Light Sensor Module Data & Tutorial

Introduction

This light sensor module uses the GL5528 photo-resistor to detect the light intensity of the environment. The resistance of the sensor decreases when the light intensity of the environment increases. The LM358 op-amp is configured as a "voltage follower" to increase the accuracy of this device.

Application Examples

1. You can make a light turn on when it is getting dark.
2. With a laser pointer you can make a cheap intruder alarm.
3. Control the intensity of light source based on the surrounding light conditions
4. Tracking of solar panels to the sun direction for best solar power generation efficiency
Electronic Characteristics

<table>
<thead>
<tr>
<th>Items</th>
<th>Conditions</th>
<th>Min</th>
<th>Type</th>
<th>Max</th>
<th>Unit</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>System Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VCC</td>
<td>-</td>
<td>3</td>
<td>5</td>
<td>30</td>
<td>V</td>
</tr>
<tr>
<td>Supply Current</td>
<td>-</td>
<td>0.5</td>
<td>-</td>
<td>3</td>
<td>mA</td>
</tr>
<tr>
<td><strong>Photo-resistor characteristic</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Light resistance</td>
<td>10 LUX</td>
<td>8</td>
<td>-</td>
<td>20</td>
<td>K Ohm</td>
</tr>
<tr>
<td>Dark resistance</td>
<td>0 LUX</td>
<td>-</td>
<td>1</td>
<td>-</td>
<td>K Ohm</td>
</tr>
<tr>
<td>Response Time</td>
<td>Rising</td>
<td>-</td>
<td>20</td>
<td>-</td>
<td>ms</td>
</tr>
<tr>
<td>Peak wavelength</td>
<td>-</td>
<td>-</td>
<td>540</td>
<td>-</td>
<td>nm</td>
</tr>
<tr>
<td>Temperature</td>
<td>-</td>
<td>-30</td>
<td>-</td>
<td>+70</td>
<td>Centigrade</td>
</tr>
</tbody>
</table>
What is best light source suited for our light sensor?

As you can see in the above table, the Peak wavelength is 540 nm, which makes the green light (Green LED) - for which the emitted light wavelength is about 570 - is best suited for light detection using this sensor. Yet, this light sensor module is suitable for detecting day light, lamp light, LASER pointer light.
Hardware Installation

Connect the Light sensor module to the Arduino analog pin using 3 wire cable

Arduino Software Programming

The program below uses the Light sensor to control the LED. As the picture shows above, the Light sensor is connected to analog port 0 and the LED is connected to port 12. The resistance of the photoresistor can be calculated based on the voltage obtained through the analog pin. Then you can use this data to control the LED or other thing.

/*
This sketch is for use with the LDR Twig, Stem Base Shield and a LED Twig
Grove series are made by Seeedstudio.com
Sketch was improved and patched by DutchDude
*/

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#include <math.h>

const int ledPin=12; //Connect the LED
Grove module to Pin12, Digital 12
const int thresholdvalue=10; //The threshold for which the LED should turn on. Setting it lower will make it go on at more light, higher for more darkness

void setup() {
    Serial.begin(9600); //Start the Serial connection
    pinMode(ledPin,OUTPUT); //Set the LED on Digital 12 as an OUTPUT
}

void loop() {
    int sensorValue = analogRead(0);
    float Rsensor;
    Rsensor=(float)(1023-sensorValue)*10/sensorValue;

    if(Rsensor>thresholdvalue)
    {
        digitalWrite(ledPin,HIGH);
    }
    else
    {
        digitalWrite(ledPin,LOW);
    }

    Serial.println(Rsensor,DEC); 
} 

For more Information, Please contact Future Electronics Egypt (Arduino Egypt)