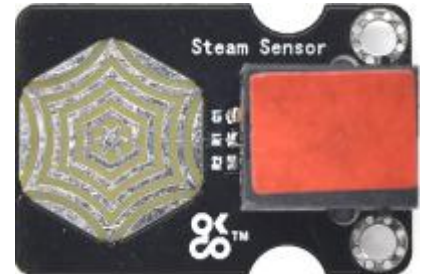


Steam Sensor (000x0000 Article Number) (TS2167)



Product Details

The TelePort steam sensor, an analog sensor, is used to detect the rains content. The more detected rains content, the larger the output voltage value.



Features and Benefits

- Compatible with RJ11 6P6C OKdo TelePort Control boards and expansion shields.
- The steam sensor is an analog sensor, that can be used to indicate water droplets from the rain or condensing steam droplets. As more of the sensor face is covered by water, the output signal will vary.

Technical Specifications

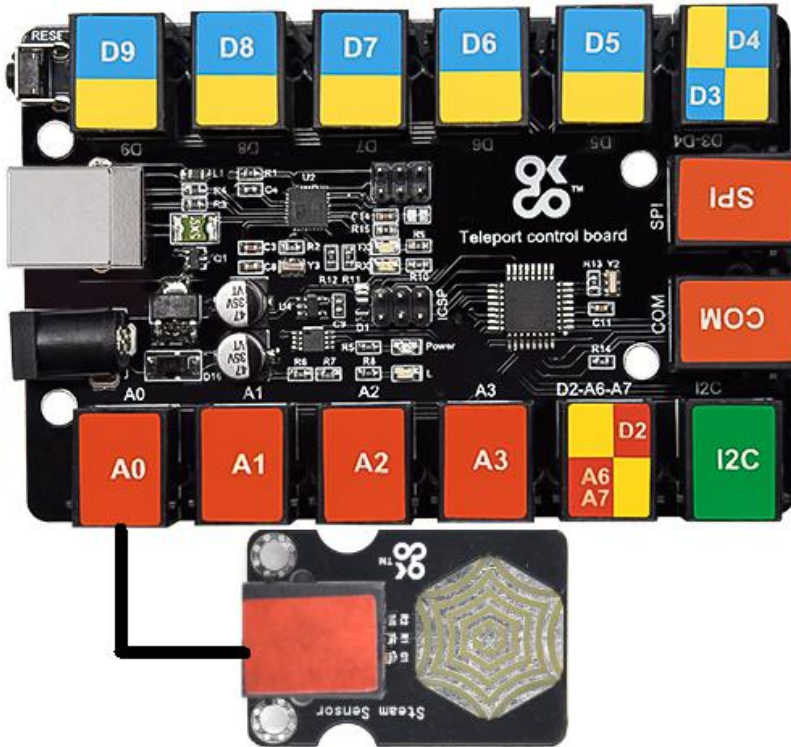
| | |
|---------------------|-----------------|
| Sensor type | Analog input |
| Working voltage | 3.3V-5V |
| Working Current | <20mA |
| Working Temperature | - 10°C ~ + 70°C |
| Dimensions | 35mm*24mm*18mm |
| Weight | 4.6g |

