

WIRELESS AGRO ROBOT FOR PLANTING AND IRRIGATION CONTROL IN FARMS

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ABSTRACT

This project involves a solar powered AGROBOT (agricultural robot) for performing various agricultural activities like sowing seeds and measuring water content in the soil using soil moisture sensor and along with a precision agriculture model consisting of wireless sensors to assist irrigation control. This enables a single operator to cultivate more than one field from anywhere by connecting GSM and GPS modules to the AGROBOT.

This AGROBOT is mainly designed for the purpose of reducing manpower in the field and thereby reducing the investment in the cultivation process. In future if this AGROBOT model is developed into a product it will be a great boon to Indian agriculture.

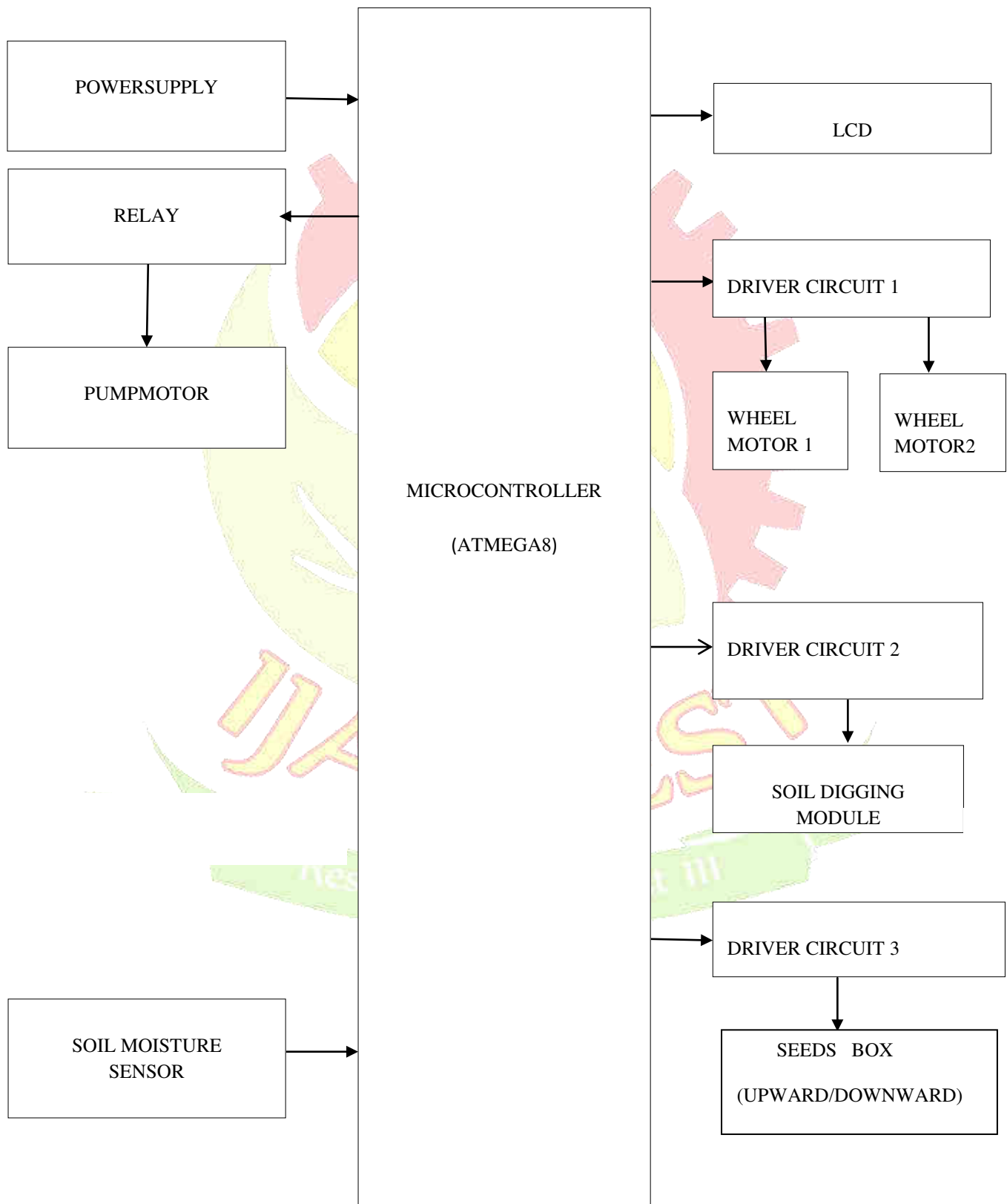
I.KEYWORDS

Power wastage, soil digging module, man power reduction, seed sowing mechanism.

