us a feedback message and will show current statues of the hopper. The need to optimize food production also introduces the challenge to reduce the cost for labour and mineral fuels and thus to minimize the operation hour of machinery in the field to the minimum required.

II BLOCK DIAGRAM OF AGRICULTURAL ROBOT

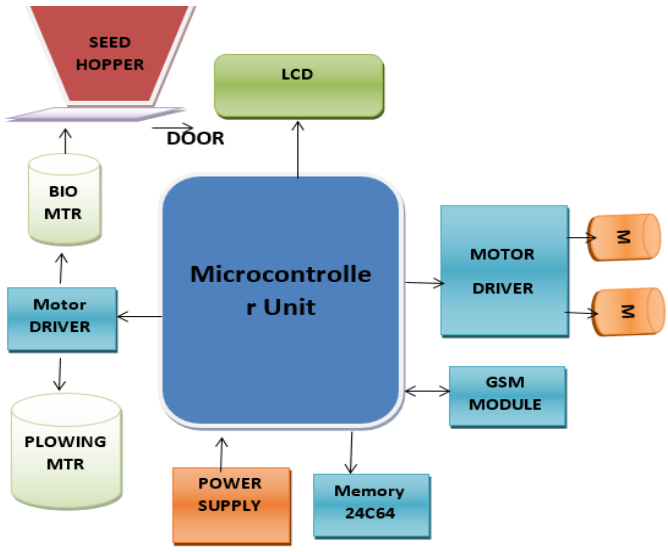


Figure 1: Block diagram

III BLOCK DIAGRAM DESCRIPTION:

AT89S52 MICROCONTROLLER

The AT89S52 is also a low-power, high-performance CMOS 8-bit microcontroller with 8K bytes of in system programmable non-volatile storing. The on-chip Flash allows the program memory to be reprogrammed in-system or a regular non-volatile memory programmer.

By joining a flexible 8-bit CPU with system programmable flash on a monolithic chip, the Atmel AT89S52 may be a robust microcontroller which provides a highly flexible and value effective result to several embedded control applications.

Memory

The 24C64 EEPROM memory is used to store the data about the last indication of the operation of the motor whether it absolutely was ON or OFF.

LCD Display

We are using LCD display to display ON or OFF operations.

DC Motor

This DC motor with metal gear head is typically utilized in various robotics applications has following electrical and mechanical provisions.

Motor driver

Motor driver are use to drive the motors.

