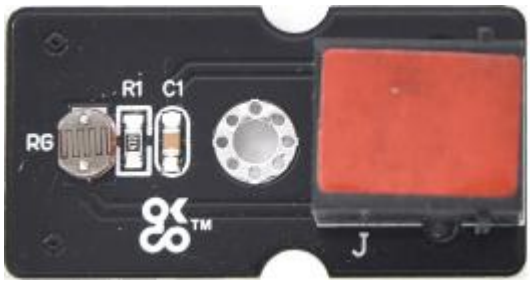
Photoresistor Sensor (000x0000 Article Number) (TS2134)

DESIGN THE WORLD

Product Details

This is the TelePort photoresistor sensor. Its working principle is that photo-sensitive elements convert light signals into electricity signals. The photo-sensitive element varies with the brightness of light. When the light brightness is stronger, the resistance will reduce; on the contrast, when the light is weaker the resistance will rise.



Features and Benefits

- Compatible with RJ11 6P6C OKdo TelePort Control boards and expansion shields.
- Easy to use, high sensitivity, fast response, and wide spectral response makes this the ideal sensor to build a photosensitive, intelligent switch design.

Technical Specifications

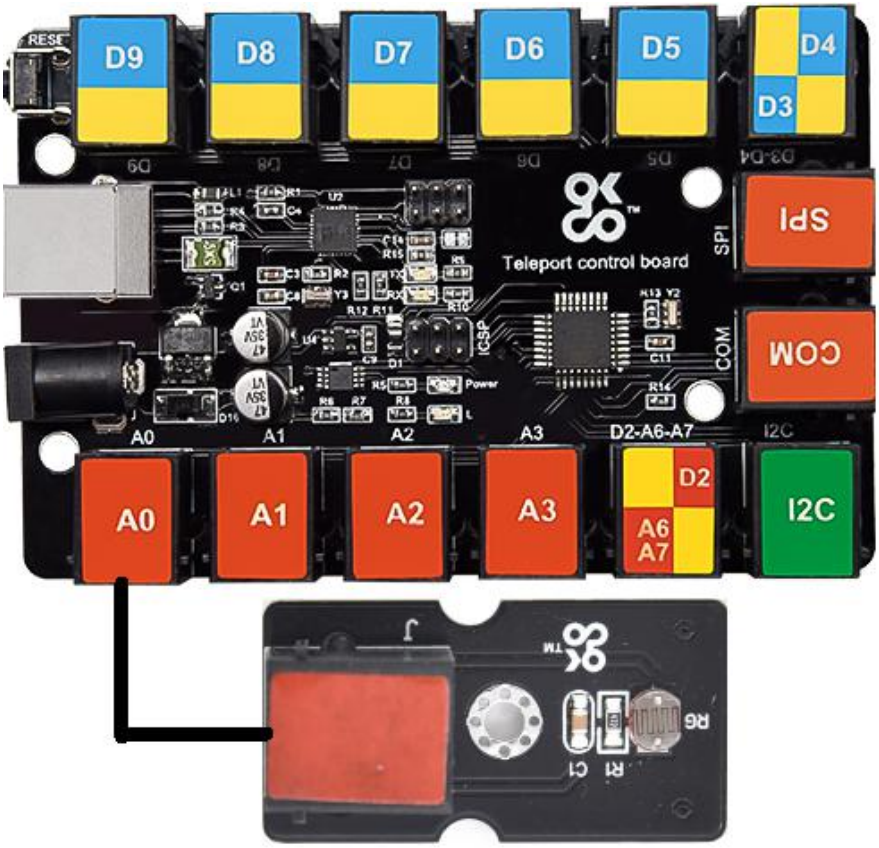
Sensor type	Analog input
Working voltage	3.3V-5V
Dimensions	38mm*20mm*18mm
Weight	4.3g
Sensor type	Analog input

Applications

- Light-controlled lamps
- Light-controlled toys
- Light-controlled switches
- Light-controlled music box
- Solar lawn lights

This module is compatible with the TS2180-Raspberry Pi shield, the TS2179-Micro:bit shield and the TS2178-TelePort main board.

