

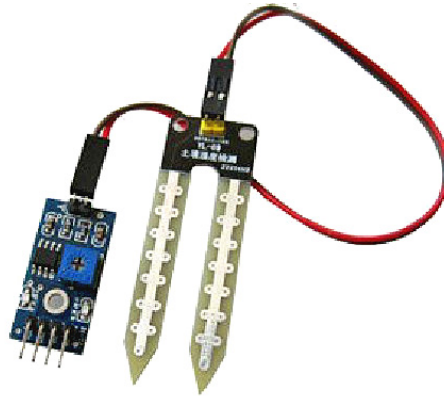
INTERFACING SENSORS WITH ARDUINO

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#1. Interfacing Soil Moisture Sensor with Arduino :-

About the Sensor : A **Soil moisture sensor** is a device used to measure **moisture** levels in **soil** for purposes like irrigation control and scientific research.



Connection :

<i>Sensor</i>	<i>Arduino</i>
Vcc	3.3 v or 5 v
Gnd	Gnd
A0	A0

Code :

```
int output_value ;

void setup()
{
  Serial.begin(9600);
  Serial.println("Reading From the Sensor ...");
  delay(2000);
}

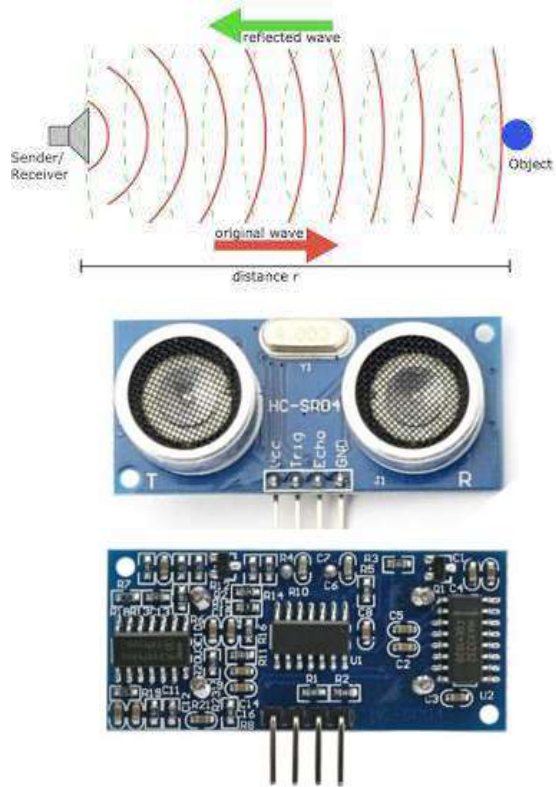
void loop()
{
  output_value= analogRead(A0);
  output_value = map(output_value,550,0,0,100);
  Serial.print("Mositure : ");
  Serial.print(output_value);
  Serial.println("%");
  delay(1000);
}
```

Explanation :

Once the code is uploaded, open your Serial Monitor to see the output. Just insert the soil moisture sensor partially into the soil to get a good output. You can also modify this code and run the device as per your wish.

#2. Interfacing Ultrasonic sensor with Arduino :-

About the sensor : The **HC-SR04 ultrasonic sensor** uses **SONAR** to determine the distance of an object just like the bats do. This sensor is mostly used to calculate the distance between objects.



Connection :

<i>Sensor</i>	<i>Arduino</i>
Vcc	5 v
Gnd	Gnd
Trig	Digital pin 7
Echo	Digital pin 6

Code :

```
#define trigPin 7
#define echoPin 6

void setup() {
  pinMode(trigPin, OUTPUT);
  pinMode(echoPin, INPUT);
  Serial.begin(9600);
}

void loop() {

  int duration, distance;
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(100);
  digitalWrite(trigPin, LOW);
  duration = pulseIn(echoPin, HIGH);
  distance = (duration / 2) / 29.1;
  Serial.print("Distance : ");
  Serial.print(distance);
  Serial.print("cm");
}
```

Explanation :

Once the code is uploaded, open your Serial Monitor to see the output. Just place an obstacle in front of the sensor to get a good output. You can also modify this code and run the device as per your wish.

#3. Interfacing Gas sensors MQ2 & MQ135 with Arduino :-

About the sensor :

MQ2 : The **MQ2 Gas sensor** is used to mostly detect **LPG, Smoke, Alcohol, Propane, Hydrogen, Methane** and **Carbon Monoxide**. This sensor gives us the value of the amount of these gases.