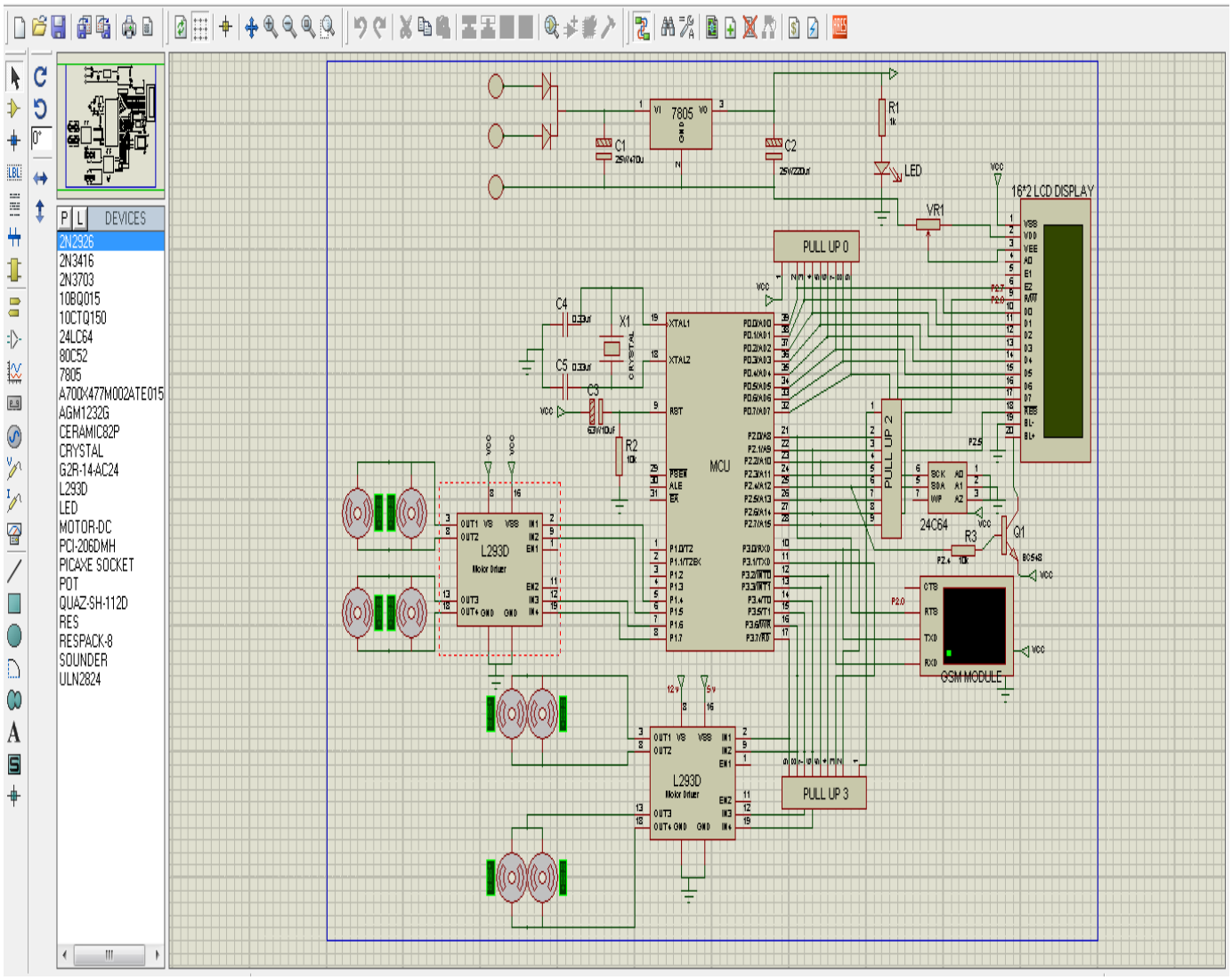
Power Supply

Initial stage of each electronic circuit is power supply system that gives required power to drive the whole system. The specification of power supply depends on the ability requirement and this requirement is decided by its score. For our project we require + 5 and +12 Volts supply. +5 Volts and. 5Volts given to Micro-controller, segment etc. +12 Volts are accustomed drive the motor.

IV SOFTWARE USED:

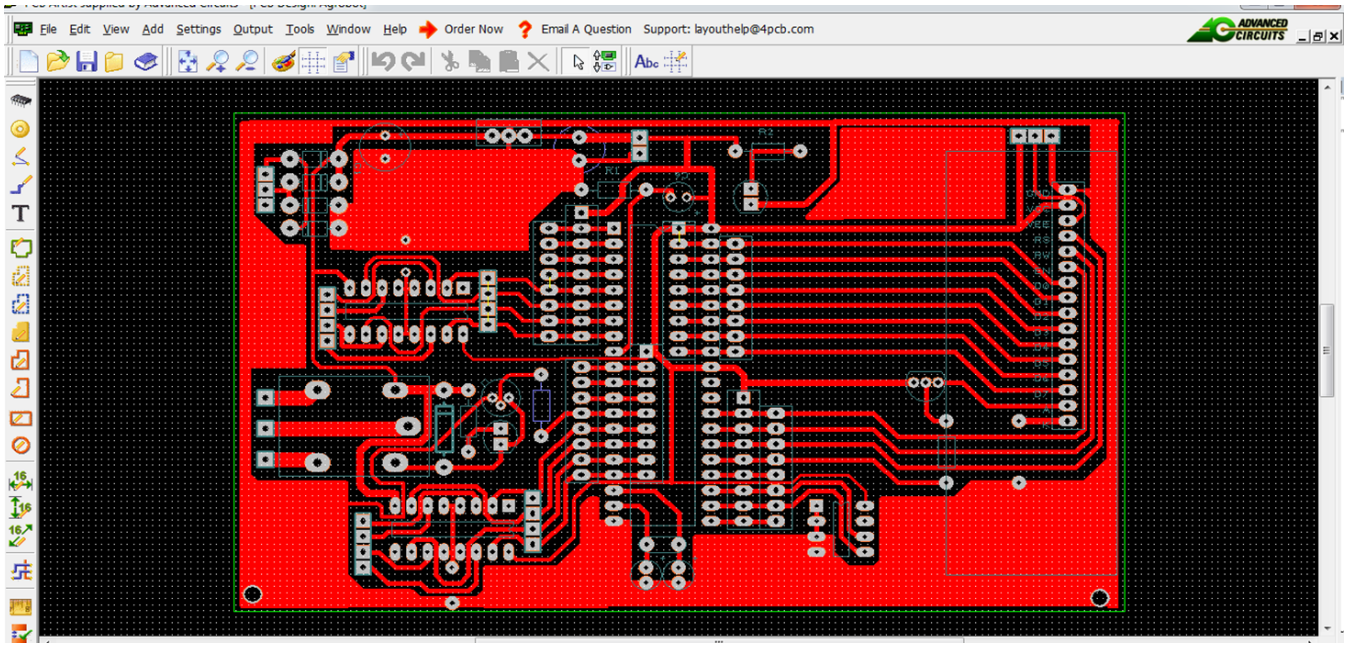
ISIS PROFESSIONAL

ISIS Professional software used for Circuit designing



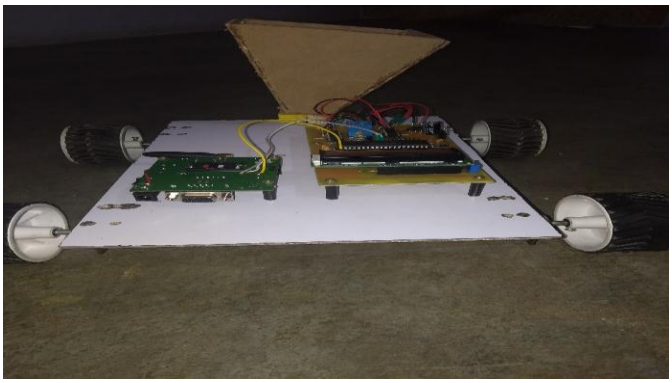
V PCB DESIGNING:

PCB's are the backbone of any electronic devices, and therefore knowledge of PCB layout tools can be a vital skill.



VI WORKING PRINCIPLE:

1) This IOT based agricultural robot performs ploughing and seeding.
2) As the power supply gets on, the agricultural robot starts moving forward and perform ploughing with the help of DC motor. L293D motor driver are used to control the wheels of robot and at the same time the seeds in hopper gets dropped into the soil at a specific distance.
3) The door of the seed hopper gets open and closed automatically when the seeds get dropped into the soil.
4) When the seed hopper gets empty then it can send a feedback message to the operator to fill the containers with the help of GSM and also displays on LCD.
5) While taking turn to the next row the ploughing arm moves upward and after moving the next row arm get moves downward automatically because it has a risk to get damage.
6) The robot automatically stops when the whole operation is performed.
7) The whole operation is handled through the mobile phone.



VII RESULT AND DISCUSSION:

In this IOT controlled agricultural robot, also called Agrobot has been designed and demonstrated to perform ploughing and seeding in agricultural field easily and efficiently. When the robot will get ON or OFF it will display on the LCD and when the seed hopper gets empty it sends message of "empty box" to the farmer's mobile phone.

VIII CONCLUSION:

In this IOT based project the agricultural robot has been designed, builted and demonstrated to carry out ploughing and seeding in an agriculture field. The agricultural robot will assist the farmers in increasing crop yielded and the implementation of agricultural robot has significant saving in terms of time, efficiency and saving the wastage of resources and reduced utilization of man power should pay cost once the system is activated.

IX FUTURE SCOPE:

Since the designed agricultural robot is used only for sowing of seeds and ploughing it can controlled through internet of thing, the following features can be added for enhancing the current project work: pH meter can be in order to determine the pH of the soil which helps to identify the suitable pesticide/fertilizer to be employed, moisture level sensor can be employed to know about the moisture control present in the soil of the farmland and also the robot can work on solar energy it will save electricity and can also be reduced environmental pollution. Also it can perform harvesting, picking fruits and monitoring of crops.

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