



Grove - Light Sensor(P) User Manual

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Wiki: http://www.seeedstudio.com/wiki/Grove_-_Light_Sensor

Bazaar: http://www.seeedstudio.com/depot/Grove-Light-SensorP-p-1253.html?cPath=25_27

Document Revision History

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Under the supervision of Seeed Technology Inc., this manual has been compiled and published which covered the latest product description and specification. The content of this manual is subject to change without notice.

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1. Introduction

The Grove - Light Sensor module incorporates a Light Dependent Resistor (LDR). Typically, the resistance of the LDR or Photoresistor will decrease when the ambient light intensity increases. This means that the output signal from this module will be HIGH in bright light, and LOW in the dark.

2. Features

- Easy to use light sensor module
- Resistance decreases as luminance increases
 - ◆ Low resistance (in bright light) triggers a HIGH signal towards the output module
 - ◆ High resistance (in darkness) triggers a LOW signal towards the output module
- Easily integrates with Logic modules on the input side of Grove circuits
- Uses Standard 4-pin [Grove Cables](#) to connect to other Grove modules such as [Grove Power Modules](#), [Logic Gates](#) and [Grove - Base Shield](#)

3. Specifications

- Voltage: 3-5V
- Supply Current: 0.5-3mA
- Light resistance: 20K Ω
- Dark resistance: 1M Ω
- Response time: 20-30 secs
- Peak Wavelength: 540 nm
- Ambient temperature: -30~70°C
- LDR Used: [GL5528](#)

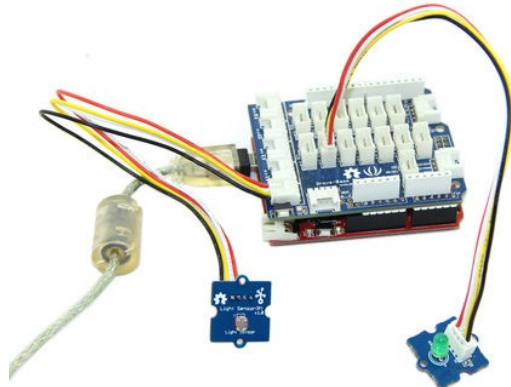
4. Usage

4.1 With Arduino

Follow these simple steps to build a Grove circuit using the light sensor:

4.1.1 Hardware connection

When using the module in conjunction with an [Arduino](#) or a [Seeeduino](#), use the [Grove - Base Shield](#) and connect the Grove - Light Sensor module to the shield using a designated Grove Interface. Also attach an output module such as a [Grove - Red LED](#) which will get triggered based on input received from the light sensor (shown below).



4.1.2 Software Upload

Upload the following sample sketch to make the LED turn ON and OFF based on input from the light sensor:

```
/*
/* Grove - Light Sensor demo v1.0
*
* signal wire to A0.
* By: http://www.seeedstudio.com
*/
#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.
float Rsensor; //Resistance of sensor in K
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);
  Rsensor=(float) (1023-sensorValue)*10/sensorValue;
  if (Rsensor>thresholdvalue)
  {
    digitalWrite(ledPin, HIGH);
  }
  else
  {
    digitalWrite(ledPin, LOW);
  }
  Serial.println("the analog read data is ");
  Serial.println(sensorValue);
  Serial.println("the sensor resistance is ");
  Serial.println(Rsensor,DEC);//show the light intensity on the serial monitor;
  delay(1000);
}

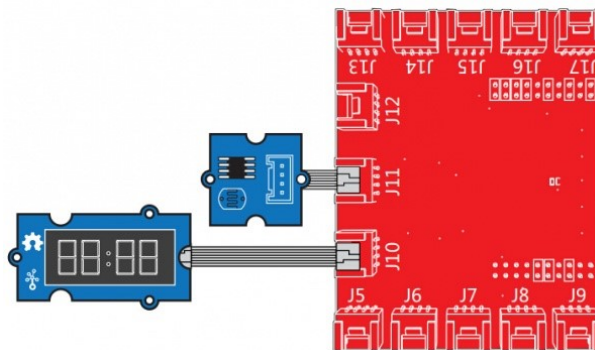
```

For further information on the illuminance-resistance characteristics of the LDR used by this Grove module, refer to the [GL5528 datasheet](#).

