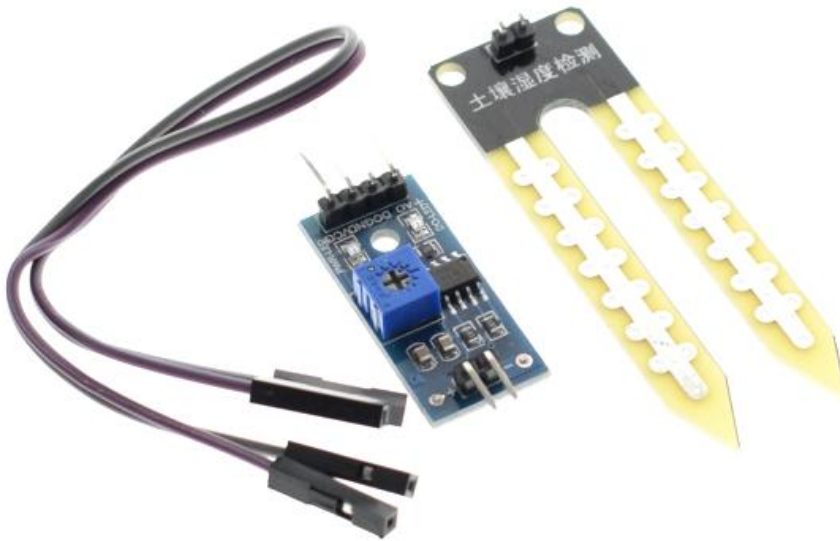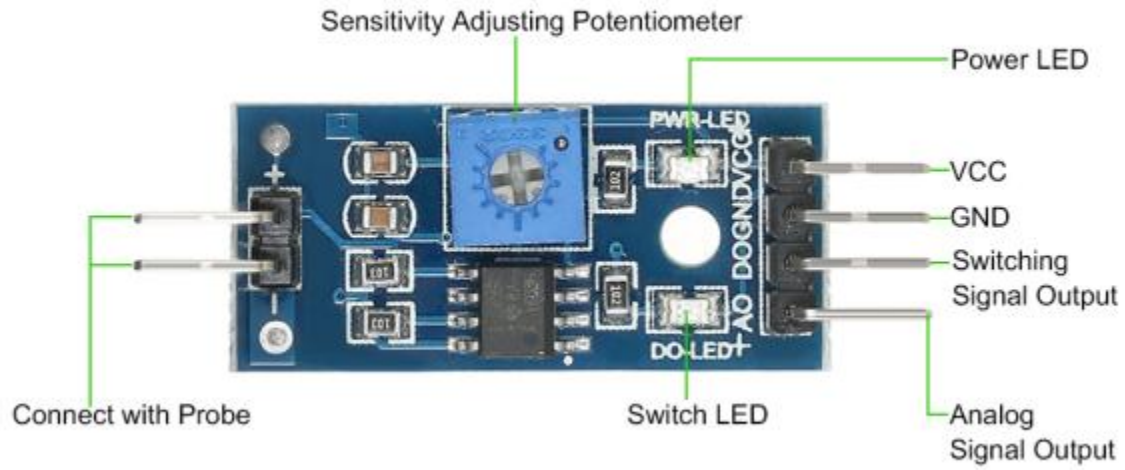# Soil Moisture Sensor Module

