

ARDUINO BASED AUTOMATED WATERING SYSTEM

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Abstract:- In India most of the people are farmers. Agriculture is their soul occupation. So there always comes a need of improvement in the field of agriculture like irrigation.

This project uses Arduino board, which consists of ATmega328 Microcontroller. It is programmed in such a way that it will sense the moisture level of the plants and supply the water if required. This type of system is often used for general plant care, as part of caring for small and large gardens. Normally, the plants need to be watered twice daily, morning and evening. So, the microcontroller has to be coded to water the plants in the greenhouse about two times per day.

Index Terms - Arduino, Microcontroller, Agriculture, Irrigation

1. Introduction

The main aim of this project was to provide water to the plants automatically using microcontroller (arduino uno). During summers, there is shortage of water to the plants and also every time it is not possible for a person to keep a check on the amount of water present in the soil nor he is able to

detect that. Irrigation is the artificial application of water to the land or soil. It is used to assist in the growing of agricultural crops, maintenance of landscapes, and re-vegetation of disturbed soils in dry areas and during periods of inadequate rainfall. When a zone comes on, the water flows through the lateral lines and ultimately ends up at the irrigation emitter (drip) or sprinkler heads. Many sprinklers have pipe thread inlets on the bottom of them which allows a fitting and the pipe to be attached to them. The sprinklers are usually installed with the top of the head flush with the ground surface.

2. Components Used

2.1 Motor (AC)

An AC motor is an [electric motor](#) driven by an [alternating current](#) (AC). The AC motor commonly consists of two basic parts, an outside stationary [stator](#) having coils supplied with alternating current to produce a rotating magnetic field, and an inside [rotor](#) attached to the output shaft producing a second rotating magnetic field. The rotor magnetic field may be produced by permanent magnets, reluctance saliency, or DC or AC electrical windings.

2.2 Relay

A relay is an [electrically](#) operated [switch](#). Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal.

2.3 Soil Sensor

Soil sensor can be used to detect the moisture of soil or judge if there is water around the sensor.

2.4 Microcontroller

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller.

2.5 Connecting Leads

These are used for connecting electrical components.

2.6 Pipe

Here it is used as a water channel.

3. Working

An automatic plant watering system using microcontroller ATMEGA328P is programmed such that it gives the interrupt signals to the motor via the relay. Soil sensor is connected to the Arduino board which senses the moisture content present in the soil. Whenever there is a change in the moisture content of the soil, the sensor senses the change, giving signal to the microcontroller so that the pump(motor) can be activated. This concept can be used for automatic irrigation system.

4. Block Diagram

There are two functional components in this project. They are the moisture sensors and the motor/water pump. Thus the Arduino Board is programmed using the Arduino IDE software. The function of the moisture sensor is to sense the level of moisture in the soil. The motor/water pump supplies water to the plants.



This project uses Arduino Uno to controls the motor. Follow the schematic to connect the Arduino to the motor driver, and the driver to the water pump. The motor can be driven by a 9 volt battery, and current measurements show us that battery life. The Arduino Board is programmed using the Arduino IDE software. The moisture sensor measures the level of moisture in the soil and sends the signal to the Arduino

- One can take care of their plants when they are not at their home.

if watering is required. The motor/water pump supplies water to the plants until the desired moisture level is reached.

5. Need of Automatic Plant Watering System

Automatic irrigation systems are convenient especially for those who travel. If installed and programmed properly, automatic irrigation systems can save our money and help in water conservation. Automatic irrigation systems can be programmed to discharge more precise amount of water in a targeted area, which promotes water conservation.

6. Advantages

- This system can be used to save water
- Saves time

7. Conclusion

The system provides with several benefits and can be operated with less manpower. The system supplies water only when the humidity in the soil goes below the reference. Due to the direct transfer of water to the roots water conservation takes place. Thus the system is efficient and compatible to changing environment.

8. References

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