Applications

- Automatic wiper system
- Smart scuttle system
- Rains detector

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

➤ Arduino Application



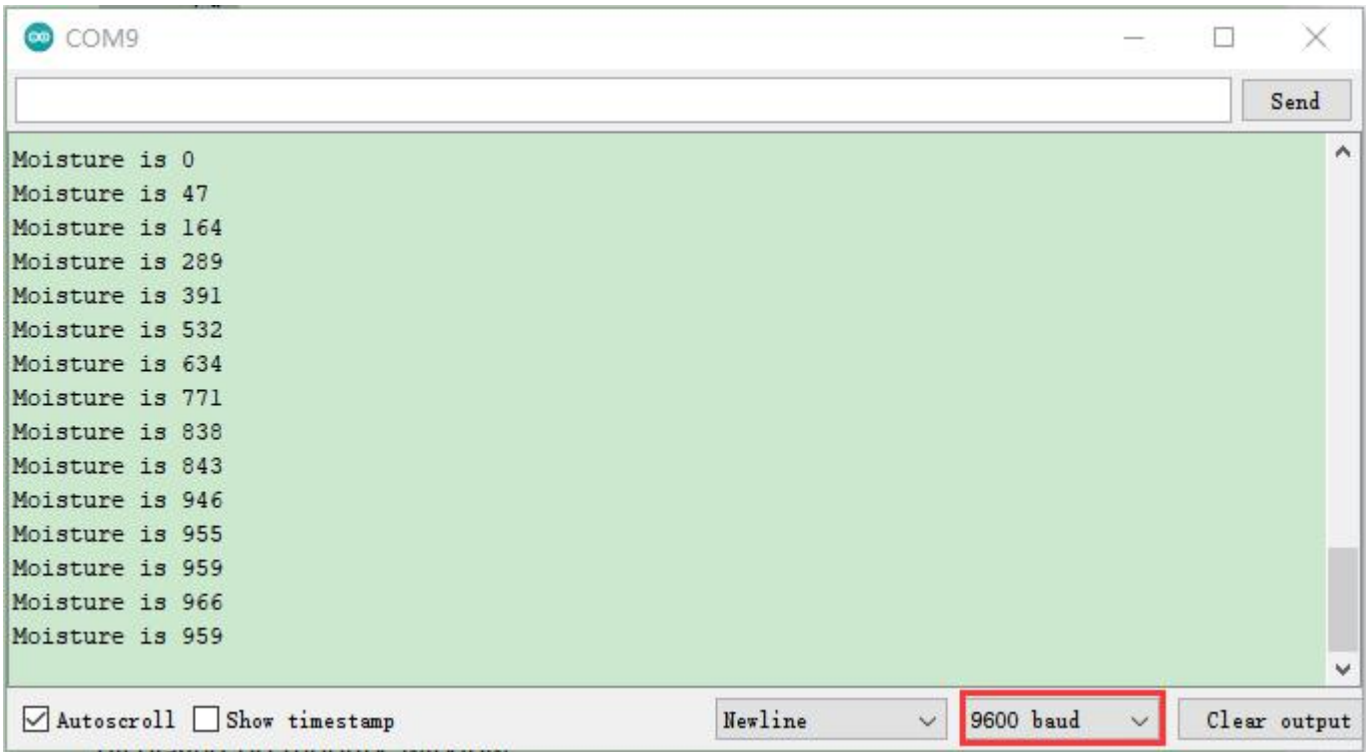
This module is compatible with the TS2178 TelePort control board.

Test Code

```
void setup()
{
  Serial.begin(9600); //open serial port, and set baud rate at 9600bps
}
void loop()
{
  int val;
  val=analogRead(0); //plug vapor sensor into analog port 0
  Serial.print("Moisture is ");
  Serial.println(val,DEC); //read analog value printed on serial port
  delay(100);
}
```