➢ **Arduino Application**



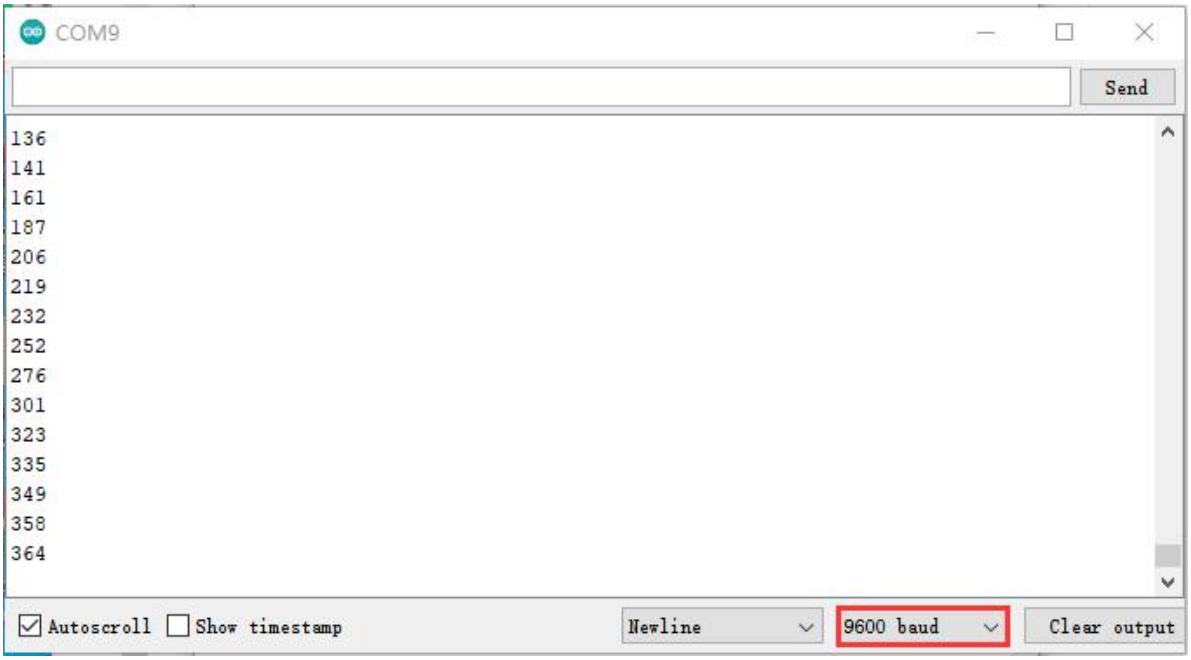
This module is compatible with the TS2178 TelePort control board.

Test Code

```
int sensorPin =A0 ; //define sensor pin A0
int value = 0; //define the initial value of the variable value is 0
void setup()
{
 Serial.begin(9600);
 }
void loop()
{
 value = analogRead(sensorPin); //read the sensor simulation value
Serial.println(value, DEC); //Serial port print analog value
delay(50); //delay 50 ms
}
```

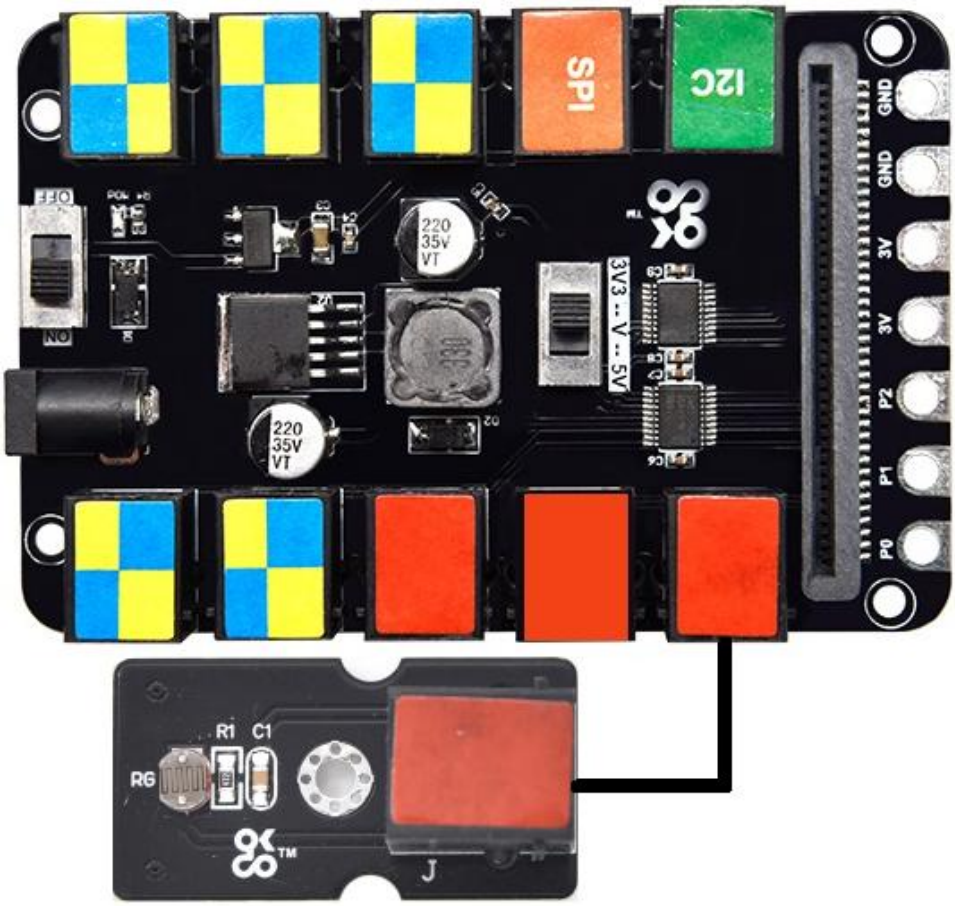
Test Result

Wire up, upload test code, power it up, open serial monitor and set baud rate to 9600. The stronger the light intensity, the larger the analog value; on the contrary, the weaker the light intensity, the smaller the analog value. As shown below;



