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Multifunction Agriculture Device using IOT

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ABSTRACT—Smart agriculture is an emerging concept as IOT sensors can provide information about agricultural sectors and then act on it based on user input. This paper proposes to develop a smart farming system that uses technologies such as IOT and Wireless Sensor Network. Paper aims to leverage emerging technology, or IOT, and smart agriculture through automation. Monitoring environmental conditions is the most important factor in improving the yield of an efficient crop. The feature of this article is to develop a system that can monitor temperature ,humidity and An announcement of an application developed for the farmer's Bluetooth connectedto the mobile phone. Due to its energy availability and low cost, the system has the potential to be
useful in geographically limited areas.

KEYWORDS*:* Seed Sowing, Bluetooth Module, DHT11 Sensor IOT, Node MCU and Relay.

I. INTRODUCTION

In India is usually a traditional seed seeding methods include the use of animal manure funnel pipe drill or tractor drilling. The focus on the development of the autonomous field Robots are /currently the speed, energy efficiency, sensors for control accuracy and enablement technologies. The previous method requires work and a lot of time and consuming energy. Where as in tractor based encountered by drilling operators of such energy sources to high levels of noise and vibration harmful to health and ability to work. in ancient technology was not developed for such a thing a lot So they sowed by hand. But technology is developed today.

With the help of a robot technology, can sit in a cool place and do seeding following the movement of the robot. So now no need to sow sunlight.Recently years, robotics in agriculture with it an application based on precision agriculture the concept is a new technology. The design of such robots is modeled specific approach and certain considerations the agricultural environment it enters to work The main reason for automation cultivation processes save time and energy necessary to perform repetitive fieldwork tasks and increase crop productivity through cultivation. Agribot is a created robot for agricultural use. It is designed to minimize farmers are working in addition to increasing speed and work accuracy. It fulfills basic operations related to cultivation i.esow seeds, cover watering the seeds with soil and water. In India agriculture is the backbone of the economy. 50% the population directly participates in agricultural activities appears in the leaves of the plant. In the current scenario, most are countries do not have enough skilled labor especially in the agricultural sector and it affects growth of developing countries. So it's time to automate the industry to solve this problem. An the innovative idea of our project is to automate the process of sowing plants such as sunflower, baby corn, peanuts, cotton and vegetables such as beans, lady's finger, pumpkin and pulses like black gram, green gram etc. to reduce human labor and more income. Seeds are happens automatically with a DC motor. Then the distance between two seeds is governed by and changed by a microcontroller. This is also possible grow different seeds for different distance.

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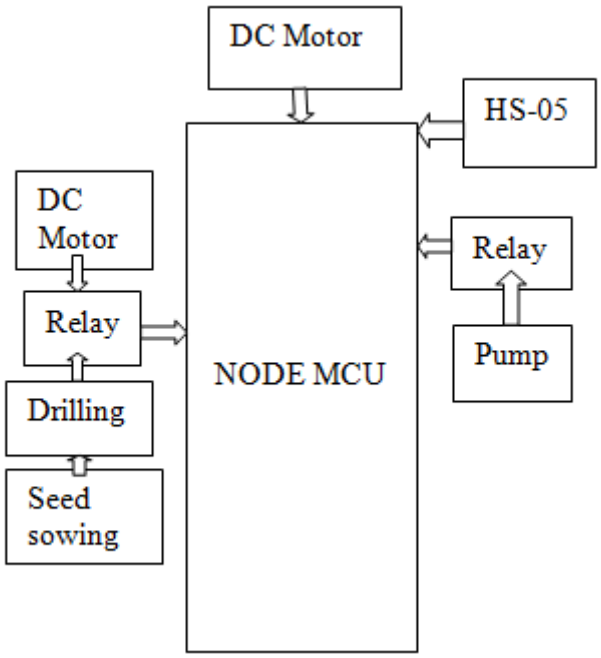
II. MULTIPURPOSE AGRICULTURE DEVICE

