UV Sensor (C)

V Sensor (C) is an I2C digital UV sensor expansion board equipped with LTR390-UV-01, which can be used to measure UV and human visible light, and can output light intensity data. UV Sensor (C) has the characteristics of sensitive sensing, fast response and small size. Its core sensor LTR390-UV-01 is integrated on a 27 × 20mm expansion board, which can be easily integrated into the device.

Product Features

- Using LTR390-UV-01, can measure ultraviolet and visible light of human eye
- Built-in ADC, can directly output light intensity through I2C interface, not easy to be disturbed by noise
- With interrupt output and programmable upper and lower thresholds
- On-board level conversion circuit, compatible with 3.3V/5V working level
- Provide complete supporting information manual (Raspberry/Arduino/STM32 sample program and user manual, etc.)

Specifications

- Operating voltage: 3.3V/5V
- Sensor: LTR390-UV-01
- Response wavelength : 280 - 430nm
- Communication interface: I2C (fixed address: 0x53)
- Product size: 27 × 20mm
- Fixed aperture: 2.0mm

Applications

- Ultraviolet tester
- Outdoor ultraviolet detector
- Germicidal lamp

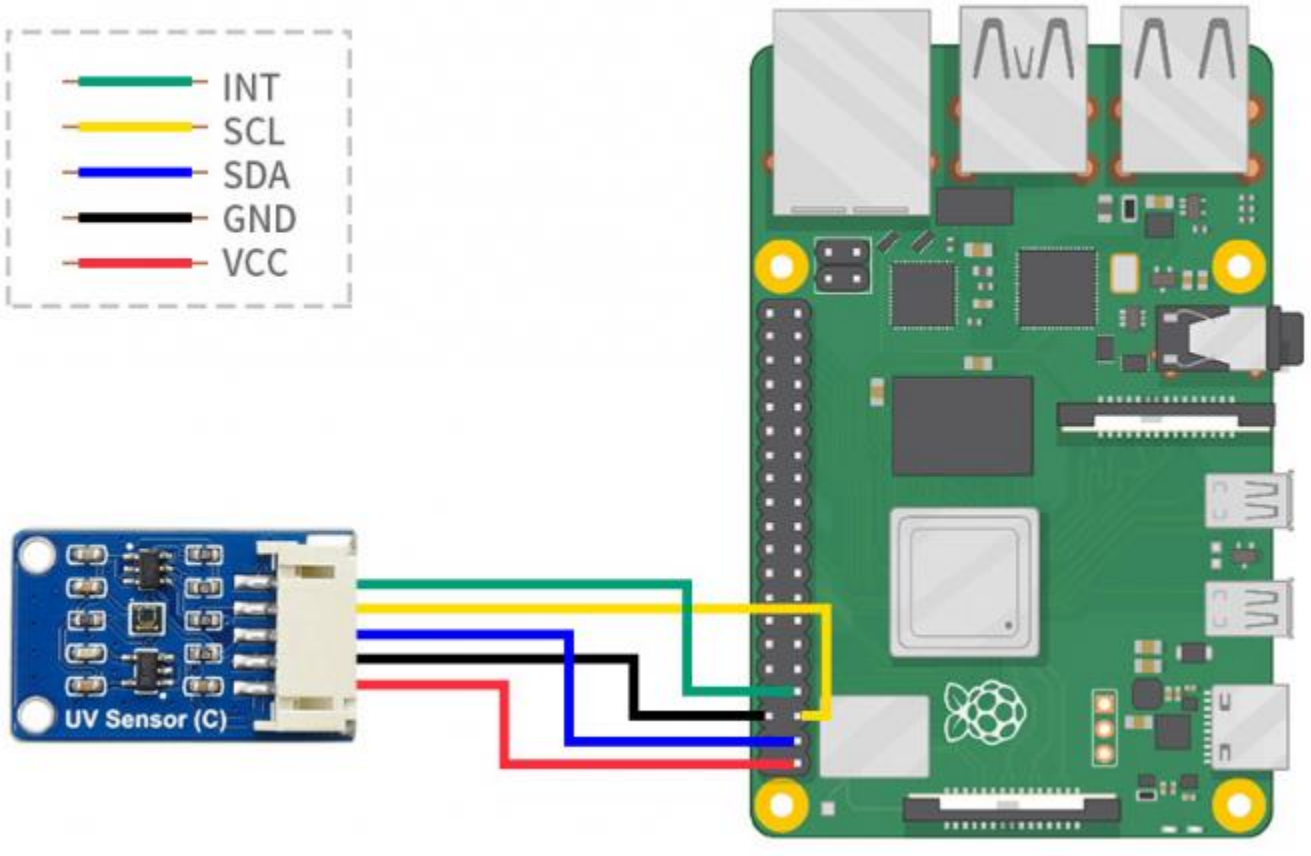
Interface Description

- Pin function

Pin Number	Identification	Pin Description
1	VCC	3.3V/5V power supply positive
2	GND	Power Ground
3	SDA	I2C data line
4	SCL	I2C clock line
4	INT	Interrupt output

