SENSORS AND INSTRUMENTATION

SENSORS PROJECT ON **Automatic Watering System for Plants using Arduino**

ABOUT US AND FACULTY

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COMPONENTS

- ARDUIN0 UN0 R3
- SOIL MOISTURE SENSOR with YL-38 Circuit board
- 1 CHANNEL RELAY MODULE
- 2-9V BATTERIES
- 9V DC WATER MOTOR PUMP
- JUMPER WIRES

SOFTWARE:

ARDUINO

ABOUT COMPONENTS

- ARDUINO UNO R3:The Arduino Uno is a microcontroller board based on the ATmega328. It has 20 digital input/output pins (of which 6 can be used as PWM outputs and 6 can be used as analog inputs), a 16 MHz resonator, a USB connection, a power jack, an in-circuit system programming (ICSP) header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer (or appropriate wall power adapter) with a USB cable or power it with a AC-to-DC adapter or battery to get started.
- SPARKFUN SOIL MOISTURE SENSOR : Spark Fun Soil Moisture Sensor is a simple breakout for measuring the moisture in soil and similar materials. The soil moisture sensor is pretty straightforward to use. The two large, exposed pads function as probes for the sensor, together acting as a variable resistor. The more water that is in the soil means the better the conductivity between the pads will be, resulting in a lower resistance and a higher SIG out. This version of the Soil Moisture Sensor includes a 3-pin screw pin terminal pre-soldered to the board for easy wiring and setup.

ABOUT COMPONENTS

- 1CHANNEL RELAY MODULE:A relay is an electrically operated device. It has a control system and (also called input circuit or input contactor) and controlled system (also called output circuit or output cont actor). It is frequently used in automatic control circuit. To put it simply, it is an automatic switch to controlling a high-current circuit with a low-current signal.

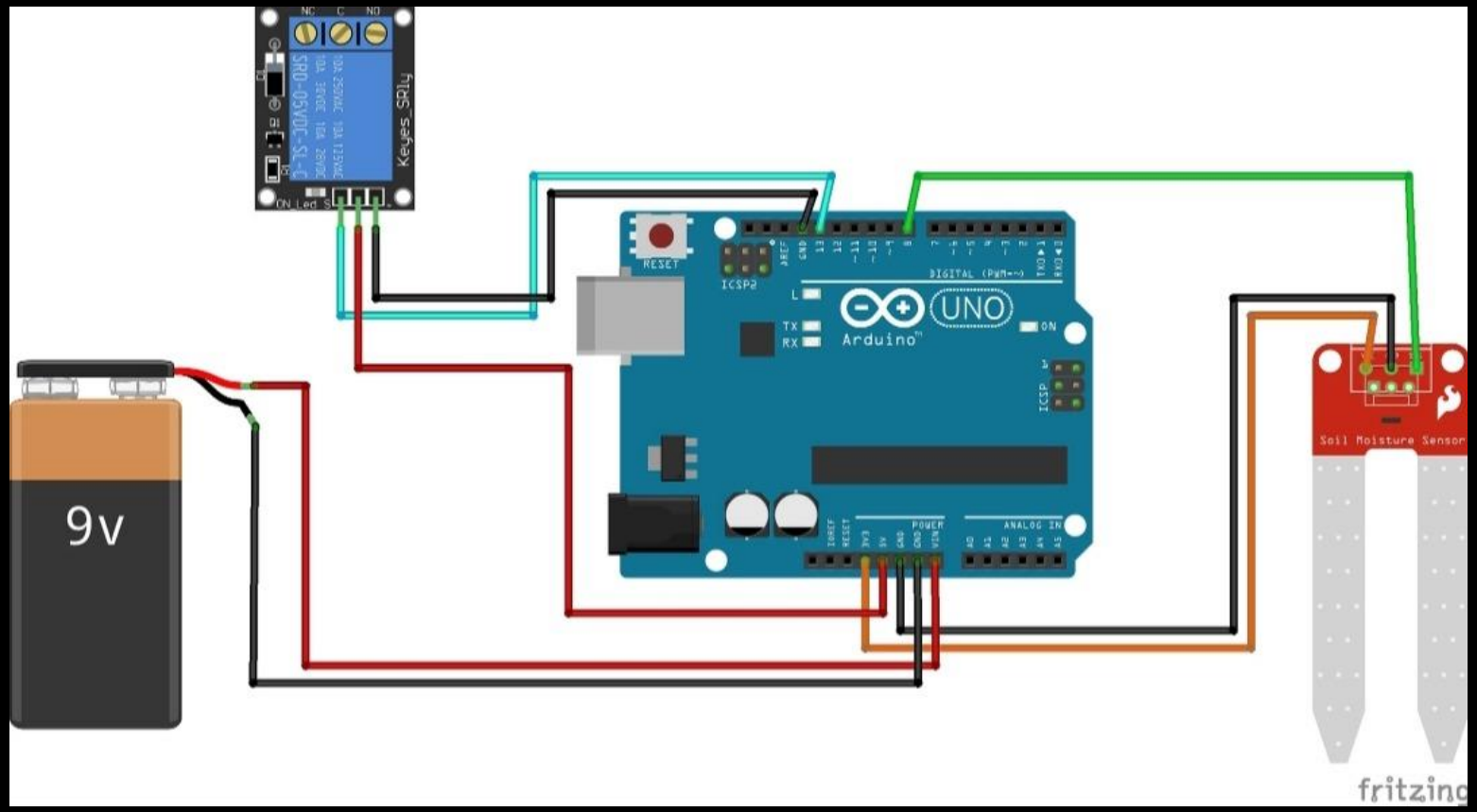
- 9V DC WATER MOTOR PUMP: it is pump which is inserted in a water to give some air supply

PHOTOS OF COMPONENTS

WORKING PROCESS

- Lets take three different types of mud which it has without water , slightly water is there ,normal level of water is there , more water is there.
- Lets take the moisture sensor and dip or insert in the four different types of mud layers.
- Note the value of moisture we get from that mud.
- After evaluation , compare the moisture level from four different types of mud.
- We get that if there is more water than the moisture is very less and if the eater is not there then the moisture is more.
- By using that, we can use the detection of moisture in the sand.

CIRCUIT DIAGRAM



CODE

```
int ACWATERPUMP = 13; //You can remove this line, it has no use in the program.
int sensor = 8; //You can remove this line, it has no use in the program.
int val; //This variable stores the value received from Soil moisture sensor.
void setup() {
  pinMode(13,OUTPUT); //Set pin 13 as OUTPUT pin, to send signal to relay
  pinMode(8,INPUT); //Set pin 8 as input pin, to receive data from Soil moisture sensor.
}

void loop() {
  val = digitalRead(8);  //Read data from soil moisture sensor
  if(val == LOW)
  {
  digitalWrite(13,LOW); //if soil moisture sensor provides LOW value send LOW value to relay
  }
  else
  {
  digitalWrite(13,HIGH); //if soil moisture sensor provides HIGH value send HIGH value to relay
  }
  delay(400); //Wait for few second and then continue the loop.
}
```

CONCLUSION OF THIS PROJECT

- It is useful for agricultural purpose because the plant will actually survive in given humidity for enrich it nutrients . If we use this equipment we can detect the certain level of moisture which is useful for plant cultivation and it will be easy way to get the what crop is better for that land by detecting the land humidity.
- Moisture is inversely proportional to the level of water.

REFERENCES

- Most of the written we have with our own effort and only imported images from the following link:
- http://www.learnbywatch.com/automatic-watering-system-for-plants-using-arduino/