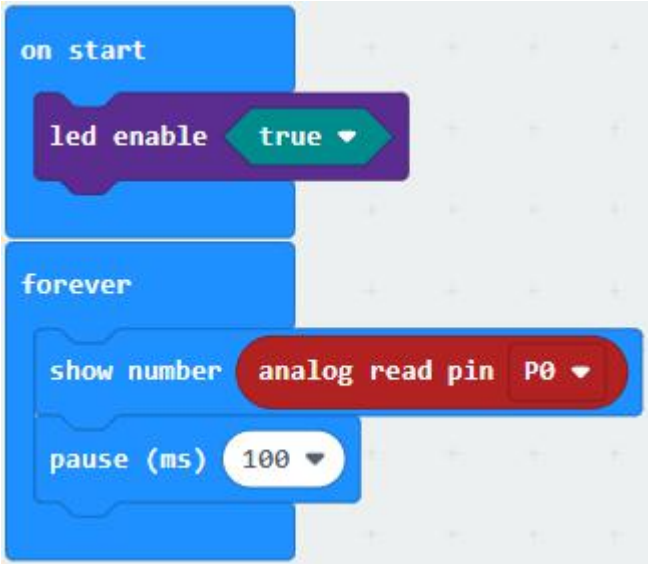
If you want to know more details about Arduino and the TelePort control board, you can refer to TS2178.

- **Micro:bit Application**



It is compatible with the Micro:bit board and the TS2179 Micro:bit expansion board.

Test Code



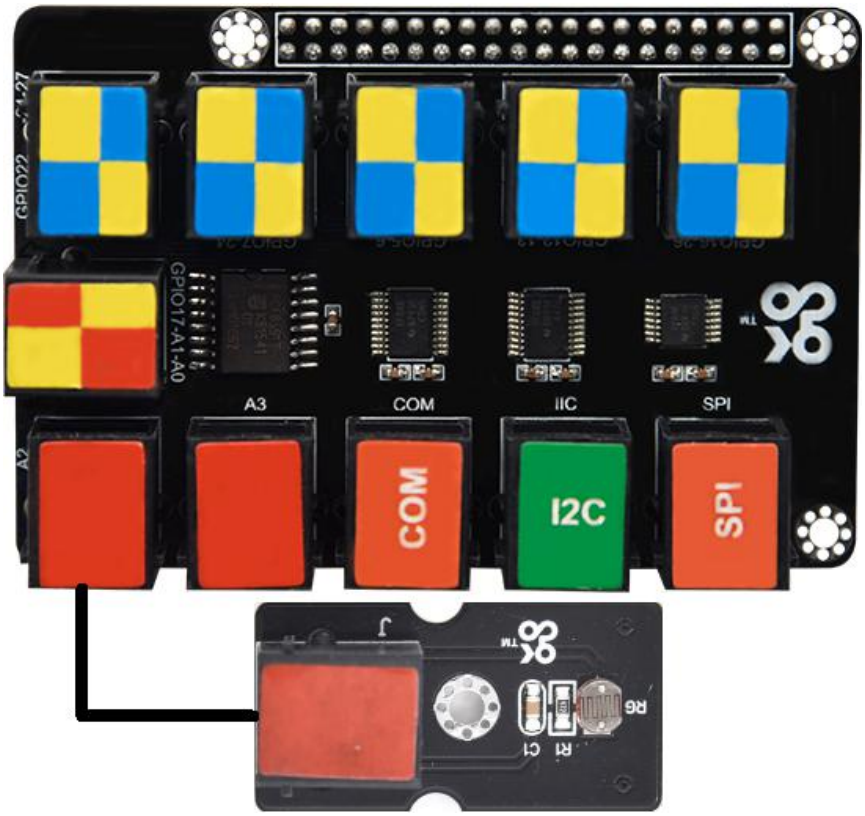
.....①Run the "on start" block to boot the program
.....②Open the LED matrix of the Micro:bit
.....③The program is run circularly under the command of "forever" block
.....④Micro:bit shows the analog values detected by the photoresistor
.....⑤delay in 100ms

Test Result

Wire up, insert the Micro:bit V2.0 into the shield, turn DIP switch to 3V3, upload test code and power it up. Then Micro:bit will show the analog values detected by the photoresistor.

If you want to know more details about the Micro:bit board and Micro:bit shield, you can refer to TS2179.

➢ **Raspberry Pi Application**



This module is compatible with the Raspberry Pi board and the TS2180 Raspberry Pi shield.