4.2 With TI LaunchPad

Sensing the Light (Light Sensor)

This example reads the amount of light incident on the Grove-light-sensor and displays the reading on the Grove 4-digital display. This is similar to the previous example except we are now using the ambient light sensor instead of the potentiometer rotary angle knob.



```

/*
Light Sensor
A simple program that display the value of light incident on the grove-light-sensor
by grove-4-digital-display, this example is definitely similar to grove-rotary-angle-sensor

```

The circuit:

- * grove-4-digital-display attached to dio9&dio10 (IIC plug on Grove Base BoosterPack)
- * sig pin of the light sensor to the analog pin
- * one side pin (either one) to ground
- * the other side pin to VCC

* Note:

Created by Oliver Wang

This example code is in the public domain.

http://www.seeedstudio.com/depot/Grove-Light-Sensor-p-746.html?cPath=25_27

*/

```
#include "TM1637.h"

/* Macro Define */
#define CLK          39          /* 4-digital display clock pin */
#define DIO          38          /* 4-digital display data pin */
#define LIGHT_SENSOR 24          /* pin of grove light sensor */

/* Global Variables */
TM1637 tm1637(CLK, DIO);        /* 4-digital display object */
int analog_value = 0;          /* variable to store the value coming from rotary angle
sensor */
int8_t bits[4] = {0};          /* array to store the single bits of the value */

/* the setup() method runs once, when the sketch starts */
void setup() {

  /* Initialize 4-digital display */
  tm1637.init();
  tm1637.set(BRIGHT_TYPICAL);
}

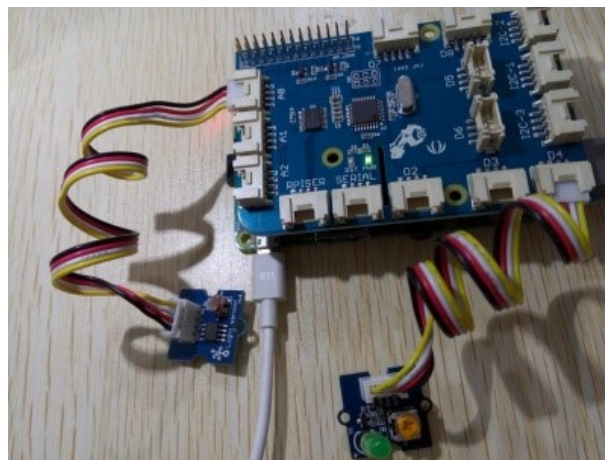
/* the loop() method runs over and over again */
void loop() {

  analog_value = analogRead(LIGHT_SENSOR);    /* read the value from the sensor */
  memset(bits, 0, 4);                          /* reset array when we use it */
  for(int i = 3; i >= 0; i--) {
    /* get single bits of the analog value */
```

```
bits[i] = analog_value % 10;
analog_value = analog_value / 10;
tm1637.display(i, bits[i]);          /* display by 4-digital display */
}
}
```

4.3 With Raspberry Pi

First step, you should connect to Raspberry Pi+ with Grove - Light Sensor and Grove - Green LED. Such as the following picture. Then run the program on your Raspberry Pi, and it will print brightness information on the terminal. When brightness is less than a certain value, the LED will turn on.



```
# GrovePi+ & Grove Light Sensor & LED

import time
import grovepi

# Connect the Grove Light Sensor to analog port A0
# SIG, NC, VCC, GND
light_sensor = 0

# Connect the LED to digital port D4
# SIG, NC, VCC, GND
led = 4

# Turn on LED once sensor exceeds threshold resistance
threshold = 10

grovepi.pinMode(light_sensor, "INPUT")
grovepi.pinMode(led, "OUTPUT")
```

```
while True:
    try:
        # Get sensor value
        sensor_value = grovepi.analogRead(light_sensor)

        # Calculate resistance of sensor in K
        resistance = (float)(1023 - sensor_value) * 10 / sensor_value

        if resistance > threshold:
            # Send HIGH to switch on LED
            grovepi.digitalWrite(led,1)
        else:
            # Send LOW to switch off LED
            grovepi.digitalWrite(led,0)

        print "sensor_value =", sensor_value, " resistance =", resistance
        time.sleep(.5)

    except IOError:
        print "Error"
```

Run the program

- Find the path to the file(According to your own path)

```
cd GrovePi/Software/Python/
```

- Run Program

```
sudo python grove_light_sensor.py
```

5. Availability

This [Grove](#) module is available as part of the following [Grove Kit Series](#):

- [Grove Mixer Pack V2](#)
- [Grove - Mixer Pack](#)

Alternatively, it can be bought stand-alone [here](#) at the [Seeed Studio Bazaar](#).

Note that there is another variant of this module available - the [Grove - Light Sensor \(Panel Mount\)](#). This module is identical to the **Grove - Light Sensor** except that the Grove connector is moved to the back of the PCB. This way, the on-board LDR is not obstructed by any wires and can be placed neatly for optimal use.

6. Resources

- [Grove - Light Sensor Eagle Files](#)
- [GL5528 Reference Information](#)
- [LM358 Datasheet](#)
- [Light Sensor Library](#)
- [github repository for Light Sensor](#)

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