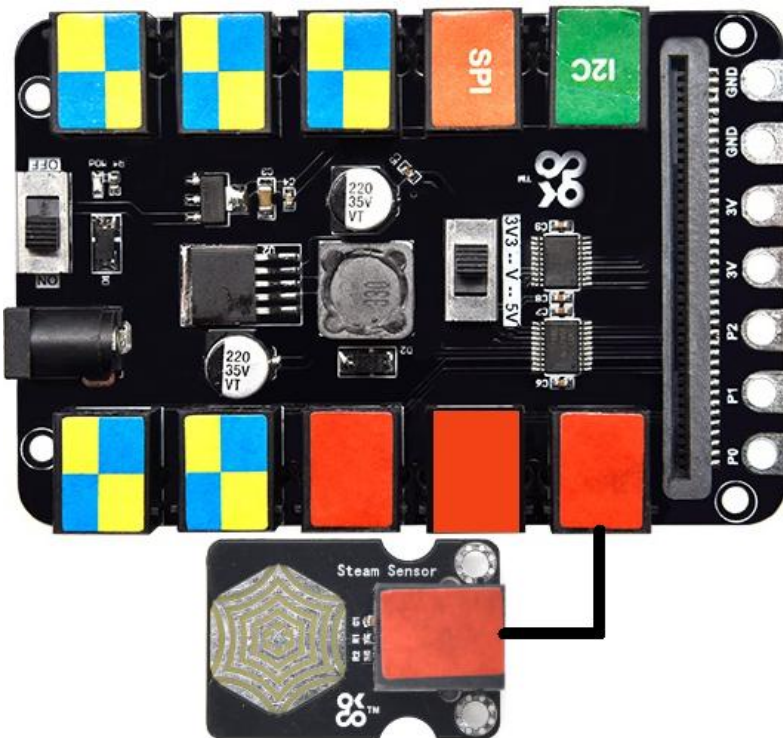
Test Result

Wire up, upload code, power it up, open serial monitor and set baud rate to 9600. When detecting different humidity, the sensor will output different values. If the sensing area of the sensor detects water, the analog value will be displayed on the serial monitor. As shown;



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



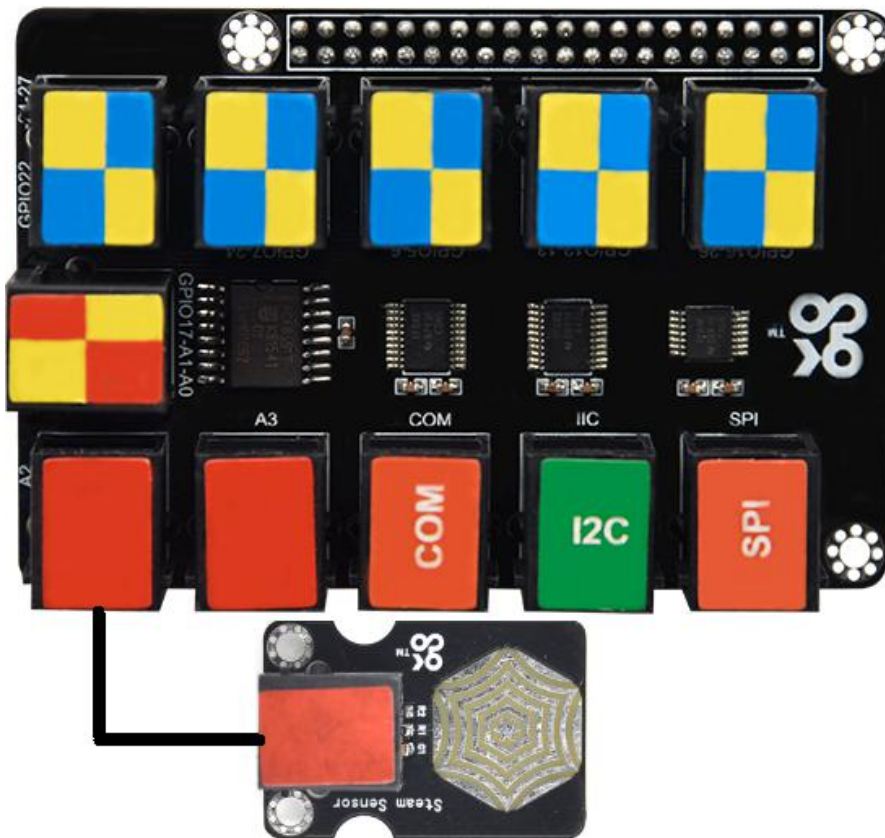
-①Run the "on start" block to boot the program
-②Open the LED matrix of the Micro:bit
-③The program is run circularly under the command of "forever" block
-④The Micro:bit shows the analog value detected by the steam sensor
-⑤delay in 100ms

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 the Micro:bit will display the analog value detected by the steam sensor.