PCF8591 A/D Conversion：

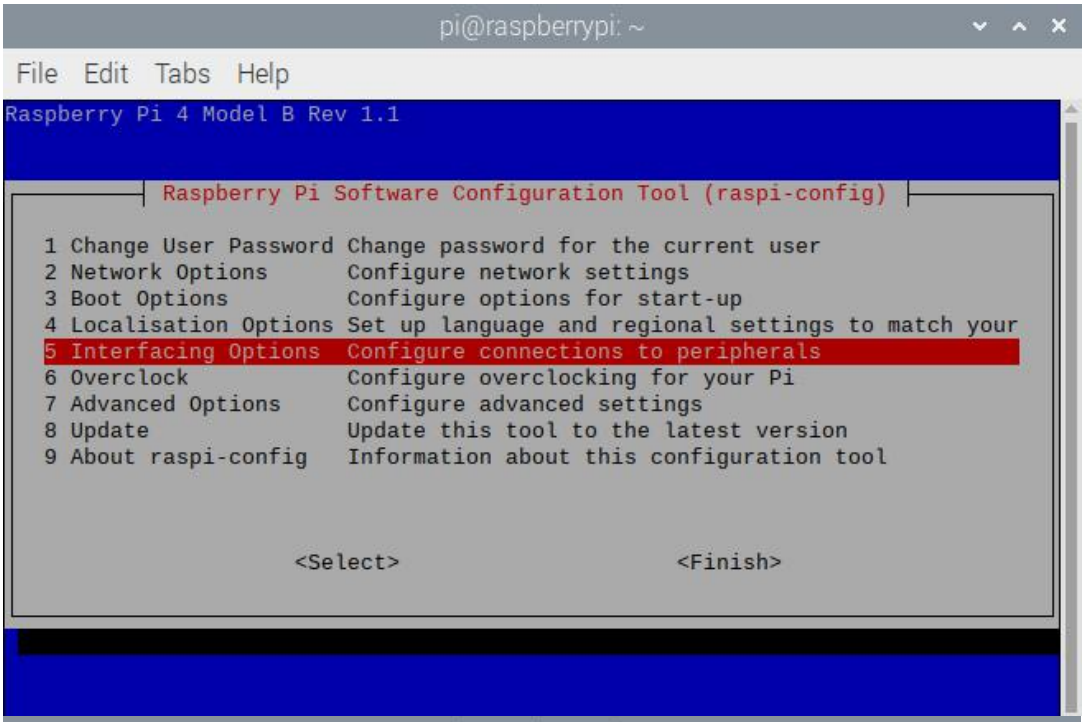
The Raspberry Pi itself does not have AD/DA function; therefore an expansion board with this function is required when connected to external analog sensors. And here we use a PCF8591 A/D converter with I2C communication.

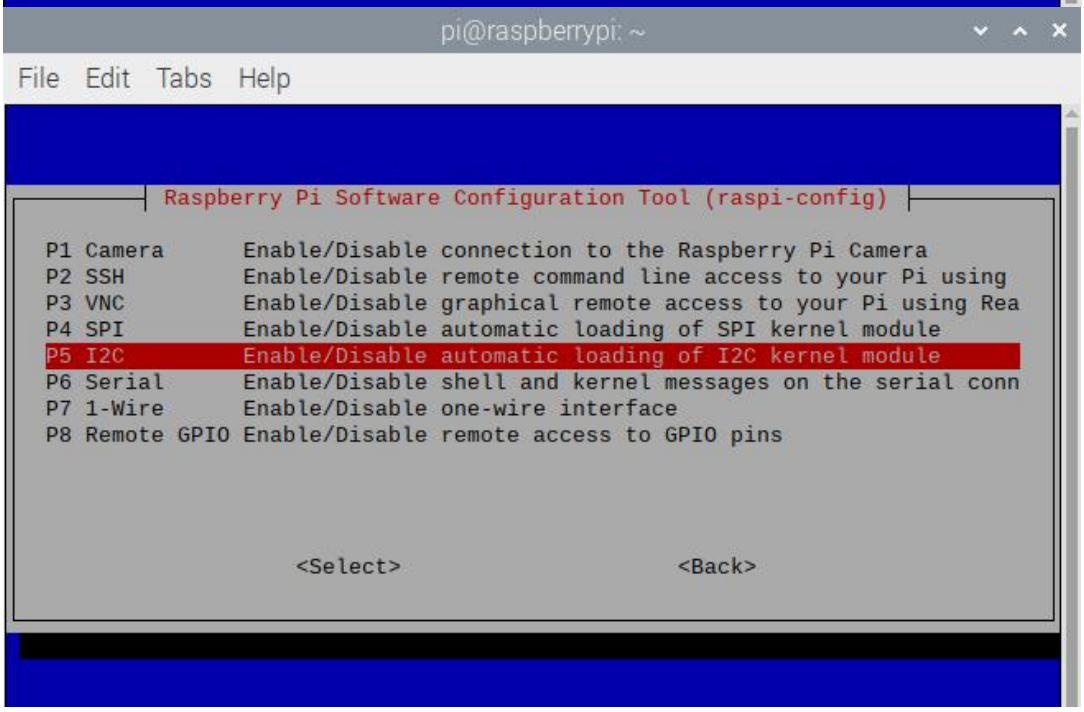
Enable the I2C communication function of the Raspberry Pi as follows:

