SOIL MOISTURE SENSOR

MSE-I

Submitted by:

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SOIL MOISTURE SENSOR

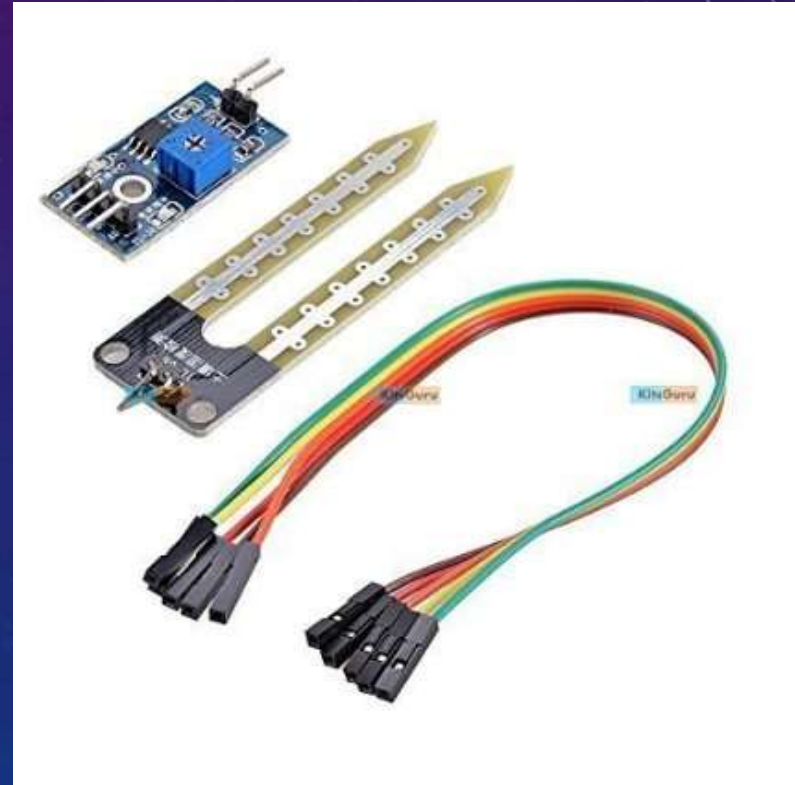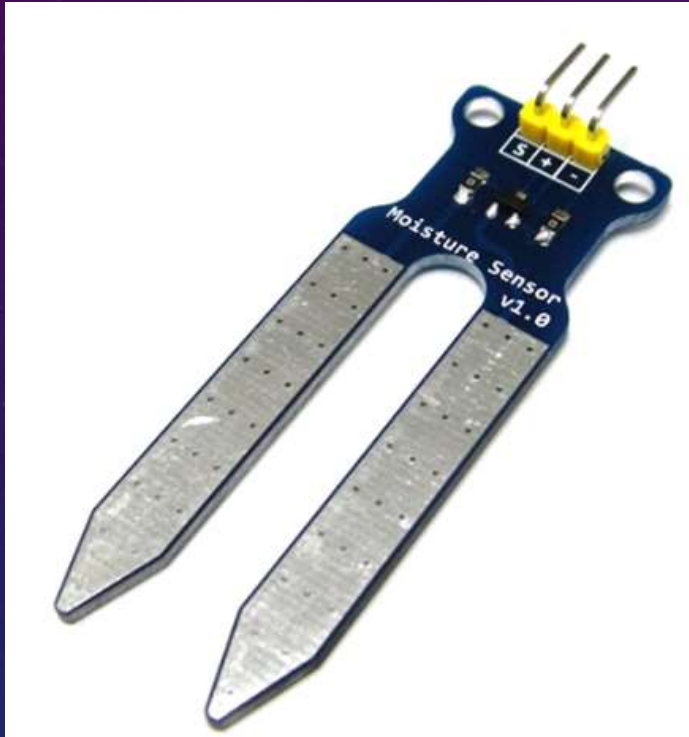Fig 1: Soil Moisture Sensor (Ref)

INTRODUCTION

❑ Soil Moisture Sensor as the name suggest ,can detect amount of moisture in soil (roots of a plant).