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:

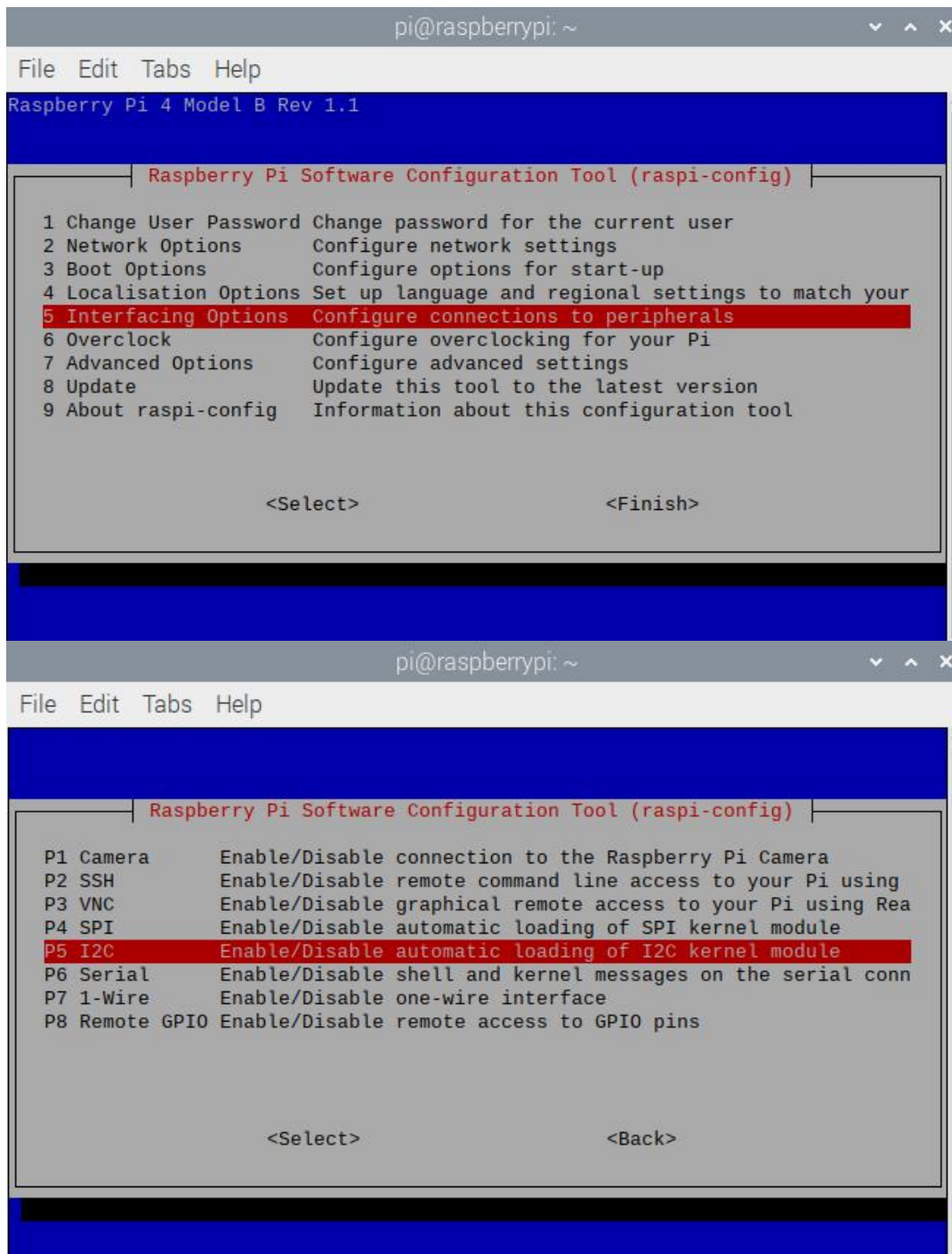
The Raspberry Pi itself does not have AD/DA function; therefore an expansion board with this function is required when connected to external analog sensors. And here we use a PCF8591 A/D converter with I2C communication.