This routine uses a Raspberry Pi 4 Model B, which provides RPI (Python) library routines

Hardware connection

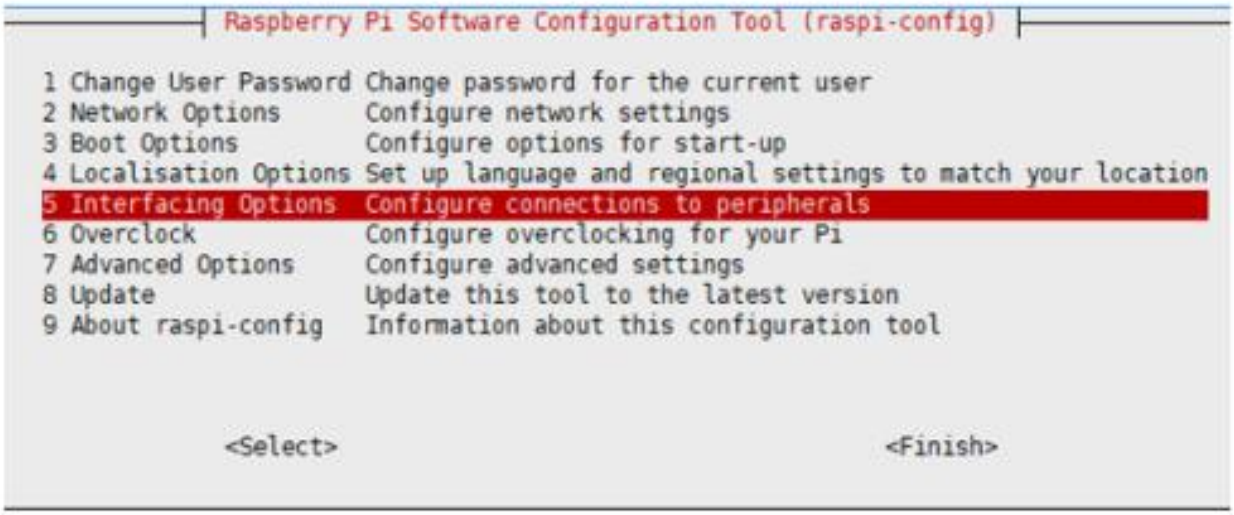


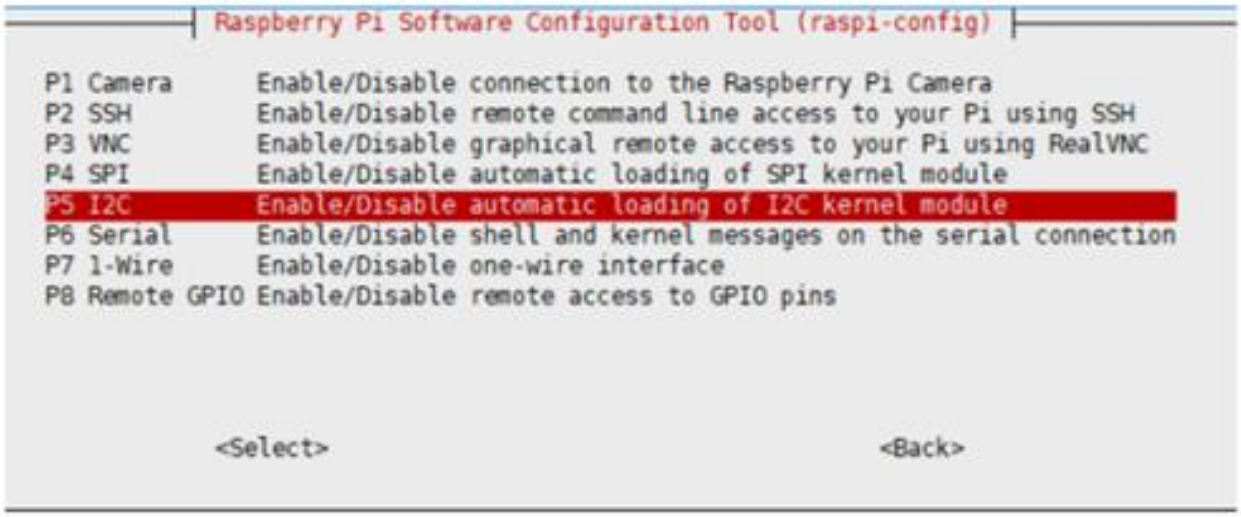
Using Raspberry Pi

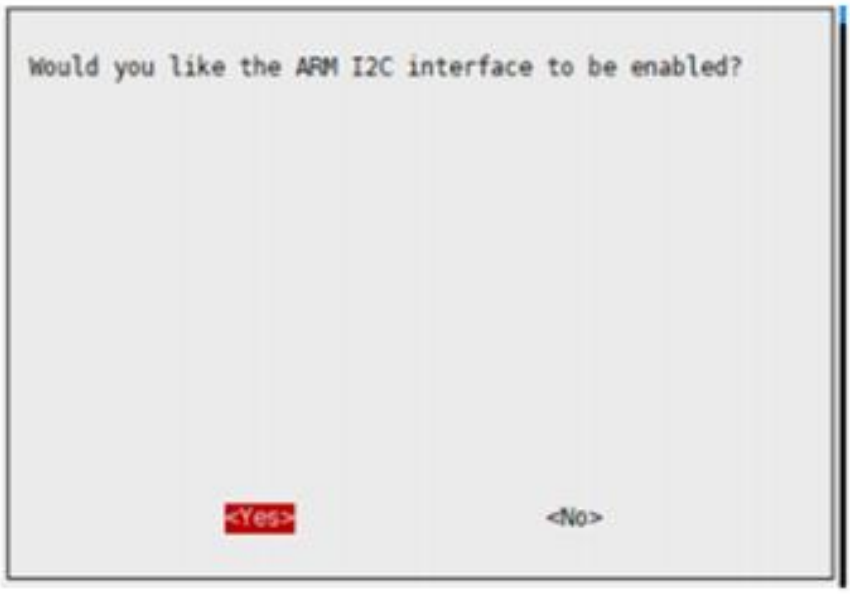
Open I2C interface

- Execute in terminal:

```
sudo raspi-config
#Select Interfacing Options -> I2C ->yes to start the i2C kernel driver
```







- then restart the raspberry pi

```
sudo reboot
```

Installing Libraries

- Install BCM2835, open the Raspberry Pi terminal, and run the following command

```
wget http://www.airspayce.com/mikem/bcm2835/bcm2835-1.60.tar.gz
tar zxvf bcm2835-1.60.tar.gz
cd bcm2835-1.60/
sudo ./configure
sudo make
sudo make check
sudo make install
```

- install wiringpi

```
sudo apt-get install wiringpi
#For Raspberry Pi 4B may need to be upgraded:
cd /tmp
wget https://project-downloads.drogon.net/wiringpi-latest.deb
sudo dpkg -i wiringpi-latest.deb
gpio -v
```

Download and run the test routine

```
wget https://www.waveshare.net/w/upload/a/ab/UV_Sensor_C_Code.zip
unzip -o UV_Sensor_C_Code.zip  -d ./UV_Sensor_C_Code
sudo chmod 777 -R UV_Sensor_C_Code
```

python program

Execute in the UV_Sensor_C_Code directory:

```
cd UV_Sensor_C_Code/RPI
sudo python LTR390.py
```

- Note: The sensor has 2 working modes, measuring light intensity and UV light respectively.
- Note: The upper and lower thresholds of the interrupt are set by the program. If it is higher than or lower, it will trigger, and the INT pin will output a high pulse.