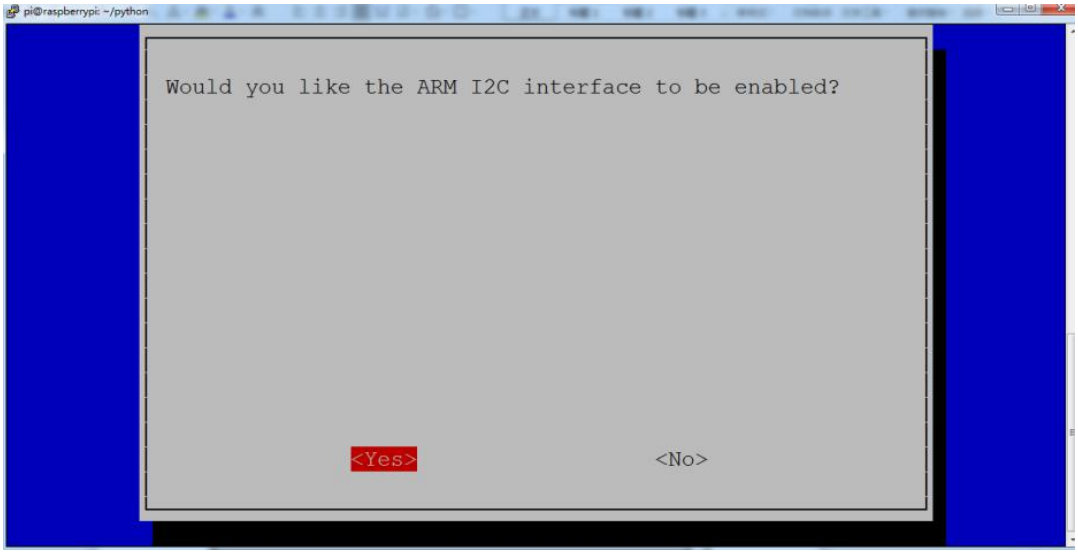
a. Raspberry Pi does not enable the I2C function by default. Enter sudo raspi-config in the terminal to enter the Raspberry Pi configuration interface.

```
pi@raspberrypi:~/python $ sudo raspi-config
```

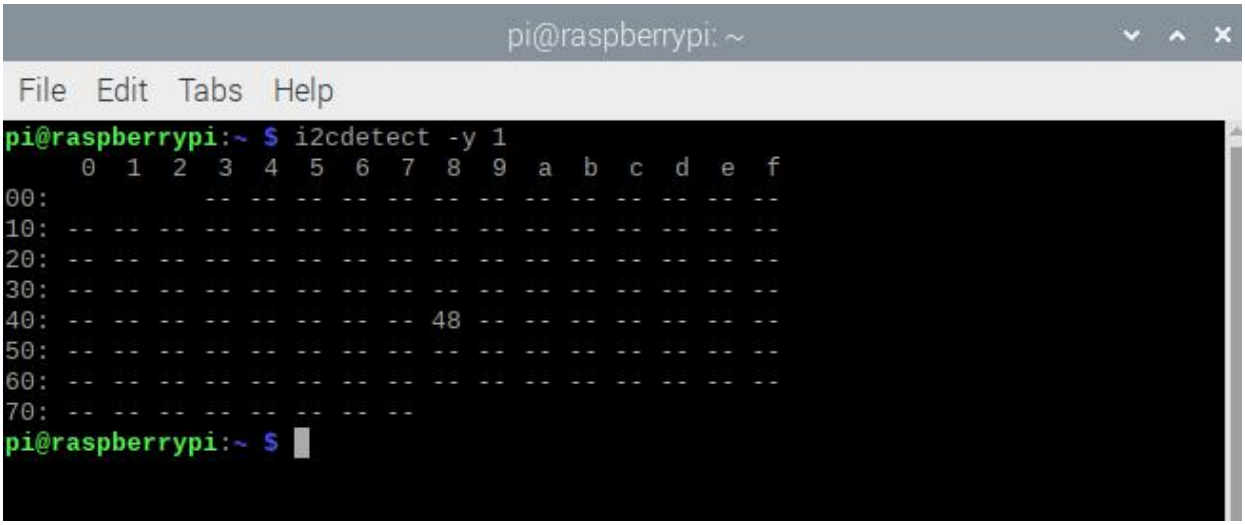
Follow the below instructions to enable the I2C function of Raspberry Pi:(press ←,↑,↓,→ then“Enter”)