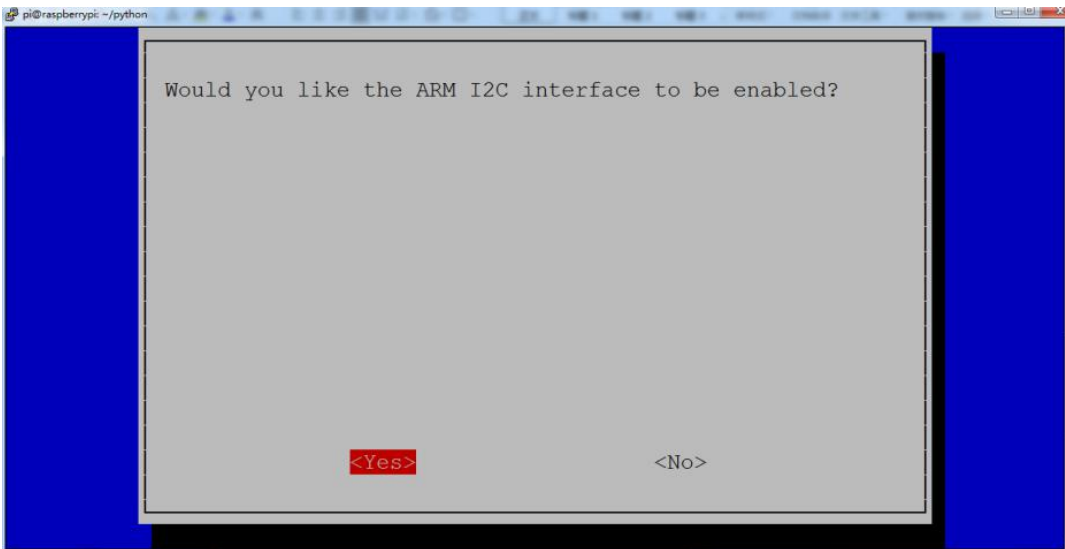
Enable the I2C communication function of the Raspberry Pi as follows:

