Color Sensor (Digital with Color Filters)

This is high accuracy digital I2C color sensor module. It is based on the TCS3414CS sensor. The sensor working theory is based on color filters and photodiodes. TCS3414CS includes 16 photodiodes and 12 color filter : 4 green filters (passes only green color), 4 red filters and 4 blue filters. By separating the colors through filters, detecting them using photodiodes the sensor can tell the color of the object.

A good color sensor simulate human eyes and this sensor does this. A typical human eye will respond to wavelengths from about 390 nm (violet) to 700 nm (red). Usually, human eye are good sensor for detecting difference between colors, but they are unable to discriminate between colors when the diffrences are so small, the color sensor can describe thousands of colors very accurately. The output will be in terms of International Commission on Illumination tristimulus values X, Y, Z (RGB model).

The color sensor have many applications such as RGB LED Backlight control, industrial process control, home lighting automation or use in medical diagnostic equipment

Features

Power Supply: 3-6V;

16-Bit digital output with I 2C interface

Operating temperature range -40°C to 85°C

Programmable interrupt function with User-Defined Upper and lower threshold settings

Color Sensor Arduino Tutorial

Connection with Arduino:

Color Sensor   Arduino

SCL >>>>>>>>>analog pin (5)

SDA >>>>>>>>>> to analog pin (4)

VCC >>>>>>>>>> to 5V

GND >>>>>>>>>> to GND

Example Arduino code:

```
#include <Wire.h>

//#include <math.h>

#include <GroveColorSensor.h>

void setup()

{

        Serial.begin(9600);

        Wire.begin();

}
```

```
void loop()

{

        int red, green, blue;

        GroveColorSensor colorSensor;

        colorSensor.ledStatus = 1;                                    // When turn on the
color sensor LED, ledStatus = 1; When turn off the color sensor LED, ledStatus = 0.

        while(1)

        {

                colorSensor.readRGB(&red, &green, &blue);        //Read RGB values to variables.

                delay(300);

                Serial.print("The RGB value are: RGB( ");

                Serial.print(red,DEC);

                Serial.print(", ");

                Serial.print(green,DEC);

                Serial.print(", ");

                Serial.print(blue,DEC);

            Serial.print(" )");

                colorSensor.clearInterrupt();

        }

}
```