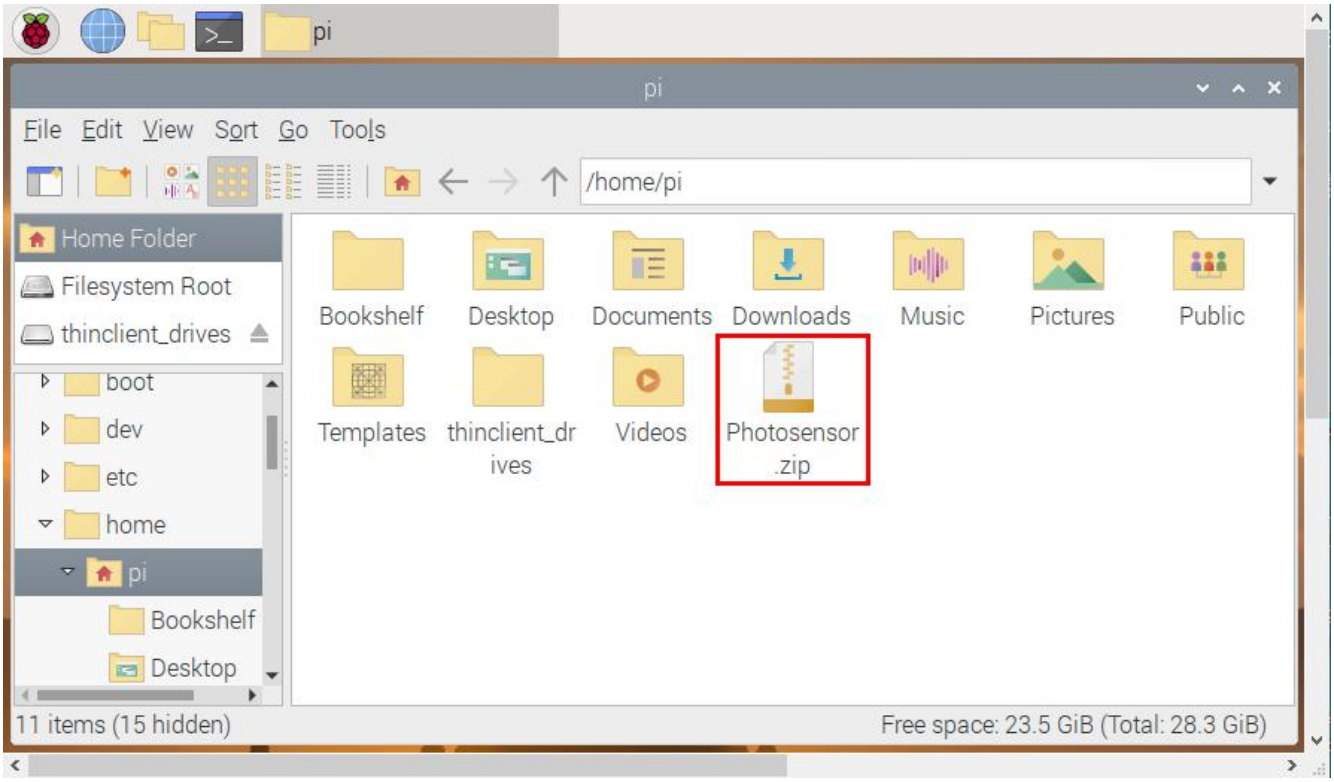


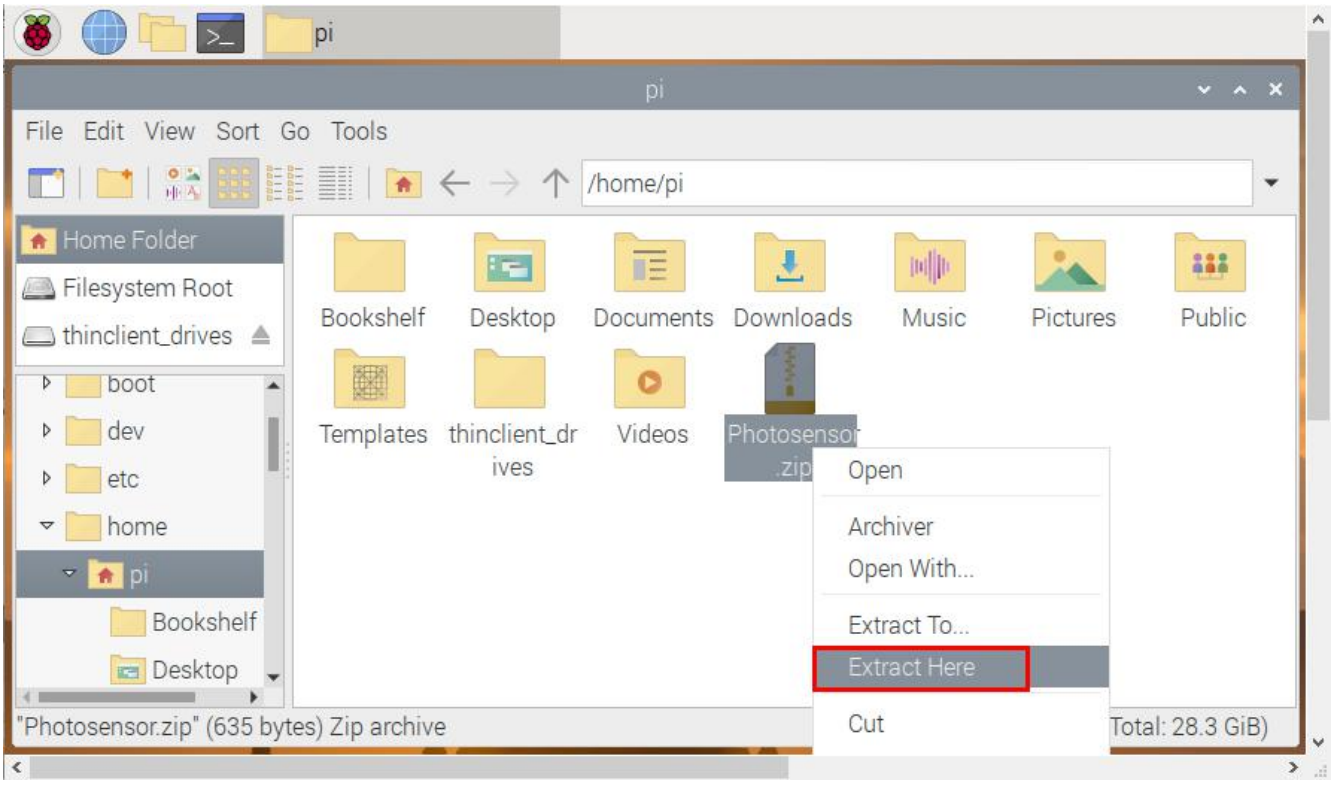
Check the address of the I2C module (PCF8591) connected to the Raspberry Pi, enter the command I2Cdetect -y 1, and then press **Enter**.
From the below picture, the I2C address of PCF8591 is 0x48 .



