MANUAL IOT
MOISTURE SENSOR WITH LED

Hello Creatives,
In this manual, I will show you how to make a system that tells you if the plant needs water using the NodeMCU board, a moisture sensor and two LED lights.

HOW IT WORKS

The Smart Planter uses a LED light to show you when the plant needs water. If the soil is moisture (above 19%) the planter is green, using the green LED light. If the soil is dry (below 19%), the planter will turn red using the red LED light.

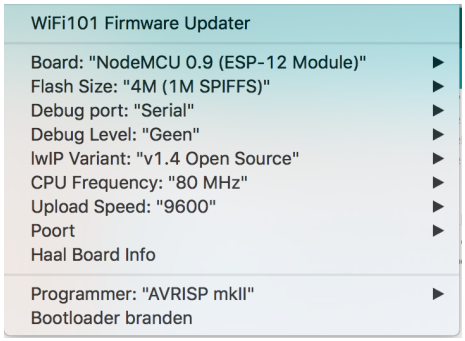
THE COMPONENTS

HARDWARE
- NodeMCU
- Moisture Sensor (bodem hygrometer)
- LED light (RGB) 2X
- Jumper Wires 7X
- Micro USB Cable

SOFTWARE
- Arduino IDE software

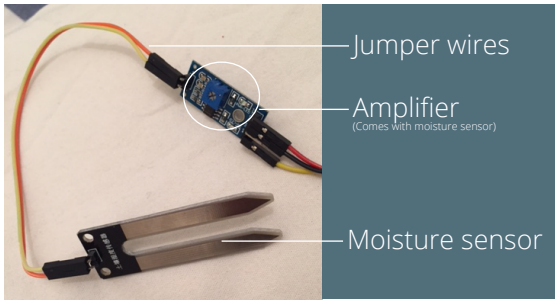
INSTALLING ARDUINO IDE SOFTWARE

First install the IDE Arduino software here https://www.arduino.cc/en/Main/Software. Second connect your NodeMCU board via usb cable to your PC than upload the “blink.ino” sketch to your NodeMCU. For the Arduino settings see screenshot below:

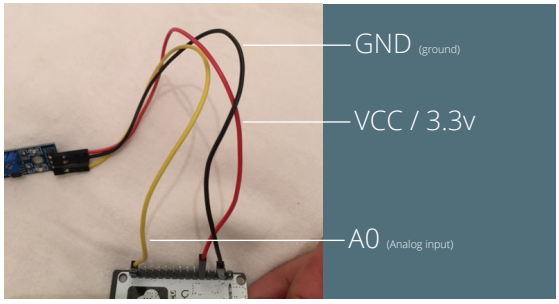


CONNECTING THE HARDWARE COMPONENTS

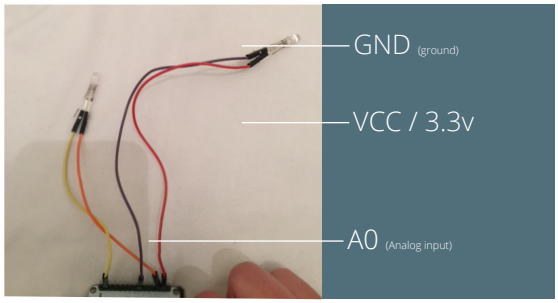
Step 1: Connect the two pins on the Amplifier to the two pins on the Moisture Sensor using the Jumper Wires.

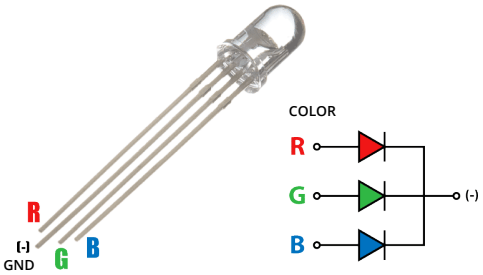


Step 2: Connect the 3.3V pin on the NodeMCU to the Vcc from the Amplifier, the GND pin of the Moisture Sensor to the ground pin on the NodeMCU and the A0 pin on the NodeMCU to the Analog pin on the moisture sensor.

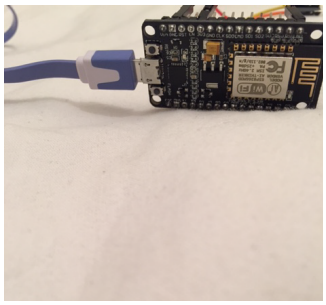


Step 5: Connect the Green LED to pin D1 on your NodeMCU and the Red LED to pin D2 using the jumper wires. Than connect the wires connected to ground on your RGB LED to the GND pin (ground) on your NodeMCU.





Step 6: The final step is connecting the USB cable to your NodeMCU and USB poort on your PC.



Now it's time to write the code ;)!

WRITING THE CODE

```
int moisturePin = A0; // Analog INPUT Moisture Sensor
int moistureValue;   // OUTPUT variable to store sensor value
int ledGreen = D1;   // Digital OUTPUT red LED
int ledRed = D2;   // Digital OUTPUT green LED

void setup() {
  pinMode(D1, OUTPUT);  // declare red LED as output
  pinMode(D2, OUTPUT);  // declare green LED as output
  Serial.begin(9600);  // start the serial port
  Serial.println("Reading sensor ...");
  delay(2000);
  }
```

```
void loop() {

  moistureValue = analogRead(moisturePin);
/*
SOURCE: https://diyhacking.com/arduino-soil-moisture-sensor/
 */
  moistureValue = map(moistureValue,415,0,0,100); // map values from 0 to 100
  Serial.print("Moisture : ");
  Serial.print(moistureValue); // print the measured value
  Serial.println("%");
  delay(1000);

if(moistureValue < 19) { // switch on red LED if moisture level is low
digitalWrite(D1, HIGH);
digitalWrite(D2, LOW);
} else if (moistureValue > 19) { // switch on green led when moisture level is high
digitalWrite(D2, HIGH);
digitalWrite(D1, LOW);
}
delay(100);
  }
```

EXPLAINING THE CODE

If you want to use a different value for the LED state than here is what you do: connect the moisture sensor to your NodeMCU, upload the sketch whithout the LED variables and delete the map function so that your left with only the code to read the sensor value. Put the moisture sensor in a little bit of water to get the highest value the sensor can reach. Once you measured its highest value you can calculate the range in wich the LED's will have to respond and overwrite the value in your "if else" statement .
The moisture sensor reads a value between 0 to 1023 in percentage. I mapped this value to a range of 0 to 100. You don't necessarily have to do this. I just think the code looks more clean and it helps me calculate more easily.