❑ It is Low-Tech sensor.

❑ This sensor is compatible with Arduino UNO,Arduino mega2560, Arduino ADK etc.

WORKING PRINCIPLE

- Strictly Speaking moisture sensor **does not measures moisture** but measures conductivity or resistivity of soil.

- Moisture Sensor has two probes to pass current through the soil. It then reads resistance(conductance) in the soil.

- Less moisture (water) in soil results in higher resistance i.e. dry soil.

- More moisture (water) in soil results in lesser resistance and sensor thus relates moisture content.

FEATURES

❑This sensor has low power consumption, and high sensitivity. (**Sensitivity should not be confused with accuracy**)

❑Operates on low Voltage of 5v.

❑Operates on low current <20mA.

❑Weighs only 3 gram.

DISADVANTAGES

- Depth of detection is only 37mm.
- Working temperature is only 10˚-30˚ Celsius.
- Less accuracy.

PIN DEFINITIONS

❑ Pin with "S" written on it means signal.

❑ Pin with "-" written on it means GND (ground) .
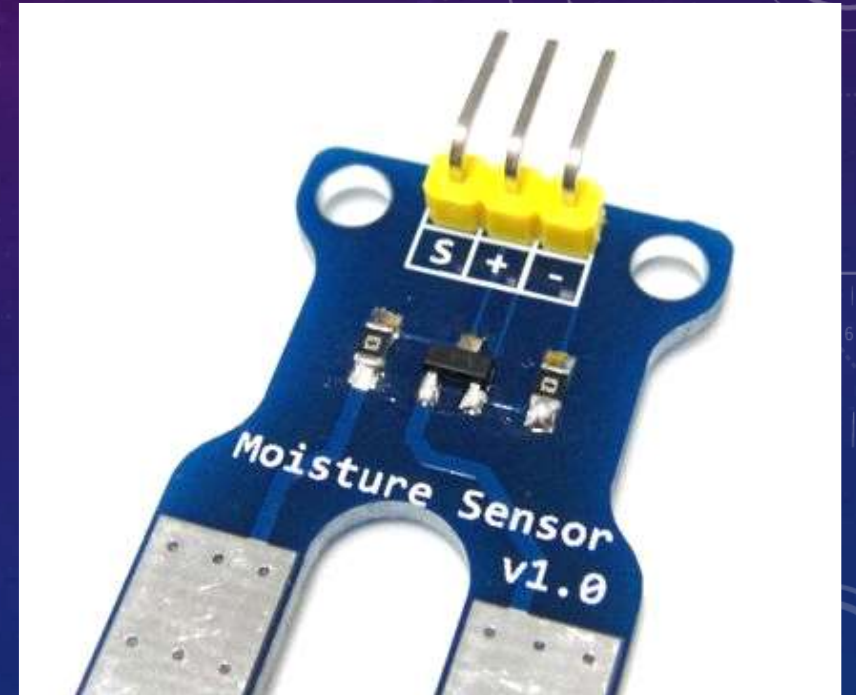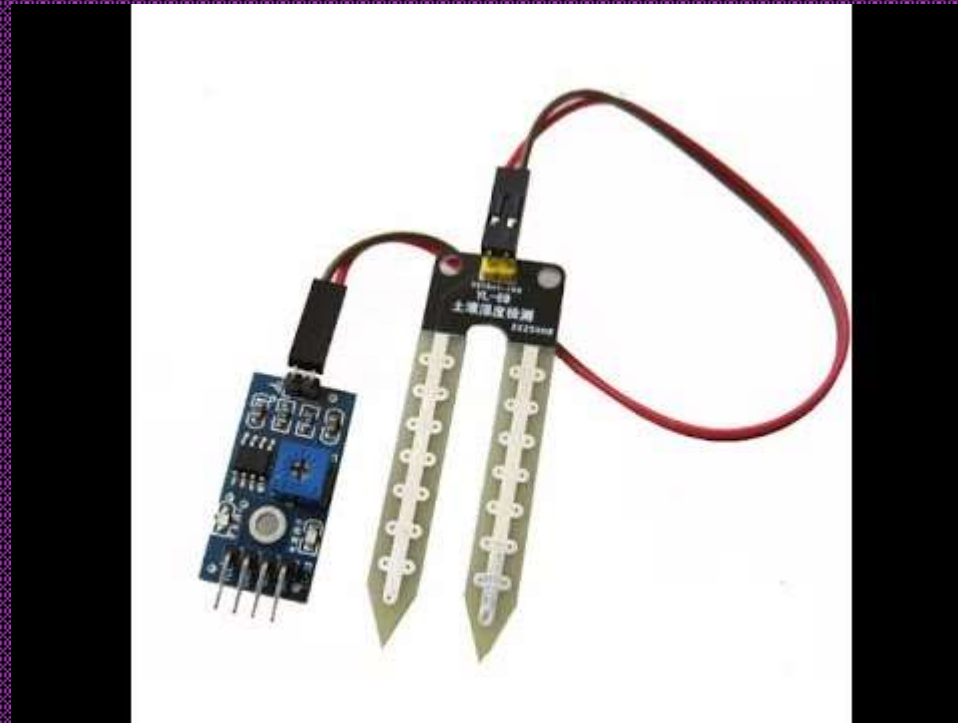
❑ Pin with "+" written on it means 5v supply.