Copy the test code to Raspberry Pi system to run it

(1) Save the test code in the **pi** folder of Raspberry Pi system. Then place the Photosensor.zip file we provide in the **pi** folder, right-click and click **Extract Here.** As shown below:


pi
pi
File Edit View Sort Go Tools
/home/pi
Home Folder
Filesystem Root
thinclient_drives
boot
dev
etc
home
pi
Bookshelf
Desktop
Bookshelf
Desktop
Documents
Downloads
Music
Pictures
Public
Templates
thinclient_drives
Videos
Photosensor.zip
11 items (15 hidden)
Free space: 23.5 GiB (Total: 28.3 GiB)


pi
pi
File Edit View Sort Go Tools
/home/pi
Home Folder
Filesystem Root
thinclient_drives
boot
dev
etc
home
pi
Bookshelf
Desktop
Bookshelf
Desktop
Documents
Downloads
Music
Pictures
Public
Templates
thinclient_drives
Videos
Photosensor.zip
Open
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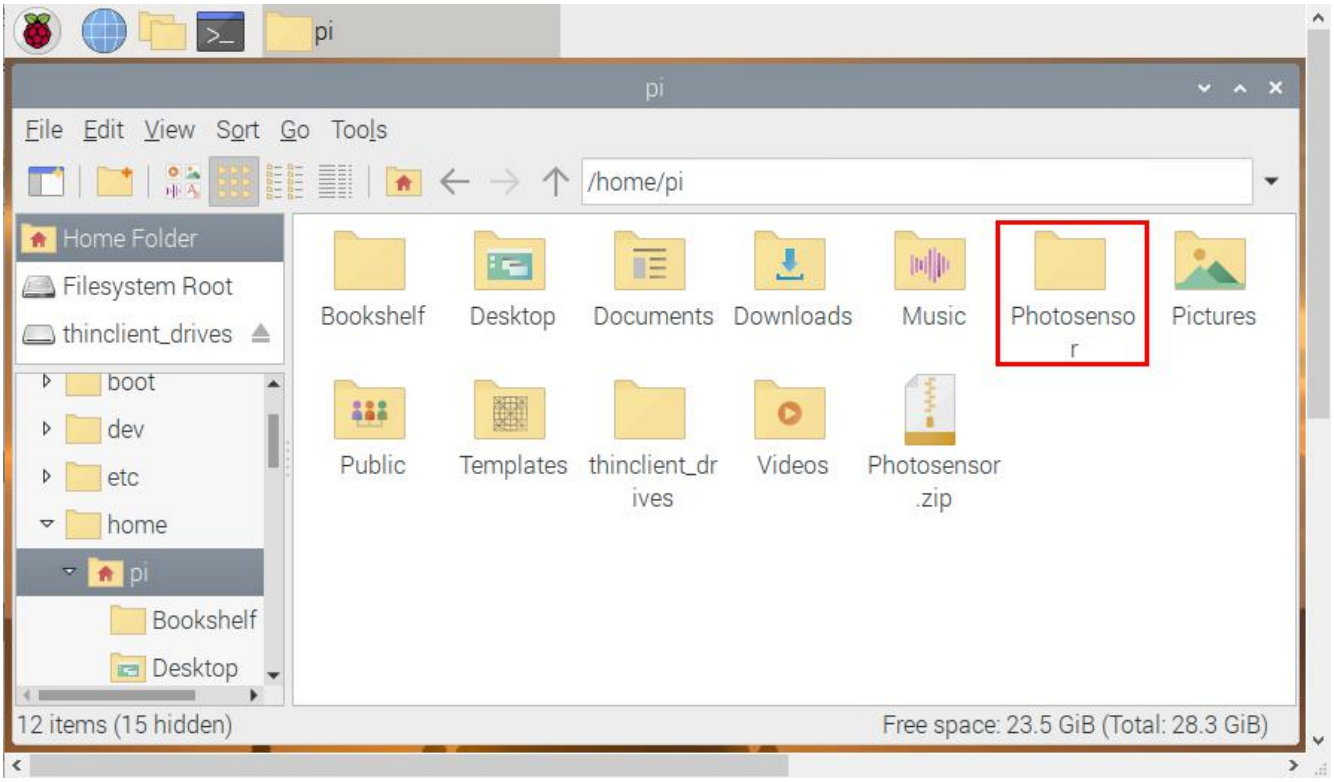
Open With...
Extract To...
Extract Here
Cut
"Photosensor.zip" (635 bytes) Zip archive
Total: 28.3 GiB)