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
```

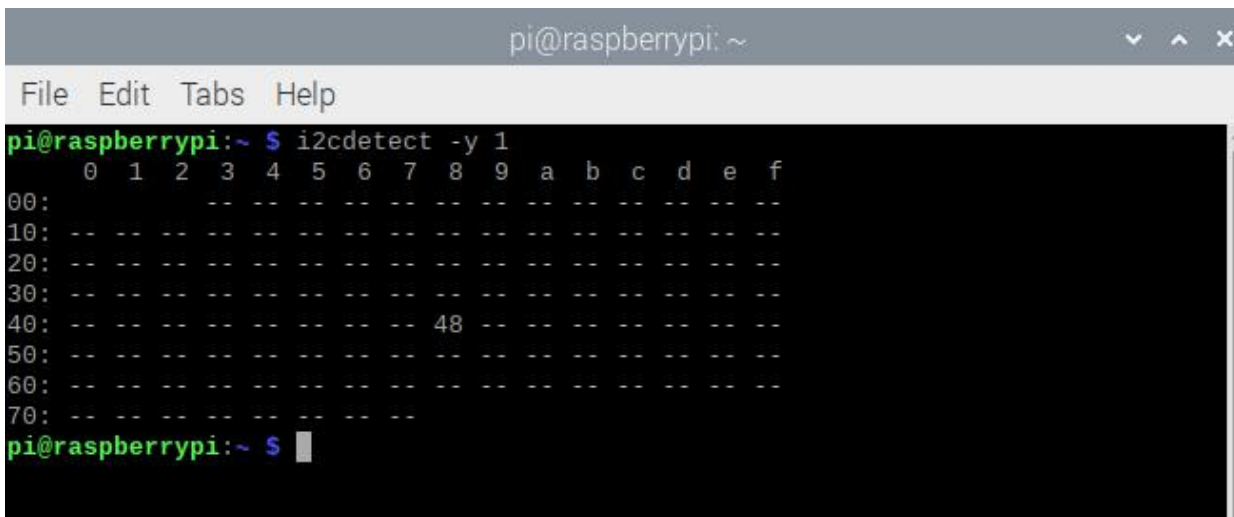
Follow the below instructions to enable the I2C function of Raspberry Pi:(press ←,↑,↓,→ then“Enter”)





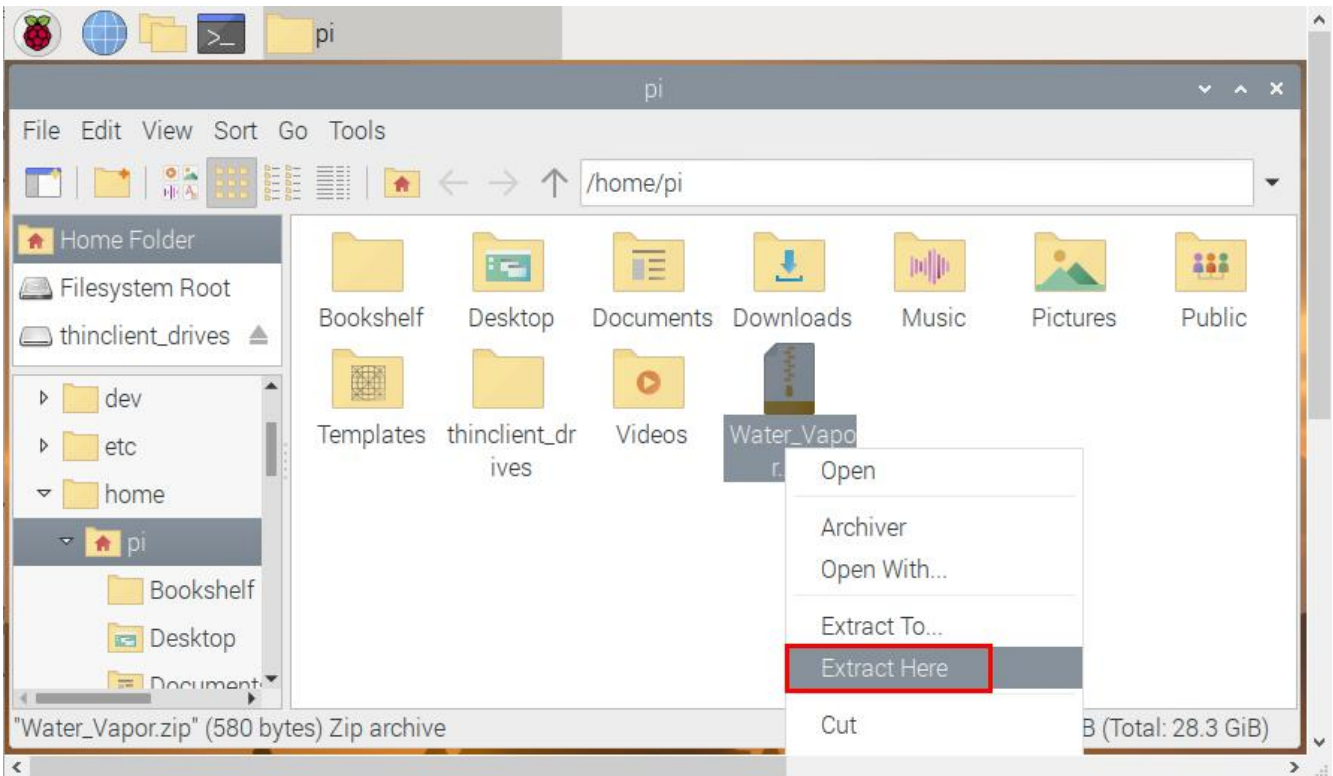
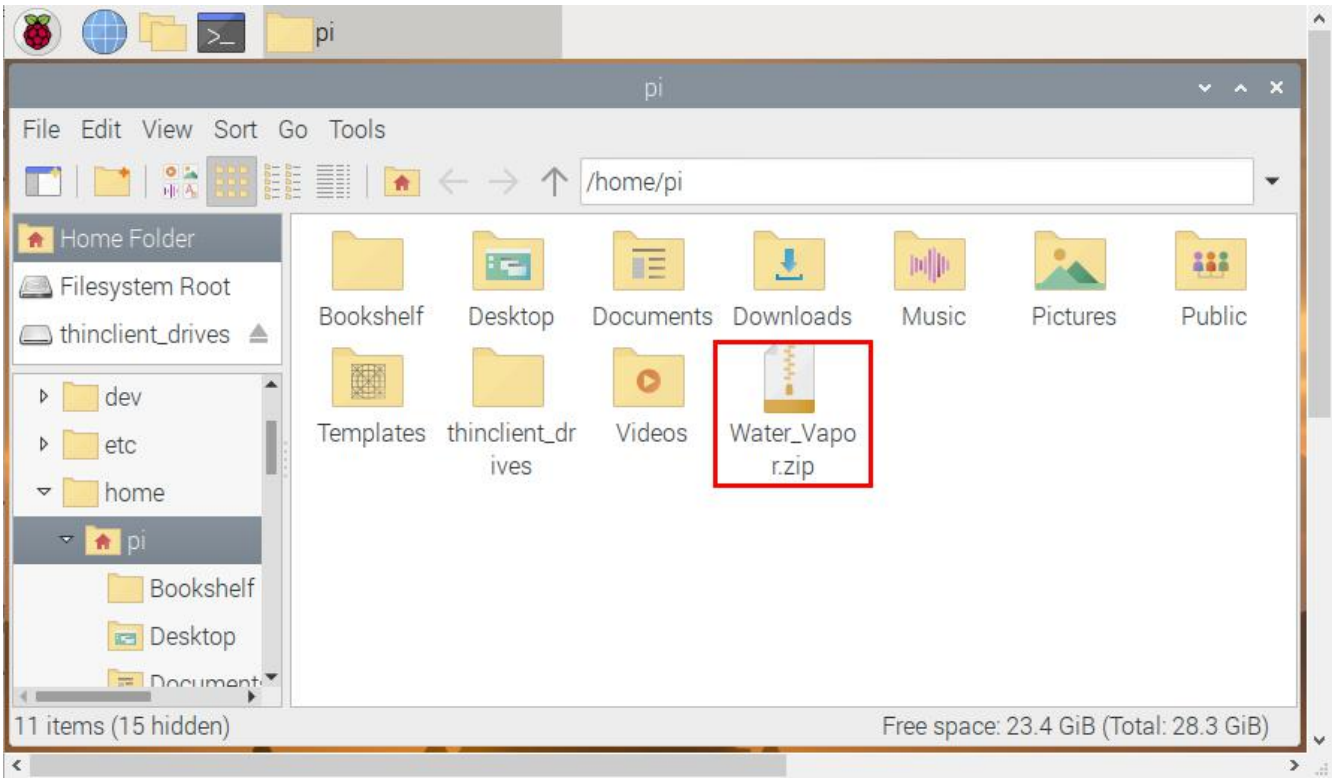
Check the address of the I2C module (PCF8591) connected to the Raspberry Pi, enter the command `i2cdetect -y 1`, and then press **Enter**.