Fig 2.1: Soil Moisture Sensor Pins (Ref)

YL69(PROBES) CONNECTED TO YL38 (INTERFACE)

Cost = 130 INR

This is what I will be using while Showing Demo.

Fig 2.2: Soil Moisture Sensor unit (Ref)
Yl38 (Interface) and Yl69 (Probes)

YL-69 MOISTURE SENSOR (PROBES)

- This is an Electrical resistance Sensor. The sensor is made up of two electrodes. This soil moisture sensor reads the moisture content around it. A current is passed across the electrodes through the soil and the resistance to the current in the soil determines the soil moisture. If the soil has more water resistance will be low and thus more current will pass through. On the other hand when the soil moisture is low the sensor module outputs a high level of resistance.

- This sensor has both digital and analogue outputs. Digital output is simple to use but is not as accurate as the analogue output.

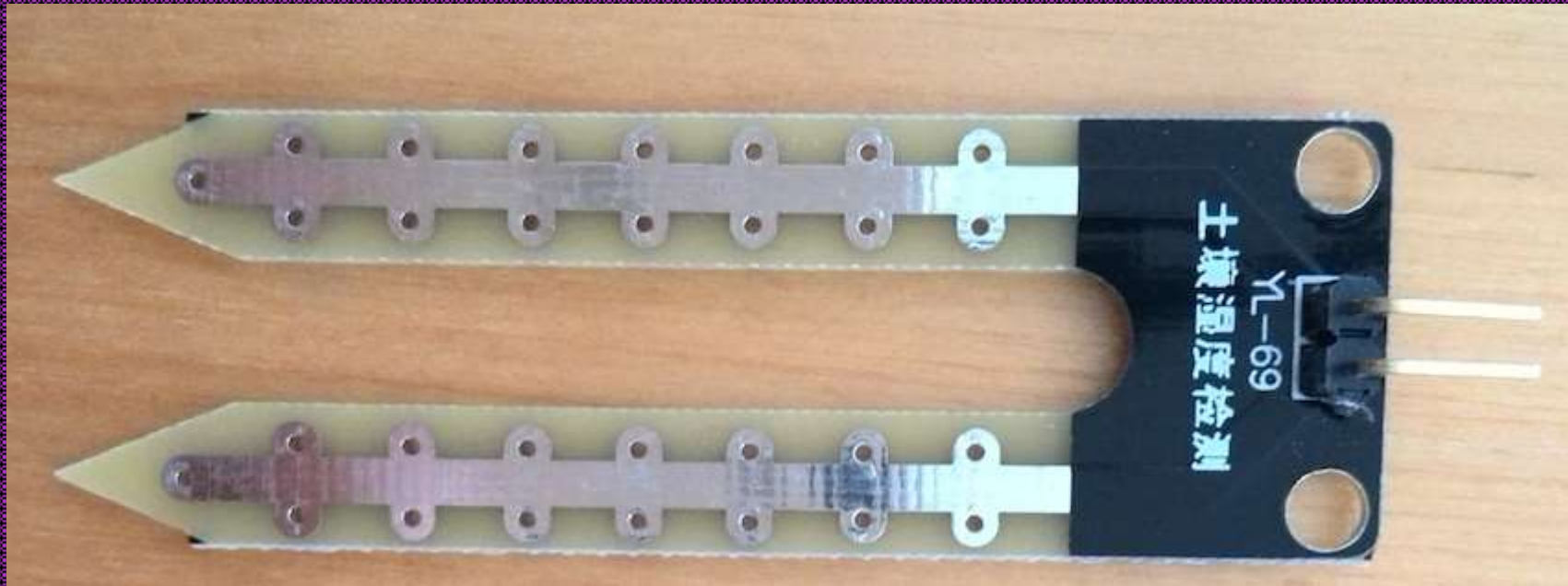| Vcc power supply	3.3V or 5V
Current	35mA
Signal output voltage	0-4.2V
Digital Outputs	0 or 1
Analog	Resistance (Ω)
GND	Connected to ground

YL-69 MOISTURE SENSOR(PROBES)

Fig 2.2.1: YL-69 (Probes)

YL - 38 INTERFACE FOR YL-69 PROBES

- The sensor comes with a small PCB board fitted with LM393 comparator chip and a potentiometer.

- Output signal Pins (Both Analog and Digital).

- Input Power pins for the sensor is also present on this PCB.

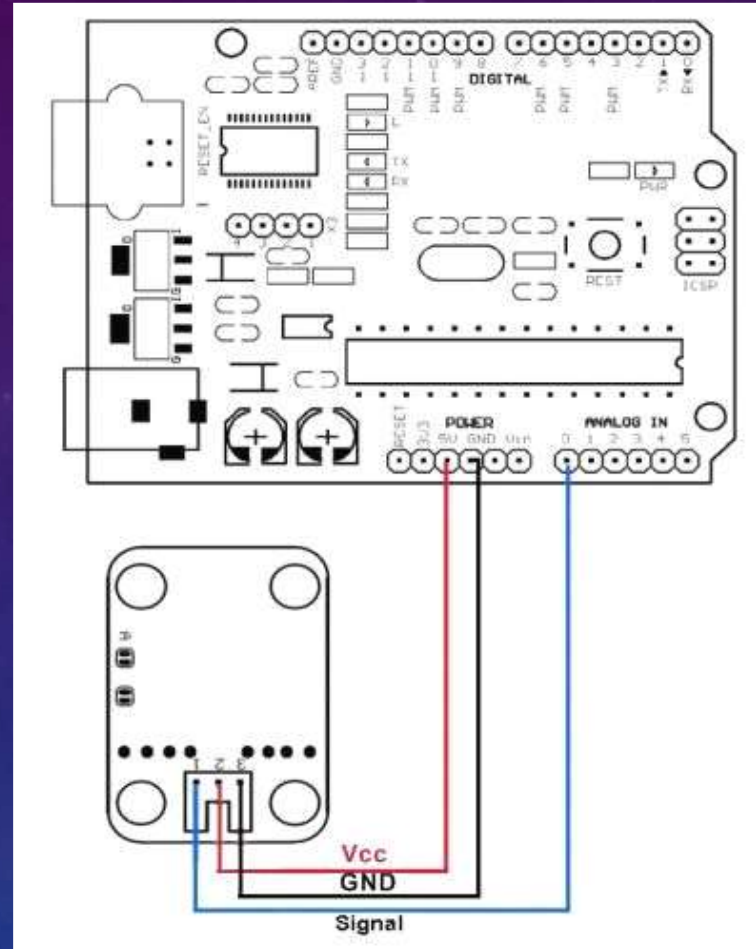Fig 2.2.2: YL-38 (Interface)