(2) Compile and run test code:

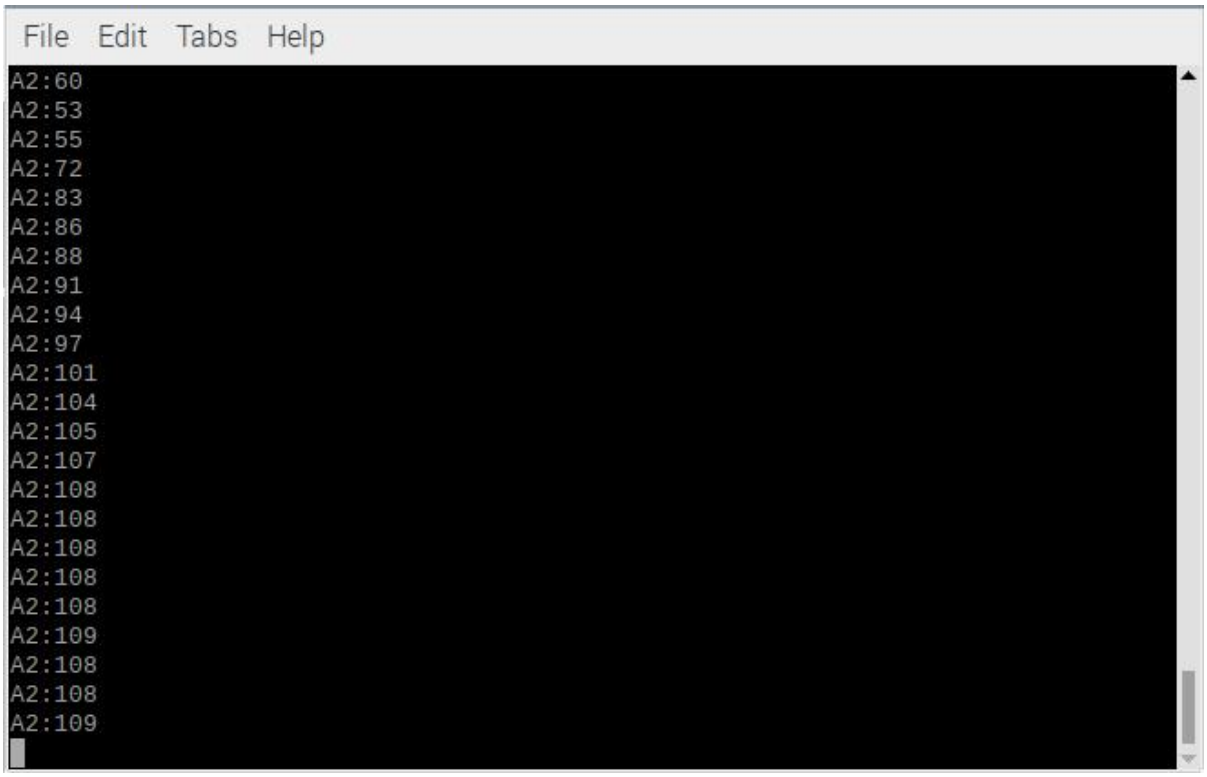
Input the following code and press"Enter"

```
cd /home/pi/Photosensor
gcc Photosensor.c -o Photosensor-lwiringPi
sudo ./Photosensor
```

(3) Test Result:

Insert the shield into the Raspberry Pi board. After programming finishes, the terminal will display the detected signals by the photoresistor.

Note: press Ctrl + C to exit code running



Test Code

File name: Photosensor.c

```
#include <wiringPi.h>
#include <pcf8591.h>  //pcf8591 library
#include <stdio.h>

#define Address 0x48  //I2Caddress
#define BASE 64      //DAC write address
#define A0 BASE+0    //A0 analogRead  address
#define A1 BASE+1    //A1 analogRead  address
#define A2 BASE+2
#define A3 BASE+3


int main(void)
{
    unsigned char value;
    wiringPiSetup();
    pcf8591Setup(BASE,Address);  //Initialize the pcf8591

    while(1)
    {
      value=analogRead(A2);    //Read the analog value of pin A2
      printf("A2:%d\n",value); //The terminal prints the simulated value
      delay(100);
    }
}
```

If you want to know how to utilize Raspberry Pi and the Raspberry Pi shield, you can refer to TS2180.