Introduction

Xadow UV Sensor is suitable for measuring the UV radiation in sunlight. It can detect the UV wavelength of 290 ~ 400 nm. The UV Sensor is outputting digital voltage value corresponding to UV light intensity. With the diagram of output voltage and UV, we can easy to know the current UV index. The Xadow UV Sensor can be powered by 3.3V. And it is compatible with Xadow system.

Specification

Can detect UV-A and UV-B Brand
UV wavelength detect: 290 ~ 400nm
Maximum-sensitivity wave length: 330nm
Built-in ADC circuit, high convert accuracy
Test Accuracy: ±0.1 UV Index
Operating temperature: -25 ~ 70 ℃
Dimensions: 25.43mm x 20.35mm

Demonstration

Xadow UV Sensor can output a voltage value corresponding to UV index. Because there is a linear relationship between the output voltage and UV index, you can also directly see UV index with a formula. Next we show how to use UV sensor to know the UV index and display it on the OLED screen.
Required Xadow module: Xadow Main Board、Xadow OLED 12864、Xadow UV Sensor

Hardware Installation

图片

Note: when connect Xadow UV Sensor to Xadow Main Board, you should concern about the connection direction. The connection method is that the unfilled corner of one xadow module need to connect to the right angle of another module(see four corners of each xadow module).

Download Code

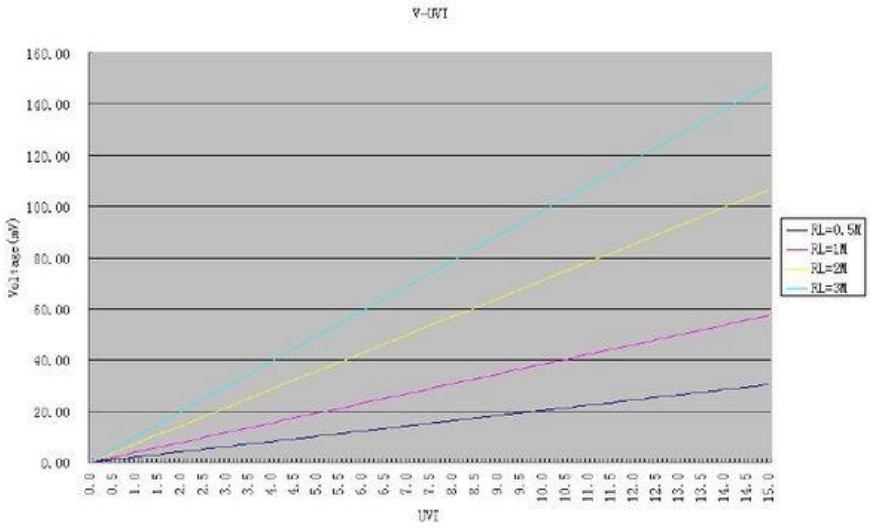
- Firstly, you should make sure there are the library:OLED_Display12864 in your Arduino Library. If not, please click here to download and add it to Arduino Library. Refer to How to install Arduino Library in wiki page, you will familiar with the operation.
- Now you can upload it to Xadow Main Board by copying and pasting them into Arduino IDE.

```
#include <Wire.h>
#include <SeeedOLED.h>
#include <Streaming.h>

#define ADDR_ADC121      0x5A

#define V_REF 3.00

#define REG_ADDR_RESULT             0x00
#define REG_ADDR_ALERT              0x01
#define REG_ADDR_CONFIG             0x02
#define REG_ADDR_LIMITL             0x03
#define REG_ADDR_LIMITH             0x04
#define REG_ADDR_HYST               0x05
#define REG_ADDR_CONVL              0x06
#define REG_ADDR_CONVH              0x07

unsigned int getData;
float analogVal=0;
float UVIndex = 0;
void init_adc()
{
   Wire.beginTransmission(ADDR_ADC121);            // transmit to device
   Wire.write(REG_ADDR_CONFIG);                      // Configuration Register
   Wire.write(0x20);
   Wire.endTransmission();
}
void setup()
{
   Wire.begin();
   Serial.begin(38400);
   SeeedOled.init();   //initialze SEEED OLED display
   SeeedOled.clearDisplay();   // clear the screen and set start position to top left corner

   init_adc();
}

void loop()
{
      readVoltage();
      //SeeedOled.clearDisplay();
      SeeedOled.setTextXY(1,0);
      SeeedOled.putString("Voltage: ");
      SeeedOled.setTextXY(1,8);
      SeeedOled.putFloat(analogVal);
      SeeedOled.setTextXY(1,12);
      SeeedOled.putString("mV");
      SeeedOled.setTextXY(2,0);
      SeeedOled.putString("UVIndex: ");
      SeeedOled.setTextXY(2,8);
      SeeedOled.putFloat(UVIndex);
      delay(50);
}
void readVoltage()        //unsigned int *data
{
      Wire.beginTransmission(ADDR_ADC121);            // transmit to device
      Wire.write(REG_ADDR_RESULT);                      // get reuslt
      Wire.endTransmission();

      Wire.requestFrom(ADDR_ADC121, 2);               // request 2byte from device
      delay(1);
      if(Wire.available()<=2)
      {
         getData = (Wire.read()&0x0f)<<8;
         getData |= Wire.read();
```

```
    }
    delay(50);
    analogVal = getData*V_REF/4096/2;
    Serial.print("analogVal:");
    Serial.print(analogVal);
    Serial.println("mV");
    UVIndex = analogVal/9.71;
     Serial.print("UVIndex:");
    Serial.println(UVIndex);

}
```

- Open the serial monitor, the voltage value and UV index are showing:

- You can see on the OLED screen:
- Figuring out the UV index is not a different matter by referring to the below diagram.



About the Xadow UV Sensor, we use a resistance which resistance value is 3M, so you need refer to this line for RL=3M. It is linear observing the relationship between voltage and UV. And the formula by calculated can be gotten: UV Index = Voltage/9.71 which has been used in code.

Reference

UV Sensor I2C Address

The Xadow UV Sensor has a seven-bit hardware address which is referred to as a slave address. And the slave address is configured by the ADR0 and ADR1 address selection inputs. ADR0 and ADR1 can be low level, left floating, or tied to high level.The state of these inputs sets the hardware address that the module responds to on the I2C bus (see the below Table).

Slave Address[A6 - A0]	ADR0 and ADR1 inputs state	
	ADR1	ADR0
1010000(0x50)	Floating	Floating
1010001(0x51)	Floating	L
1010010(0x52)	Floating	H
1010100(0x54)	L	Floating
1010101(0x55)	L	L
1010110(0x56)	L	H
1011000(0x58)	H	Floating
1011001(0x59)	H	L
1011010(default 0x5A)	H	H

In default mode, ADR0 and ADR1 are connected to "H"(see the Xadow UV Sensor)

spectral response curve of UV Sensor