CONNECTING DIAGRAM

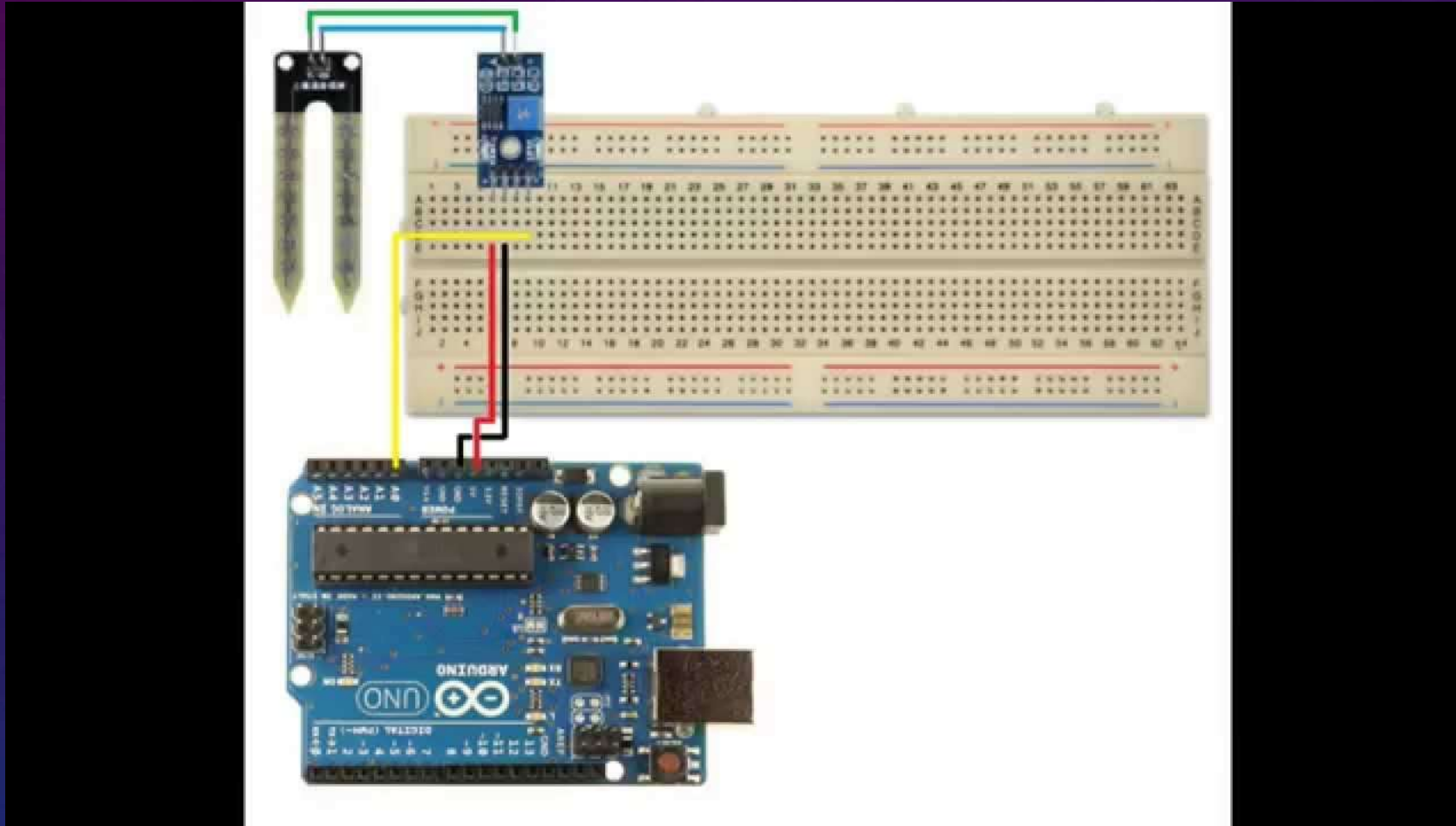Fig 3.1: Soil Moisture Sensor connected to Arduino (Ref)