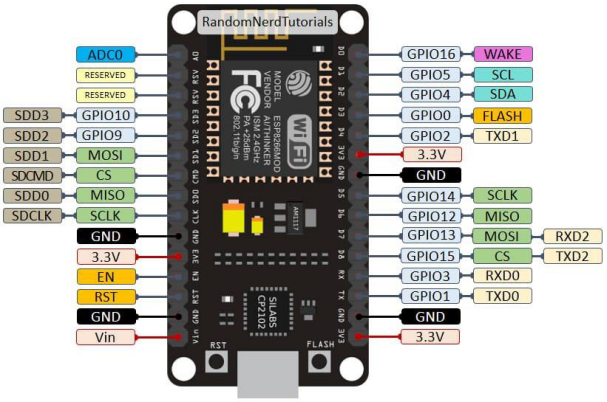
In this block diagram, there is a microcontroller without the main part of the whole project the microcontroller is not working. 5V power is supplied to the



BLOCK DIAGRAM

microcontroller and 12v to the DC motor. In addition here AGRIBOT uses three DC motors, two motors forward and backward are used, then the other engines are used for drilling and. It is managed by a Wi-Fi device, ie. ESP8266 module for wireless use communication RX-TX pin of Wi-Fi module is then connected to the Bluetooth module TX-RX connector power is distributed by the Wi-fi module to the Bluetooth module by connecting the Vcc ground pin. Then the movements of the robot are controlled by Bluetooth application giving instructions as forward ,back, left, right, drill and sow, Each power supply component is all these powers are given by design energy source The main reason automation of cultivation processes saves money time and energy required to complete the repetition agricultural tasks and increasing productivity yield by treating each crop separately the concept of precision agriculture. The agricultural robot is intended only for sowing seeds. This is a four-wheeled vehicle. Its operation is based on precision farming that allows efficient sowing seeds with optimal spacing of plants.

A. NODE MCU



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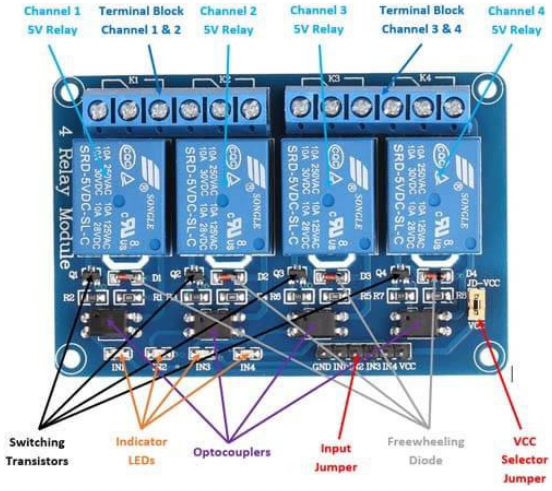
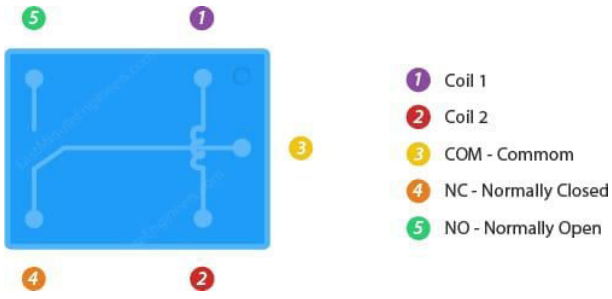
A low-cost System-on-a-Chip (SoC) called the ESP8266 serves as the foundation of the open-source NodeMCU (Node Microcontroller Unit). The Espressif Systems-designed and produced ESP8266 has all the essential components of a computer, including CPU, RAM, networking (Wi-Fi), and even a contemporary operating system and SDK. This makes it a fantastic option for all types of Internets of Things (IoT) projects The ESP8266 is difficult to access and use as a chip, though. For the simplest operations, like turning it on or sending a keystroke to the "computer" on the chip, you must solder wires with the necessary analogue voltage to its pins. Additionally, you must programme it using low-level machine instructions that the device can understand. Processor is L106 32 - bit RISC microprocessor core based on the Tensilica Diamond Standard, Memory is about 32 KiB instruction RAM, 32 KiB instruction cache RAM, 80 BiB user- data RAM, 16 KiB ETS system - data RAM, Integrated TR switch, 17 GPIO pins, Serial Peripheral Interface BUS (SPI).