The soil moisture sensor or the hygrometer is usually used to detect the humidity of the soil. So, it is perfect to build an automatic watering system or to monitor the soil moisture of your plants. The sensor is set up by two pieces: the electronic board and the sensor probe with two pads, that detects the water content.
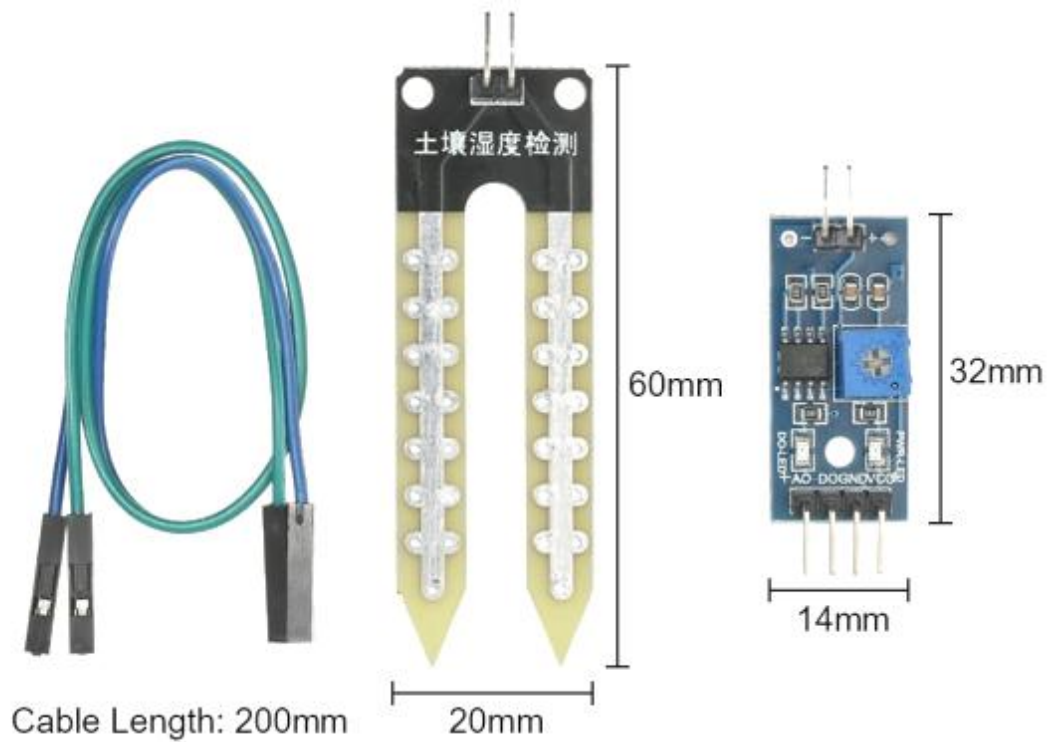

Description:

- Interface: 4-Wire.
- Operating Voltage: 3.3V~5Vdc.
- Output: Digital and Analogue.
- Cable Length: ~21cm.
- Panel PCB Dimension: 3cm x 1.5cm.
- Soil Probe Dimension: 6cm x 3cm.

Connection Pins Assignment:

Sensitivity Adjusting Potentiometer

Power LED

VCC

GND

Switching Signal Output

Connect with Probe

Switch LED

Analog Signal Output

Mechanical Dimension:

Unit: mm

土壤湿度检测

60mm

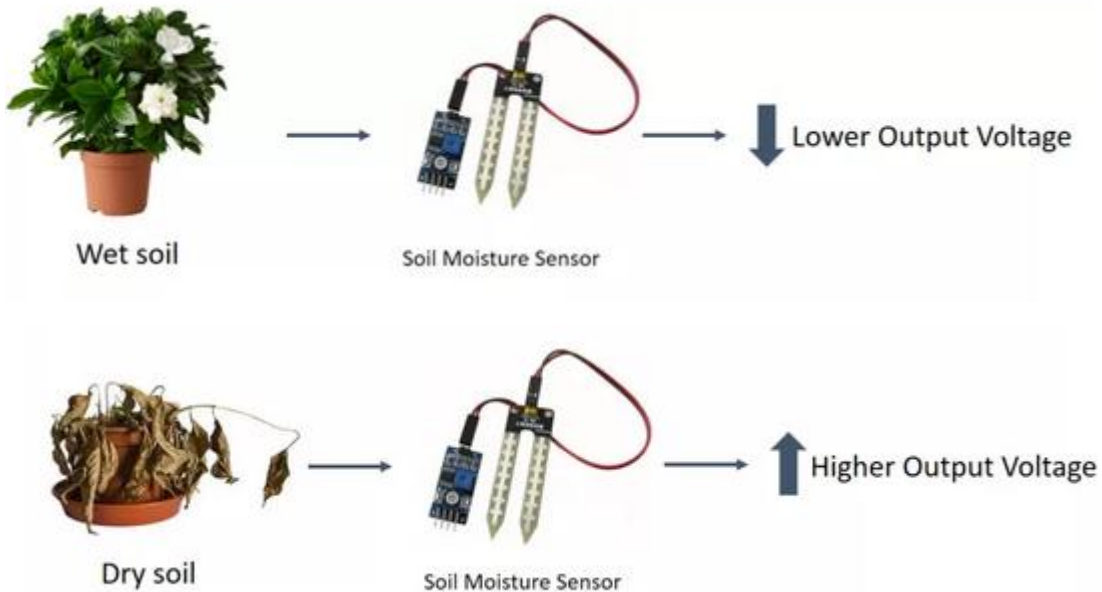32mm

14mm

Cable Length: 200mm

20mm

How does it work?

