

Smart Irrigation System using Arduino

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ABSTRACT: A smart irrigation system was developed to use water efficiently for agricultural crops. The system has a distributed wireless network of soil moisture and is located in the root zone of the plants. In addition, the gate unit handles sensory information, triggers transmission, and transmits data to the transistor and Arduino channels respectively. The algorithm was developed with the output values of a soil moisture sensor that was programmed into a microcontroller-based gate to control water volume.

KEYWORDS: Smart Irrigation, Relay, Moisture Sensor, Arduino UNO.

I. INTRODUCTION

[1.1] Moisture sensor

Soil moisture sensor is a type of sensor used to measure the amount of water inside a soil. As the precise gravimetric size of the soil moisture requires drying, drying, and weight sampling. These sensors measure volume of water volume and not directly with the help of other ground rules such as dielectric constant, electrical resistance, non-interaction with neutrons, and humidity changes.

The relationship between the calculated structure and the soil moisture must be adjusted and may change based on natural factors such as temperature, soil type, otherwise electrical conductivity. Microwave emissions that appear to be influenced by soil moisture and are widely used in agriculture and remote sensing within hydrology.

[1.2] Relay

The 5V relay is an automatic switch that is commonly used in the automatic control cycle and high-current control using a low current signal. The input voltage of the transmission signal ranges from 0 to 5V.

[1.3] 5V Relay Pin Configuration

The configuration of the 5V transmission pin is shown below. This transfer includes 5 PINs where each PIN and its functionality are shown below.

Pin1 (End 1): Used to open relay; usually one pin is connected to 5Volts while the other is connected to the ground.

Pin2 (Finally 2): This pin is used to open the Relay.

Pin3 (Common (COM)): This PIN is connected to the main Load terminal for activation.

Pin4 (Normally Closed (NC)): This second end of the load is connected to the NC / NO PINs. If this PIN is connected to the upload, it will be OPEN before switching.

Pin5 (Normally On (CHA))

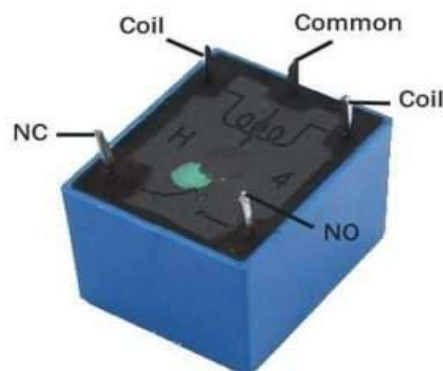


Fig: Single channel 5V Relay



Fig. Soil moisture sensor

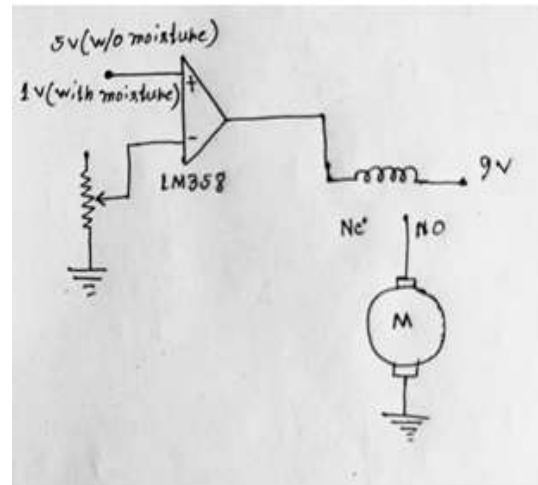


Fig. CIRCUIT DIAGRAM

II. EXPERIMENTATION

This program is a combination of hardware and software. Part of the hardware contains various sensors such as soil moisture sensor while part of the software contains an android-based system connected to the Arduino board and other hardware components that use Internet of Things (IoT). The android-based app contains signals and a site where readings are displayed from sensors and installed using a hardware. This study attempts to make the irrigation system on the farm more automated by monitoring the water level in the soil compared to the crop being planted and the water spraying alternately to mimic the effect of rainfall.

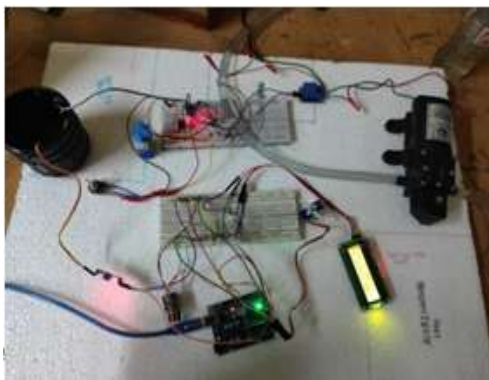


Fig. MODEL

III. CONCLUSION

The smart irrigation system used is very costly to develop water resources for agricultural production. The proposed system can be used to turn on / off the water spray depending on the soil moisture level thus making the process easier to use. Thus, this program is a solution to the problems facing the existing irrigation system.

Some of the advantages of single channel 5v relay

- Allows remote device control. You do not have to be near the device to run.
- Easily change contacts.
- Separates the opening part of the operating part.
- Works well at high temperatures.
- It is activated by low flow; however, it can activate larger power machines.
- With one signal we can control several contacts at once.

Some of the advantages of moisture sensor

- Simple method of measurement.
- It delivers the results immediately.
- very low in cost.
- Offers accurate results.

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