B. 4-CHANNEL RELAY CONTROL BOARD MODULE



The Quad Channel Relay Module has four 5V relays and break switching and isolation allowing easy connection to microcontrollers or sensors with small components and connections. There are two junction boxes, each with six terminals, and each junction box is shared by two relays. The terminals are screw type which makes the power cable connection easy and flexible. The main components of the Four Channel Relay Module, 5V Relays, Terminal Blocks, Nipples, Transistors, Optical Couplers, Diodes and LEDs. Four-Channel Relay Module Specifications are supplying voltage is 3.75V - 6V, triggering Current is 5mA relay activation current is 70mA for single module and 300mA for all four-relay module, Relay Max 40VAC, 2 Current is 10A.

C. 2-CHANNEL RELAY CONTROL BOARD MODULE



The relay which works at the heart of the relay is an electromagnet which defines a coil that produces a temporary magnet when energized. A relay can be thought of as a power source; you turn it on with a small current and with more power it turns on another device. The device is connected between the COM (mode) terminal and the NC (normally closed) or NO (normally open) terminal, depending on whether the device is kept normally open or always closed. Between the two additional pins (coil 1 and coil 2) is a coil that acts as a magnet. The 2-channel relay module is a simple board that can be used to control high voltage, current devices such as motors. A relay module is an electronic switch that can be turned on or off to allow current to flow. It is designed to handle voltages as low as 3.3V for ESP266.

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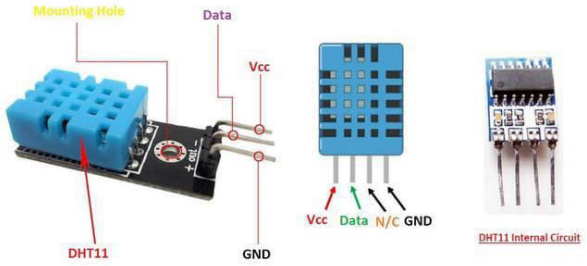
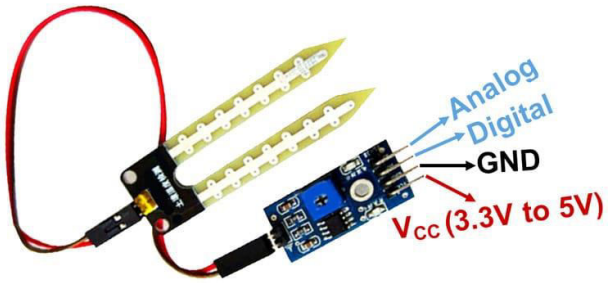
D. DHT11 SENSOR



DHT11 is a temperature and humidity device. The sensor comes with an NTC sensor to measure temperature and an 8-bit microcontroller to output temperature and humidity values as serial data. The sensor is also factory calibrated so it is easy to interact with other microcontrollers. The sensor can measure temperature from 0°C to 50°C and humidity from 20% to 90% with accuracy of ±1°C and ±1%. Therefore, if you want to measure within range, this sensor will be a good choice for you.

E. SOIL MOISTURE SENSOR



Soil moisture sensors measure the volumetric water content in soil. Since the direct gravimetric measurement of free soil moisture requires removing, drying, and weighting of a sample, soil moisture sensors measure the volumetric water content indirectly by using some other property of the soil, such as electrical resistance, dielectric constant, or interaction with neutrons, as a proxy for the moisture content. The relation between the measured property and soil moisture must be calibrated and may vary depending on environmental factors such as soil type, temperature, or electric conductivity.Reflected microwave radiation is affected by the soil moisture and is used for remote sensing in hydrology and agriculture. Portable probe instruments can be used by farmers or gardeners. Soil moisture sensors typically refer to sensors that estimate volumetric water content. Another class of sensors measure another property of moisture in soils called water potential; these sensors are usually referred to as soil water potential sensors and include tensiometers and gypsum blocks Measuring soil moisture is important for agricultural applications to help farmers manage their irrigation systems more efficiently.