The voltage that the sensor outputs changes accordingly to the water content in the soil.

When the soil is:

- Wet: the output voltage decreases.
- Dry: the output voltage increases.

Wet soil → Soil Moisture Sensor → Lower Output Voltage

Dry soil → Soil Moisture Sensor → Higher Output Voltage

The output can be a digital signal (D0) LOW or HIGH, depending on the water content. If the soil humidity exceeds a certain predefined threshold value, the modules outputs LOW, otherwise it outputs HIGH. The threshold value for the digital signal can be adjusted using the on-board potentiometer. The output can be a analog signal and so you'll get a value between 0 and 1023.

Application Examples with Arduino:

Connect up the sensor to Arduino Uno board as shown in below schematic:

fritzing
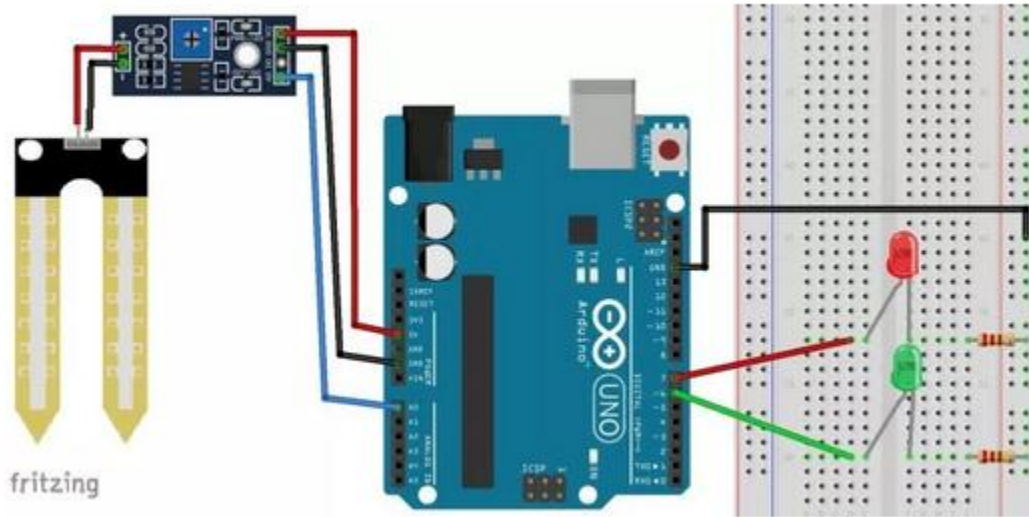
Pin	Wiring to Arduino Uno
A0	Analog Pins
D0	Digital Pins
GND	GND
VCC	5V

Arduino Sketch:

Upload the following sketch to your Arduino board:

```
/*

//  Project     : Soil Moisture Sensor with Arduino Uno
//  Source-Code : Soil_Moisture.ino
//=============================================================================
*/

int rainPin = A0;
int greenLED = 6;
int redLED = 7;
// you can adjust the threshold value
int thresholdValue = 800;

void setup(){
```

```
  pinMode(rainPin, INPUT);
  pinMode(greenLED, OUTPUT);
  pinMode(redLED, OUTPUT);
  digitalWrite(greenLED, LOW);
  digitalWrite(redLED, LOW);
  Serial.begin(9600);
}

void loop() {
  // read the input on analog pin 0:
  int sensorValue = analogRead(rainPin);
  Serial.print(sensorValue);
  if(sensorValue < thresholdValue){
    Serial.println(" - Doesn't need watering");
    digitalWrite(redLED, LOW);
    digitalWrite(greenLED, HIGH);
  }
  else {
    Serial.println(" - Time to water your plant");
    digitalWrite(redLED, HIGH);
    digitalWrite(greenLED, LOW);
  }
  delay(500);
}
```

Open the Arduino IDE serial monitor to see the values. Then, try your sensor in a wet and in a dry soil and see what happens. When the analog value goes above a certain threshold, a red LED will turn on (indicates that the plant needs watering), and when the value goes below a certain threshold, a green LED will turn on (indicates that the plant is ok).

The moisture sensor allows to monitor the water content in the soil. This is useful if you want to build an automatic watering system. You can also use it to just monitor your plants soil moisture.