II.INTRODUCTION

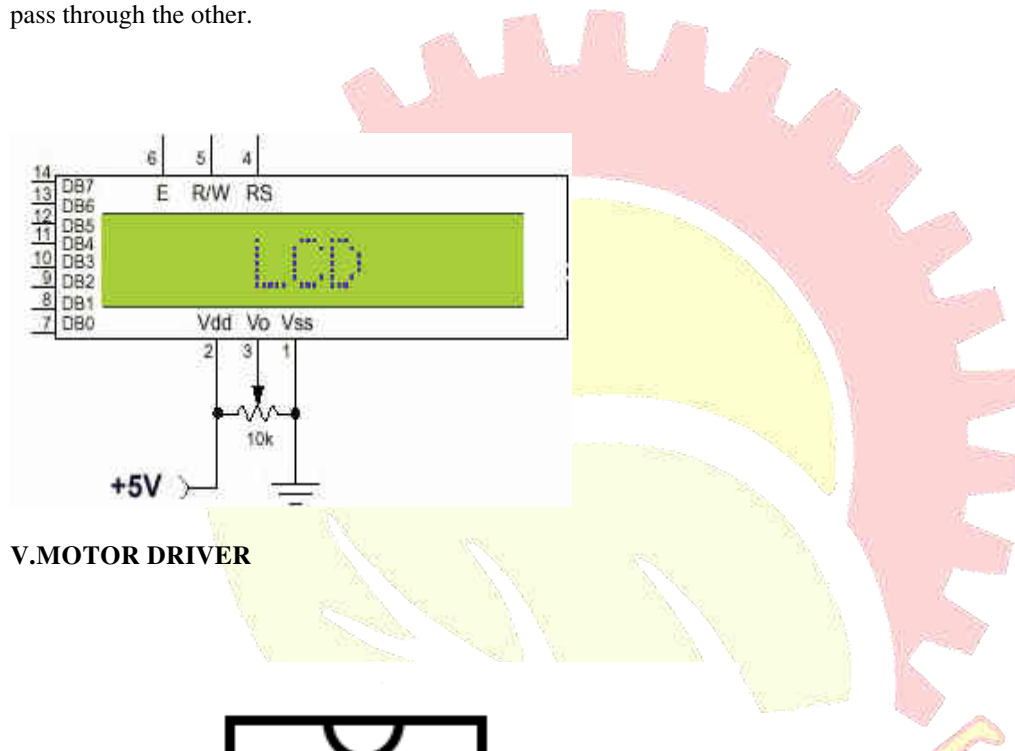
Now a day's agriculture is shrinking because of lack of workers and lack of investments. Except introduction of hybrid crops no other advancement has been made in agriculture. The instruments which is introduced to reduce the man power in field will be either costly or maintenance cost is high. Then it will take very long years for those instruments to reach the farmers also. But this AGROBOT is a very simple instrument where many instruments are coupled together and control of these instruments has been automated.

III.METHODOLOGY

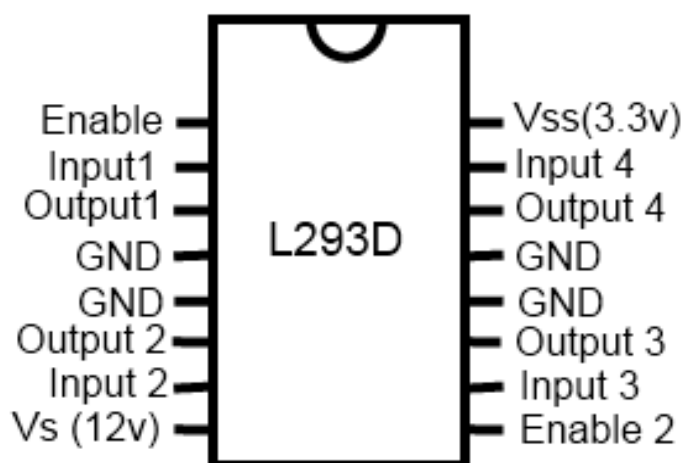


IV.LCD DISPLAY

A liquid crystal display (LCD) is a thin, flat display device made up of any number of colour or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.