III. WORKING

An intelligent agricultural robot can be directed in different directions, for example forward, backward, left and right. Several of these instructions for the user by clicking on the appropriate buttons . After receiving the order the Node MCU sends it to the Bluetooth module. Then the microcontroller then controls the motor control circuit move the robot. In addition to these, e.g. multiple operations such as sowing and drilling is fulfilled. According to the Bluetooth controller the microcontroller executes the command as (2) forward, (1) reverse, (3) left turn, (4) right turn, (5) stop , (6) drilling & sowing .Accordingly the seeds are kept in a small container and sealed with a little applause. This turn is governed by servo motor to open and close the container. Then the servo motor can rotate 180 degrees. Meanwhile, when the servo motor is 180 degrees, it automatically opens the container and so

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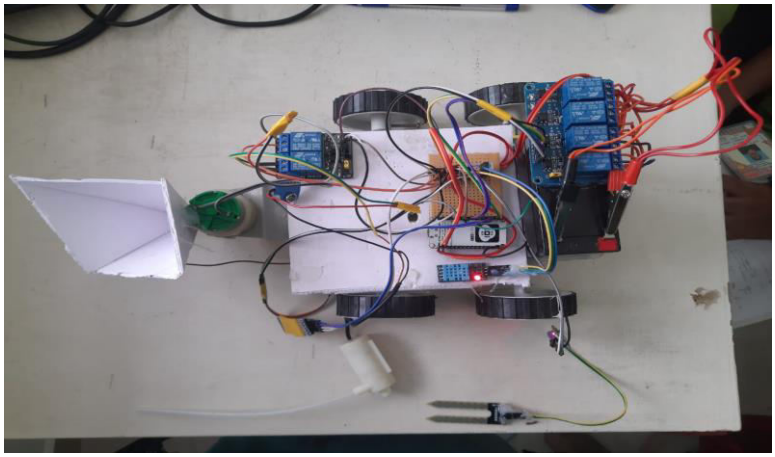
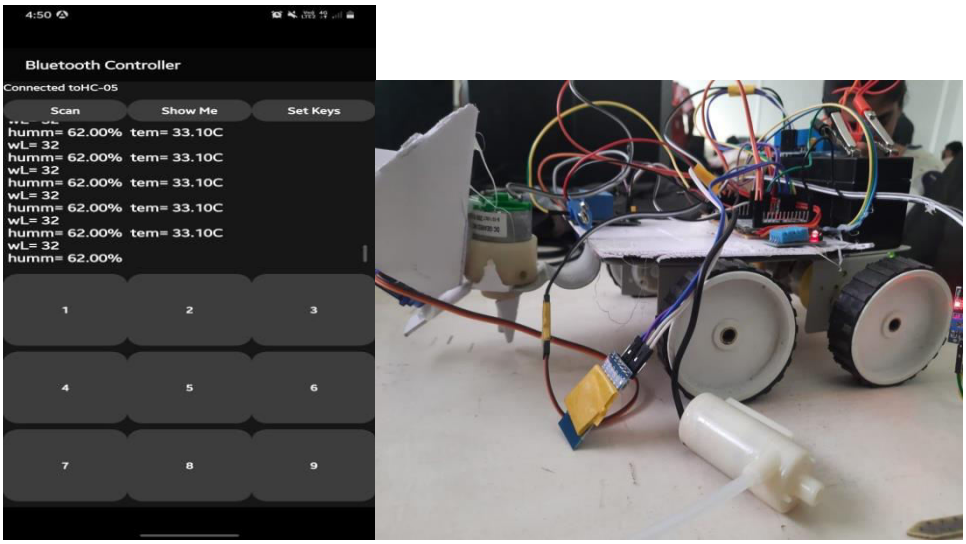


Seeds are sown in the field.Temperature sensor connected bluetooth module helps send information about the temperature to the user by HS-05 module. Knowing the temperature, water can be poured into the field. It can be done by relay. Relay causes the valve to allow and stop flow of water.

IV. RESULT AND CONCLUSION

The hardware components are successfully connected to microcontroller Test results are Showed in the above fig and the temperature and humidity is monitored by the Bluetooth controller application. The different field work such as drilling, seed sowing , irrigation, and levelling is



made and verified using a WiFi module. The results obtained advanced agricultural robots include: increased biodiversity, increased productivity and increased profits. Advanced agricultural robot target produce safe food for consumers healthy.