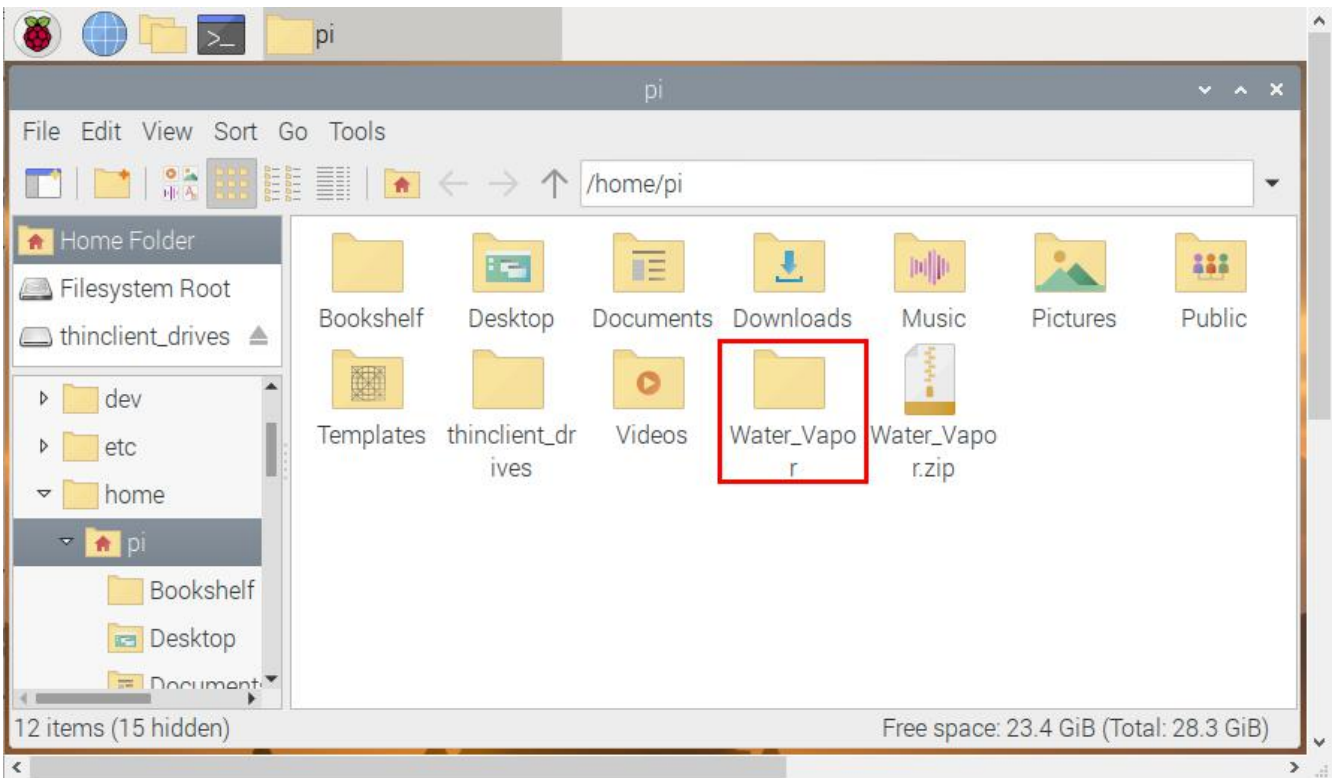
From the below picture, it is known that the I2C address of PCF8591 is 0x48 .



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 **Water_Vapor.zip** file we provide in the **pi** folder, right-click and click **Extract Here**. As shown below:





(2) Compile and run test code:

Input the following code and press "Enter"

