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Smart Soil Monitoring System For Agriculture Production

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Abstract

Agriculture plays a vital role in the development of agricultural countries. Issues concerning agriculture have been always hindering the development of the country. The only solution to this problem is smart agriculture by modernizing the current traditional methods of agriculture. Hence the method is making agriculture smart using automation and IoT technologies. Internet of Things (IoT) enables various applications of crop growth monitoring and selection, automatic irrigation decision support, etc. Using a Capacitive Soil Moisture Sensor to measure moisture content present in the soil. Also using the DHT11 Humidity Temperature Sensor to measure Air Temperature and Humidity

Keywords: Automation, Measure, Monitor

1. INTRODUCTION

In this paper is about there are many devices to monitor the quality of soil and calculate the amount of nutrition, But the problems is cost, accuracy and size of the equipment. The proposed project aims to supply water when farm is dry without human presence and avoiding water wastage in irrigation process. Also monitor the soil parameters like temperature, humidity and soil moisture level. It will also be possible to control various operations of the field remotely from anywhere, anytime by mobile as well as web application. This gives signals to the mobile phone whether to send water to the field or not.

The soil moisture detector detects the soil moisture content if the soil moisture content is very low then the motor is automatically on and water supplies to the soil. If the soil has a sufficient amount then the motor turn off automatically.

2. PROPOSED SYSTEM

Soil nutrient analysis using wireless sensor networks (WSN) enables various application like remote monitoring of soil fertility, analysis, provide a selection of crop and build irrigation decision support systems. In the proposed system, the wireless sensors measure the macro

nutrient of soil and transmit the data to the cloud. The user can view the soil fertility at the convenience on their mobile application. It is possible that the farmer may wish to grow a specific crop based on the economic interest. It gives the following benefits.

1. Updates On mobile phone directly
2. Accurate monitoring results
3. Remote location monitoring
4. Cloud Storage

3. MODULES

3.1. Node MCU

NodeMCU is an open-source Lua based firmware and development board specially targeted for IoT based Applications. It includes firmware that runs on the ESP8266 Wi-Fi SoC from Espressif Systems, and hardware which is based on the ESP-12 module.

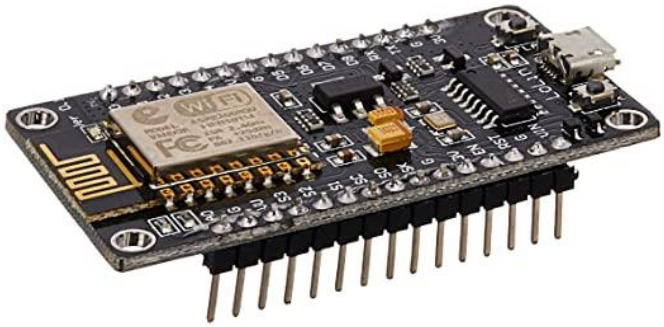

Figure No.1 currency

3.2. CSM Sensor

This is an analog capacitive soil moisture sensor which measures soil moisture levels by capacitive sensing, i.e capacitance is varied on the basis of water content present in the soil.

Figure No.2 Capacitance soil Moisture sensor

3.3. DHT11 Sensor

DHT11 is a basic, ultra low-cost digital temperature and humidity sensor. It uses a capacitive humidity sensor and a thermistor to measure the surrounding air, and spits out a digital signal on

the data pin. The only real downside of this sensor is you can only get new data from it once every 2 seconds, so when using the library, sensor readings can be up to 2 seconds old. In this project, we will use this sensor to measure the air temperature and humidity.

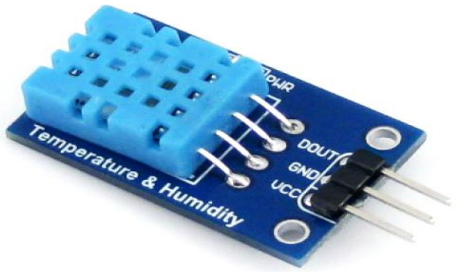

Figure No.3 DHT11 Sensor

3.4. Relay Module

Relays are used to provide time delay functions. They are used to time the delay open and delay close of contacts. Relays are used to control high voltage circuits with the help of low voltage signs. Similarly they are used to control low current circuits with the help of high current signals. They are also used as protective relays. By this function all the faults during transmission and reception can be detected and isolated. The relay is an automatic protective and switching device.

Figure No.4 Relay Module

4. CONCLUSION

The project of the citrus moisture, temperature and nutrient monitoring based on the Internet of Things platform was proposed. As a result of the hierarchical thinking of the Internet of Things, the decision support system is divided into the perception layer, network transport layer, information service layer, application layer. Practice has proved that the system can make scientific management decisions according to citrus growth conditions. The single-point multi-layer detection method to obtain temperature, humidity and nutrients is an innovative point of the system.

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