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Arduino Based Automatic Plant Watering System for Home Garden

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ABSTRACT: In today's technical era use of automated systems are ruling the world. There is a lot of demand for task oriented small automated systems that can ease the human efforts. Technological advances allows us to predict certain conditions and permit us to take certain decisions. This arduino based automatic watering system senses the moisture content of the soil and depending upon whether the soil is moist or dry automatically switches the pump off or on respectively. In the present study, we have used soil sensor, arduino uno R3 ATmega328P board, 18 W submersible pump and 4 channel relay.

KEYWORDS: Arduino, Plantation systems, Automatic systems, Soil moisture sensor, Relay.

I. INTRODUCTION

In the current world of urbanization, proper watering to the garden or indoor plants is a concern issue. Irrigating plants at regular interval is very important. One of the most common artificial way of watering is irrigation. Now a days, it is major issue of watering the home garden in our absence at home. This automatic watering system can water the plants in our absence. Just by sensing the moist in the soil, we can design a system that can switch on the submersible pump if soil is dry. The designed irrigation system can also be used on large scale with proper planning and extending the components used in the current system. Lot of research articles are available on the current problem [1-3] but there are very less reports on gardening the indoor plants. The major advantage of the system is saving the water as well as wastes of electricity.

II. SYSTEM SPECIFICATIONS

2.1. Arduino uno R3 ATmega328P board

This is the main part of the system which controls all the functions. The proper programming is essential for the working of the system. The Arduino is programmed using Arduino IDE 2.0.4 software. The program takes input from soil sensor and according sends instruction to the hardware for the proper action. Chawla et. al reported similar assembly for the automatic watering system[4].

2.2 Arduino IDE 2.0.4 Program

```
int wat;
void setup() {
  pinMode(3,OUTPUT); //output pin for relay board
  pinMode(6,INPUT); //input pin from soil sensor
}
void loop() {
  wat = digitalRead(6); // read the signal from the soil sensor
  if(wat == HIGH) // if water level is full - cut the relay
  {
    digitalWrite(3,LOW); // low - cut the relay
  }
  else
  {
    digitalWrite(3,HIGH); //high to continue proving signal and water supply
  } delay(400);
}
```

2.3 Soil sensor

The soil sensor gives input to the arduino microcontroller depending upon the soil condition. i.e. whether the soil is dry or wet.

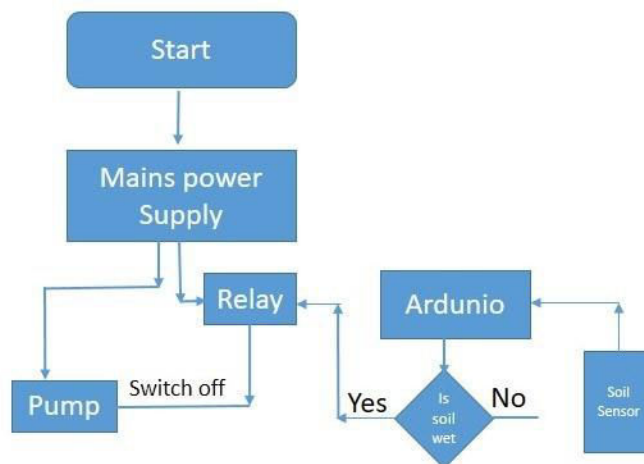
2.3 Relay

The relay is an electronic device which is connected to both the arduino board as well as submersible pump. It only connects or cuts the main supply to submersible pump depending upon the soil sensor input.

2.4 Submersible Pump

The submersible pump is kept in water. The capacity of pump may vary depending upon application or requirement. For this project we have used 18W AC submersible pump. All the product used in this project are used as received from the manufacturer or supplier.

III. FLOW CHART



IV. WORKING

The soil sensor used senses the soil and depending upon soil condition (dry or wet) gives input to the Arduino microcontroller. The microcontroller program checks the input and gives the signal to relay. If the soil is dry, the relays continues the power supply to the water pump otherwise if soil is wet, the relay cutoff the power supply and water pump stops. To get proper watering to the plant the home garden should be designed in such a way that soil sensor becomes wet when all plants in the garden are watered. The system can be used to water the plants in pot. The plant pots should be mounted in a proper way such that the sensor can be kept in the last pot.

V. CONCLUSION

The automatic plant watering system can be designed using Arduino Uno Microcontroller. The present research showed that wastage of water and electricity can be avoided using current system. With a proper arrangement of plants in the garden it is possible to water the plant in the absence of person.

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