V.MOTOR DRIVER



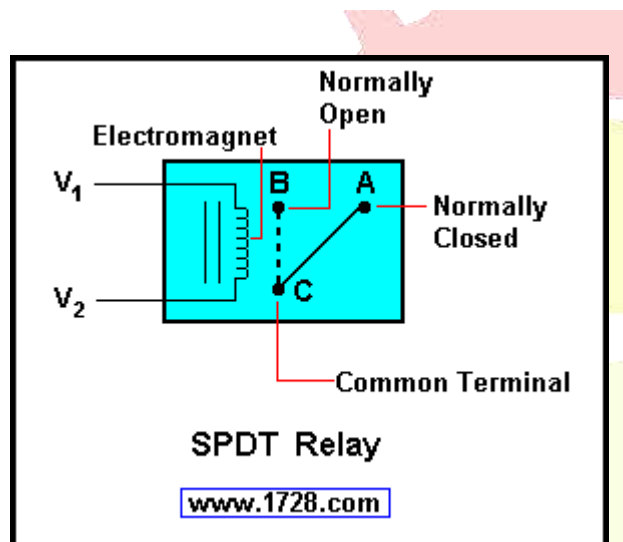
L293D is a dual [H-bridge](#) motor driver integrated circuit (IC). Motor drivers act as current amplifiers since they take a low-current control signal and provide a higher-current signal. This higher current signal is used to drive the motors.

L293D contains two inbuilt H-bridge driver circuits. In its common mode of operation, two DC motors can be driven simultaneously, both in forward and reverse direction. The motor operations of two motors can be

controlled by input logic at pins 2 & 7 and 10 & 15. Input logic 00 or 11 will stop the corresponding motor. Logic 01 and 10 will rotate it in clockwise and anticlockwise directions, respectively.

Enable pins 1 and 9 (corresponding to the two motors) must be high for motors to start operating. When an enable input is high, the associated driver gets enabled. As a result, the outputs become active and work in phase with their inputs. Similarly, when the enable input is low, that driver is disabled, and their outputs are off and in the high-impedance state.

VI.RELAY



A relay uses an electromagnet. This is a device consisting of a coil of wire wrapped around an iron core. When electricity is applied to the coil of wire it becomes magnetic, hence the term electromagnet. The A B and C terminals are an SPDT switch controlled by the electromagnet. When electricity is applied to V1 and V2, the electromagnet acts upon the SPDT switch so that the B and C terminals are connected. When the electricity is disconnected, then the A and C terminals are connected. It is important to note that the electromagnet is magnetically linked to the switch but the two are NOT linked electrically.

VII.SOIL MOISTURE SENSOR

It measures the quantity of water contained in the material such as soil and other basis. To obtain accurate measurement, a soil temperature sensor is required for calibration.

VIII.POWER SUPPLY

It is an electronic device and supplies electrical energy into electrical load. The function of power supply is to convert one form of electrical energy into another. Polycrystalline solar panel is used and lead acid battery is used to store power which was collected from solar panel.

IX.SEED BOX

Seeds are placed in a seeding tray. Timed output signals from microcontroller are provided to electromechanical switch, which in turn opens and closes the flap that covers the seeding hole in the seeding tray.

X.PUMP MOTOR

DC water pump uses low voltage power supply and it can be operated easily. It is used because it has some advantages such as no shock, safety purpose, cost effective, adjustable speed and corrosion resistance.

XI.MICROCONTROLLER:

- Operating Voltages

- 2.7 - 5.5V (ATmega8L)

- 4.5 - 5.5V (ATmega8)

- Speed Grades

- 0 - 8 MHz (ATmega8L)

- 0 - 16 MHz (ATmega8)

- Power Consumption at 4 Mhz, 3V, 25°C

- Active: 3.6 mA

- Idle Mode: 1.0 mA

- Power-down Mode: 0.5 μ A

XII.EXPECTED OUTCOME

Agricultural robots are capable of sowing seeds, spraying water in the field. This is also capable of measuring water content of soil in agricultural field. Agricultural robots come equipped with GPS and GSM that are used to control the agricultural robot in the field from anywhere. Sensor is used to measure the moisture level in the field.

XIII.CONCLUSION

This system is beneficial to farmers for seed sowing operation. Total yield percentage can be increased effectively. Labour problem can be reduced. Also seed wastage is less. So this will be a better option for farmers who wanted to perform the seed sowing operation in well-organised manner.

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