```
cd /home/pi/Water_Vapor
gcc Water_Vapor.c -o Water_Vapor-IwiringPi
sudo ./Water_Vapor
```

(3) Test Result:

Insert the shield into the Raspberry Pi board. After programming finishes, then the terminal will display the analog value detected by the steam sensor.

Note: press **Ctrl + C** to exit code running

```
File Edit Tabs Help
water vapor value:0
water vapor value:0
water vapor value:11
water vapor value:83
water vapor value:135
water vapor value:153
water vapor value:164
water vapor value:169
water vapor value:177
water vapor value:186
water vapor value:189
water vapor value:192
water vapor value:194
water vapor value:195
water vapor value:195
water vapor value:192
water vapor value:189
water vapor value:189
water vapor value:189
water vapor value:191
water vapor value:192
water vapor value:195
water vapor value:196
```


Test Code

File name: [Water_Vapor.c](#)

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

#define Address 0x48
#define BASE 64
#define A0 BASE+0
#define A1 BASE+1
#define A2 BASE+2
#define A3 BASE+3

int main(void)
{
    unsigned char value;
    wiringPiSetup();
    pcf8591Setup(BASE,Address);

    while(1)
    {
        value=analogRead(A2); //Read the value of the water_vapor sensor
        printf("water vapor value:%d\n",value); //print data
        delay(100);
    }
}
```

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

END