MQ135 : The **MQ135 Sensors** are used as an air quality sensor for detecting a wide range of gases, including **NH3, NOx, alcohol, benzene, smoke and CO2**. This sensor gives us the environmental Air quality.



Connection :

<i>Sensor</i>	<i>Arduino</i>
Vcc	3.3 v or 5 v
Gnd	Gnd
A0	A0

Code :

Note : You can use this same code for both the sensors.

```
void setup()
{
  pinMode(A0, INPUT);
  Serial.begin(9600);
}

void loop()
{
  int analogSensor = analogRead(A0);
  Serial.print("Gas Amount : ");
  Serial.println(analogSensor);
}
```

Explanation :

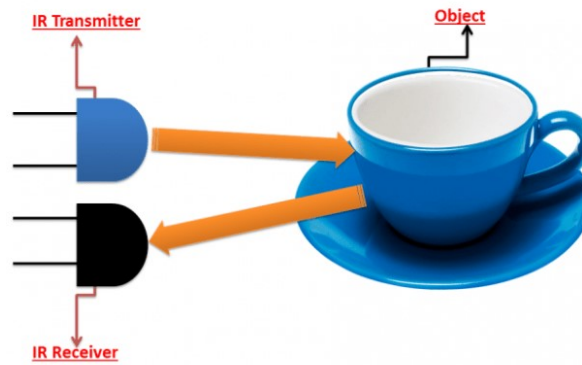
Once the code is uploaded, open your Serial Monitor to see the output. Just show some smoke(forMQ2) in front of the sensor to get a good output. You can also modify this code and run the device as per your wish. And for MQ135 the sensor will automatically detect the environmental Quality.

#4. Interfacing IR Sensor with Arduino :-

About the Sensor : IR Sensor module is used to detect infrared radiations that are not visible to the human eye. The working of this sensor is as similar as ultrasonic sensor. This sensor is mostly used to detect obstacles.



IR Sensor Module



Operation of IR Sensor

Connection :

<i>Sensor</i>	<i>Arduino</i>
Vcc	3.3 v or 5 v
Gnd	Gnd
Out	7

Code :

```

void setup()
{
  // Pin 13 is the builtin LED in Arduino boards:
  pinMode(13, OUTPUT);
  //Pin 7 is connected to the output of IR sensor
  pinMode(7, INPUT);
}

void loop() {
  if(digitalRead(7)==HIGH)
  {
    digitalWrite(13, HIGH);
  }
}

```

```

}
else
{
digitalWrite(13, LOW);
}
}

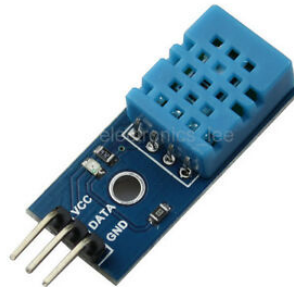
```

Explanation :

Once the code is uploaded, just place an object in front of the sensor and observe the change in LED. The LED will glow once if there is a obstacle and will become off when there is no obstacles. You can also modify this code and run the device as per your wish.

#5. Interfacing DHT11 Sensor with Arduino :-

About the sensor : The DHT11 sensor senses and measures both moisture(Humidity) and temperature in the environment. This sensor is, mostly used to detect the weather.

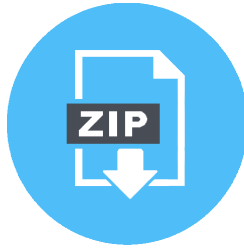


Connection :

<i>Sensor</i>	<i>Arduino</i>
Vcc	5 v
Gnd	Gnd
Out	A0

Pre-required : Before uploading the code you need to include the DHT library.

Just download the below library and open Arduino IDE. Now go to **Sketch > Include Library > Add .Zip Library** and select the downloaded zip file.



<https://www.arduinolibraries.info/libraries/dht-sensor-library>

Code :

```
#include <dht.h>
#define dht_pin A0

dht DHT;

void setup()
{
  Serial.begin(9600);
  delay(500);
  Serial.println("DHT11 Humidity & temperature Sensor\n\n");
  delay(1000);
}

void loop()
{
  DHT.read11(dht_pin);

  Serial.print("Humidity = ");
  Serial.print(DHT.humidity);
  Serial.print("%");
  Serial.print("Temperature = ");
  Serial.print(DHT.temperature);
  Serial.println(" C");

  delay(5000); //Reduce Time for Quick Reply
}
```

Explanation :

Once the code is uploaded, open your Serial Monitor to see the output. Both the Temperature and Humidity in your surrounding will be displayed in your serial monitor.

Thank You