V. ADVANTAGES

a) Time and manual power are reduced.
b) The robot can reveal different ones weather conditions.
c) Used in various fields such as agriculture, medicine, mining and space exploration.
d) Machines could easily drive around trees, rocks, ponds and other obstacles

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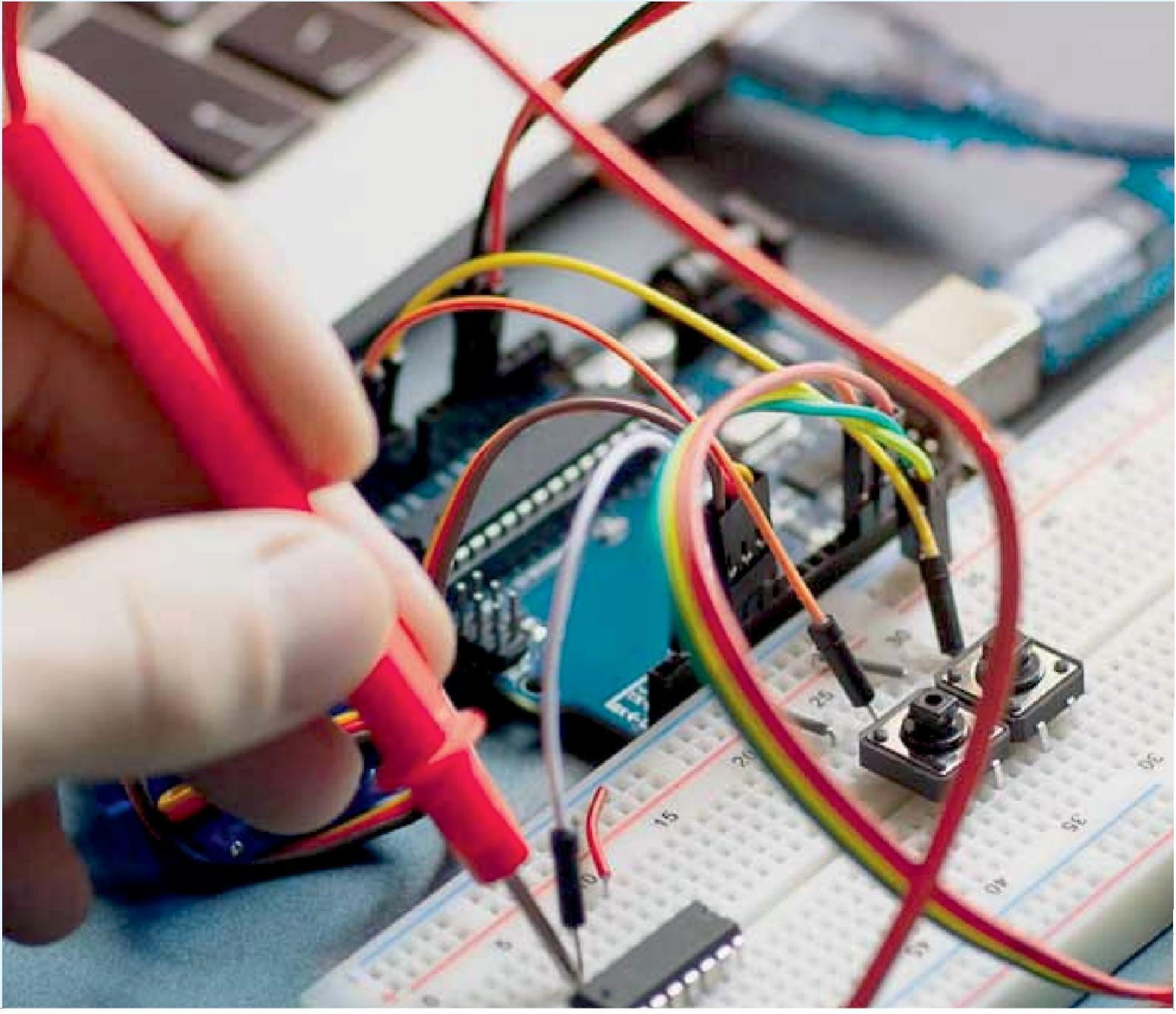

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