PICTOGRAPHIC REPRESENTATION

Fig 3.2: Soil Moisture Sensor connected to Arduino (Ref)

HARDWARE REQUIRED

❑ Arduino UNO(Fig 4)

❑ Soil Moisture Sensor(Fig 5)

❑ 3 Pin Dual Female Jumper wire(Fig 6)

❑ Sensor shield (Optional, not required)

Fig 4:Arduino UNO (Ref)

Fig 5:Soil Moisture Sensor (Ref)

Fig 6:Female Jumper Wire(Ref)

SIMPLE BASIC SKETCH-1

- void setup() {

-   // put your setup code here, to run once:

-   // initialize serial communication at 9600 bits per second:

-   Serial.begin(9600);

- }

- void loop() {

-   // put your main code here, to run repeatedly:

-   // read the input on analog pin 0:

-   int sensorValue = analogRead(A0); Serial.println(sensorValue);

-   delay(100);

- }

SIMPLE BASIC SKETCH-2

```
void setup() {

Serial.begin(9600);

}

void loop(){

if(analogRead(A0)<300){

Serial.println("I feel so comfortable");

}

if(analogRead(A0)>300 && analogRead(5)<700){

Serial.println("I am thirsty ,please give me water");

}

if(analogRead(A0)>700){

Serial.println("Too much water,I might get hurt");

}

delay(200);

}
```
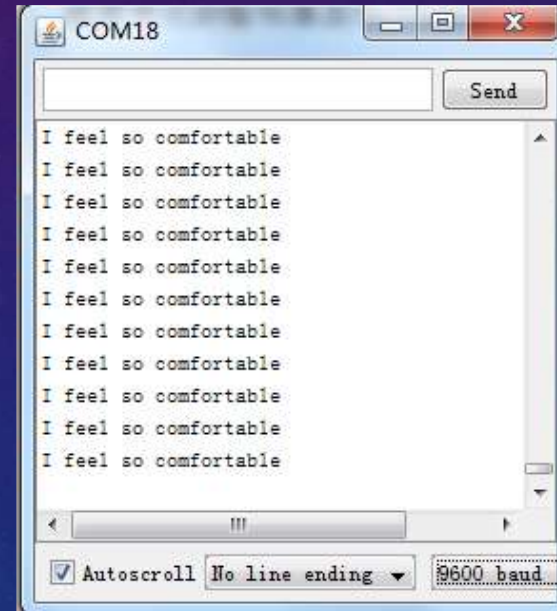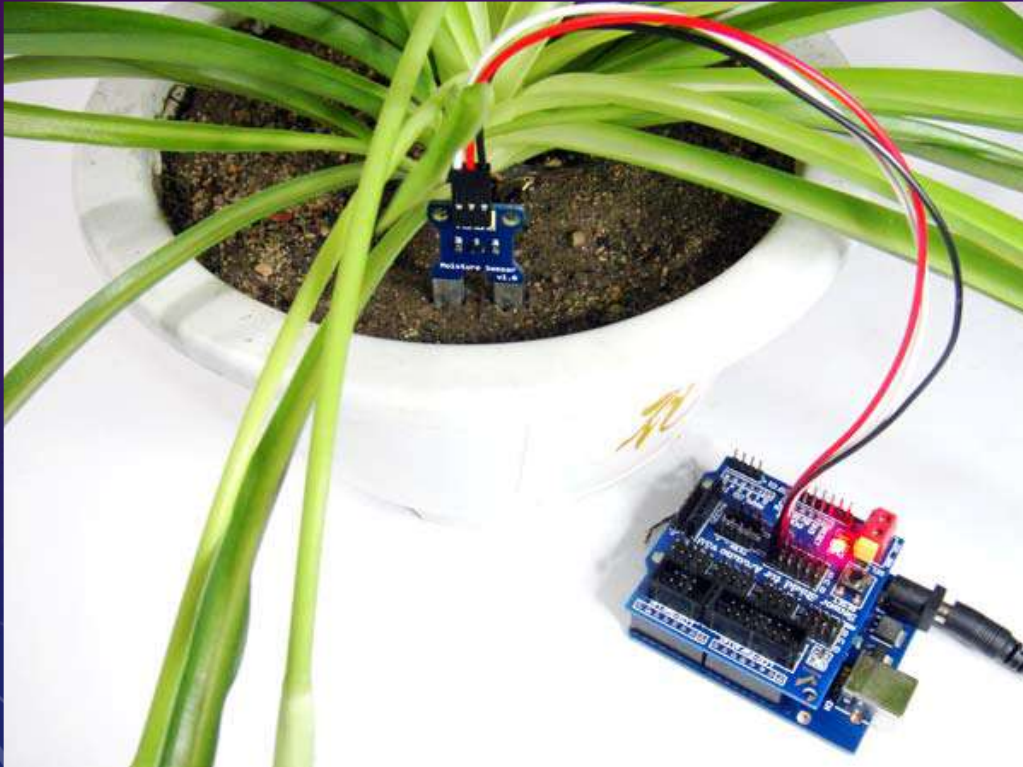
TEST RESULTS:
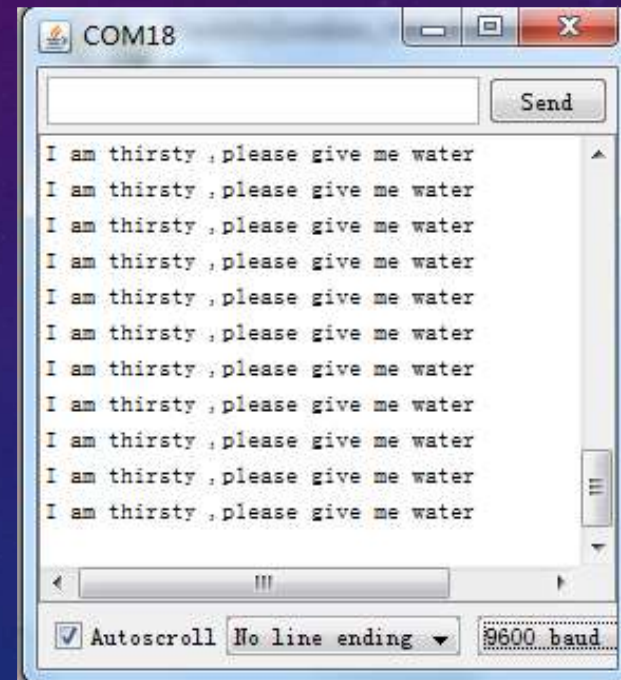