This routine has been verified on NUCLEO-F103RB (chip model STM32RBT6). If you need to transplant, please pay attention to the relevant configuration and connection method

Hardware connection

Connection with XNUCLEO-F103RB:

UV Sensor (C)	XNUCLEO-F103RB
VCC	3.3V/5V
GND	GND
SDA	SDA/D14/PB9
SCL	SCL/D15/PB8

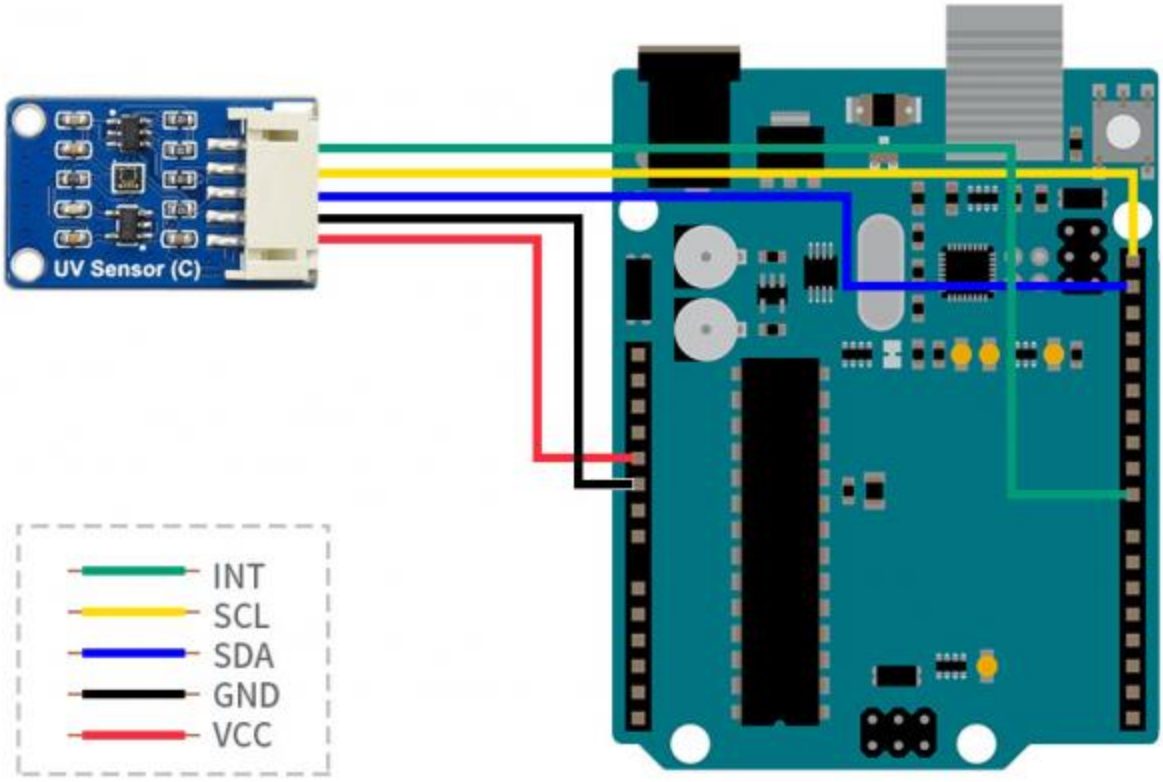
Experimental phenomenon

The default serial port 2 prints data, and using UV lamp or UV pen to illuminate the sensor will print the UV value

```
[13:16:21.206]收←◆UV = 0
[13:16:21.708]收←◆UV = 0
[13:16:22.211]收←◆UV = 0
[13:16:22.714]收←◆UV = 0
[13:16:23.218]收←◆UV = 15
[13:16:23.721]收←◆UV = 17
[13:16:24.223]收←◆UV = 17
[13:16:24.726]收←◆UV = 23
[13:16:25.229]收←◆UV = 13
[13:16:25.733]收←◆UV = 16
[13:16:26.236]收←◆UV = 30
[13:16:26.738]收←◆UV = 0
[13:16:27.241]收←◆UV = 0
[13:16:27.744]收←◆UV = 0
```

This example is tested on Arduino UNO. If other types of Arduino are used, please pay attention to whether the relevant pins are connected correctly

Hardware connection



Install and compile software (windows tutorial)

arduino IDE installation tutorial

Verifiers

Download the program on the product encyclopedia interface, and then unzip it.
This routine is written based on the arduino library version, so the program needs to be copied to the arduino library directory. Copy the folder Waveshare_UV_C in the Arduino directory in the next week's file to the libraries in the Arduino installation directory (C:\Users\XXX\Documents\Arduino\libraries or C:\Program Files (x86)\Arduino\libraries)

Open Arduino IDE: Click File (flie)->Example (example) to load the library, check if there is the Waveshare_UV_C option, if so, the library is imported successfully

Open the ino project file in the example, select the corresponding model of the development board, select the corresponding COM port, compile the program, download it to the UNO, open the serial monitor, and use the UV pen or UV lamp to print the UV value

Resources

- Schematic
- Code
- Datasheets