User Manual

for

DIY GP2Y1010AU0F SHARP Dust Sensor
Compatible with Arduino(SE035)

Description:

Sharp's GP2Y1010AU0F is an optical air quality sensor, designed to sense dust particles. An infrared emitting diode and a phototransistor are diagonally arranged into this device, to allow it to detect the reflected light of dust in air. It is especially effective in detecting very fine particles like cigarette smoke, and is commonly used in air purifier systems.

The sensor has a very low current consumption (20mA max, 11mA typical), and can be powered with up to 7VDC. The output of the sensor is an analog voltage proportional to the measured dust density, with a sensitivity of 0.5V/0.1mg/m3.
To interface with the sensor you need to connect to its 6-pin, 1.5mm pitch connector.

Specification

Compact, thin package (46.0 × 30.0 × 17.6 mm)
Low consumption current (Icc: MAX. 20 mA)
The presence of dust can be detected by the photometry of only one pulse
Enable to distinguish smoke from house dust
Lead-free and RoHS directive compliant

Include:

- 1 x Dust Sensor
- 6 x Dupont Line
- 1 x Resistor
- 1× Capacitor

Pinout

| Pin order	Pin Name	Pin description
1	V-LED	IRED Power positive input
2	LED-GND	IRED Power negative input
3	LED	IRED switch control pin
4	S-GND	Power Ground
5	Vo	Analog voltage output
6	Vcc	Power postive

Tutorial

In this exercise with the use of our Arduino Yún, we learn to build our detector air quality. To do this we will use the capabilities of the GP2Y1010AU0F. It's a dust sensor by optical sensing system with an infrared emitting diode (IRED) and a phototransistor that are diagonally arranged into this device. It detects the reflected light of dust in air. Especially, it is effective to detect very fine particle like the cigarette smoke. The output of the sensor is an analog voltage proportional to the measured dust density, with a sensitivity of 0.5V/0.1mg/m3.

What do we need

an Arduino Yún board
a Sharp Optical Dust Sensor (GP2Y1010AU0F)
a breadboard
a 220 uF capacitor
a 150 Ohm resistor
a bunch of wires

The circuit
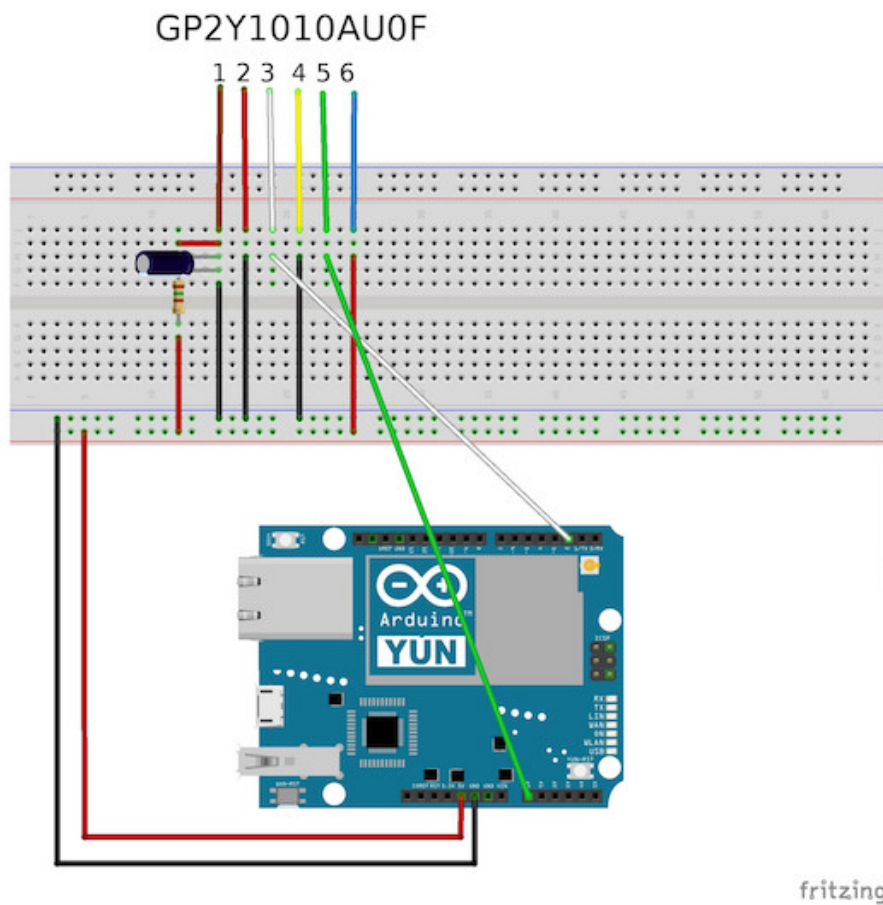
fritzing

Be sure to follow the connections shown in the fritzing circuit   and in the next table :

Sharp pin 1 (V-LED)   => 5V (connected to 150ohm resistor,220 uF capacitor)
Sharp pin 2 (LED-GND)   => Arduino GND pin
Sharp pin 3 (LED)   => Arduino pin 2
Sharp pin 4 (S-GND)   => Arduino GND pin
Sharp pin 5 (Vo)   => Arduino A0 pin
Sharp pin 6 (Vcc)   => 5V

*****Code begin*****

```
/* Detector air quality with Arduino Yun and        **

** Optical Dust Sensor (GP2Y1010AU0F)              */



int dustPin = 0; // dust sensor - Arduino A0 pin

int ledP = 2;
```

```
float voMeasured = 0;

float calcVoltage = 0;

float dustDensity = 0;


void setup(){

  Serial1.begin(230400);

  pinMode(ledP,OUTPUT);

}


void loop(){

  digitalWrite(ledP,LOW); // power on the LED

  delayMicroseconds(280);


  voMeasured = analogRead(dustPin); // read the dust value


  delayMicroseconds(40);

  digitalWrite(ledP,HIGH); // turn the LED off

  delayMicroseconds(9680);


  // 0 - 5V mapped to 0 - 1023 integer values

  // recover voltage

  calcVoltage = voMeasured * (5.0 / 1024.0);

  dustDensity = 0.17 * calcVoltage - 0.1;


  Serial1.print("Raw Signal Value(0-1023) : ");

  Serial1.print(voMeasured);


  Serial1.print(" - Voltage: ");
```

```
  Serial1.print(calcVoltage);


  Serial1.print(" - Dust Density: ");

  Serial1.println(dustDensity); // mg/m3


  delay(1000);

}
```

*****Code End*****

Reference:

https://www.sparkfun.com/products/9689

https://www.sparkfun.com/datasheets/Sensors/gp2y1010au_e.pdf