- Moisture content is less in soil.
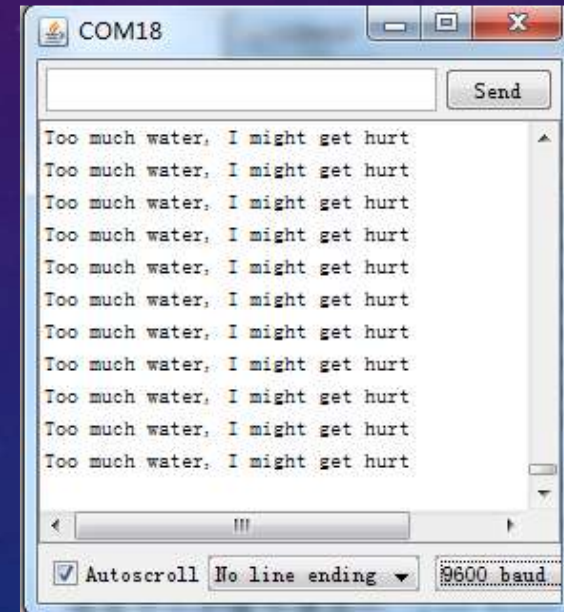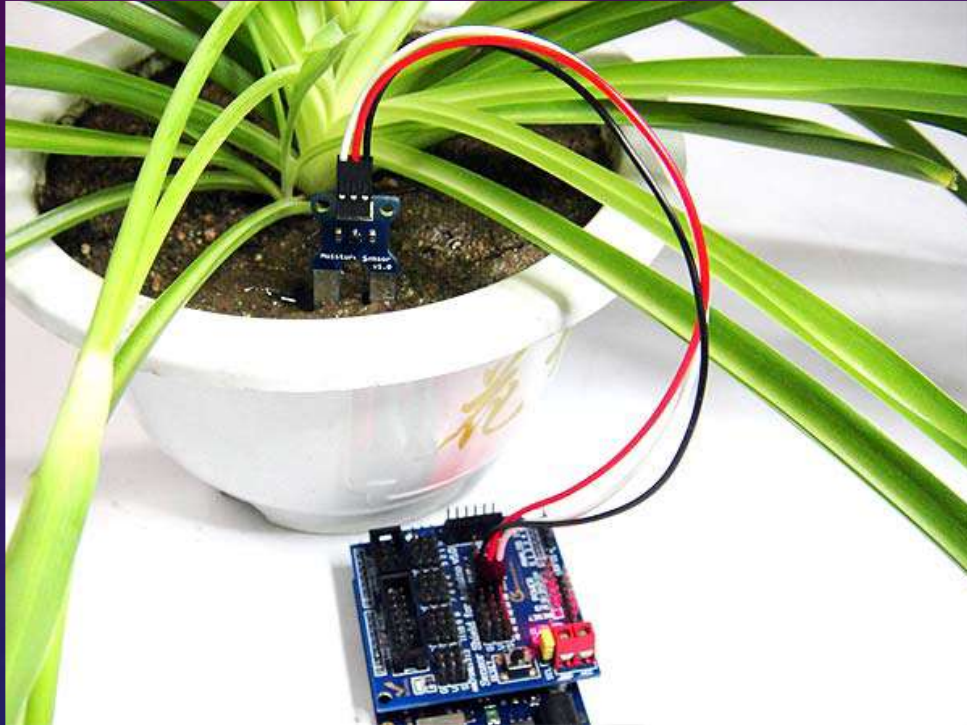
TEST RESULTS CONTINUE:

After watering :

- Moisture content is within the range in soil.

TEST RESULTS CONTINUE:

Adding more water :

- Moisture content is out of range in soil.

REFERENCE

S.No.	LINK
1.	http://www.fut-electronics.com/wp-content/plugins/fe_downloads/Uploads/moisture-sensor-arduino.pdf
2.	http://lowtech.propositions.org.uk/lowtech-sensors-and-actuators.pdf
3.	https://arduino-info.wikispaces.com/SensorShield

THANK YOU ☺

- Keep Experimenting ☺
- Keep Loving Open Source.