

Line Tracking Sensor (000x0000 Article Number) (TS2147)



Product Details

The TelePort line tracking sensor(TCRT5000) has an infrared emission tube and an infrared receiver tube.

When the proper voltage is applied to the infrared transmitter, it emits infrared waves. When these waves collide with an object or don't be reflected back, the infrared receiver will be in the OFF state and high levels will be output; when infrared waves are reflected back, low levels will be output. It can also transmit digital signals to the control board so as to make robot follow black traces. This line tracking sensor is designed for the line tracking robot. Its detection height is 0-3cm.



Features and Benefits

- Compatible with RJ11 6P6C OKdo TelePort Control boards and expansion shields.
- Identifies white from black.
- Provides a stable TTL output signal. for an accurate line following robot or line counting device.

Technical Specifications

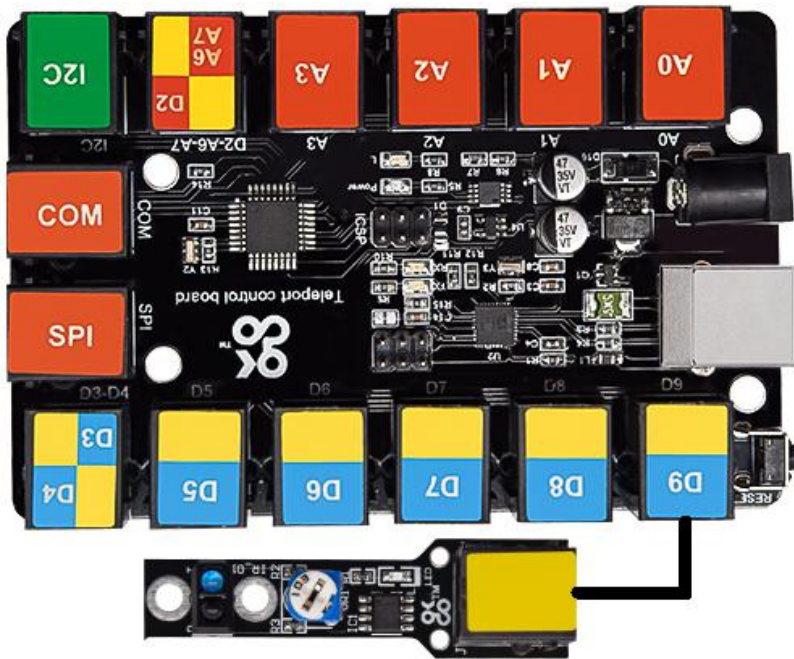
Sensor type	Digital input
Working voltage	5V
Operating current	<10mA
Operating temperature	0°C~ 50°C
Dimensions	57mm*16mm*18mm
Weight	4.8g

Applications

- Line tracking car
- Line tracking robots

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

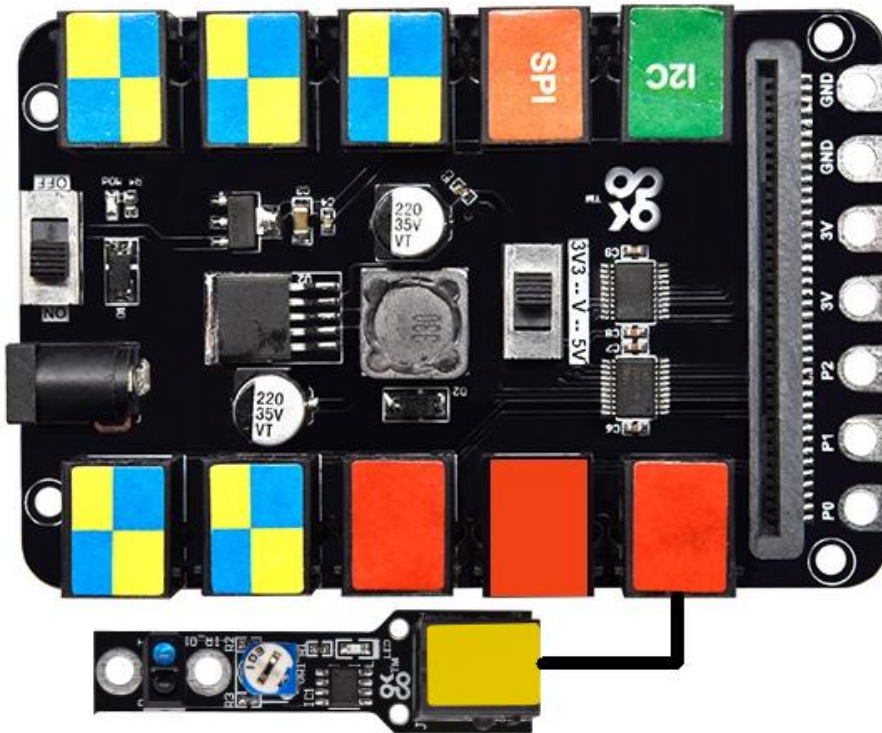
```
int Led=13;//define LED interface
int Trackingpin=9; //define Tracking sensor interface
int val;//define digital variable val
void setup()
{
pinMode(Led,OUTPUT);//define LED as output interface
pinMode(Trackingpin,INPUT);//define Tracking sensor as output interface
}
void loop()
{
val=digitalRead(Trackingpin);// read and assign the value of digital interface 9 to val
if(val==LOW)//When a signal is detected by Tracking sensor, LED will flash
{
digitalWrite(Led,HIGH);
}
else
{
digitalWrite(Led,LOW);
}
}
```

Test Result

Wire up, upload the test code and power it up. When the line tracking sensor detects white color, D13 of the control board will be on; if it detects black color, the D13 will be off.

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

```
on start
  led enable true

forever
  show number digital read pin P0
  if digital read pin P0 = 0 then
    show icon ♥
  else
    show icon 🍌
```

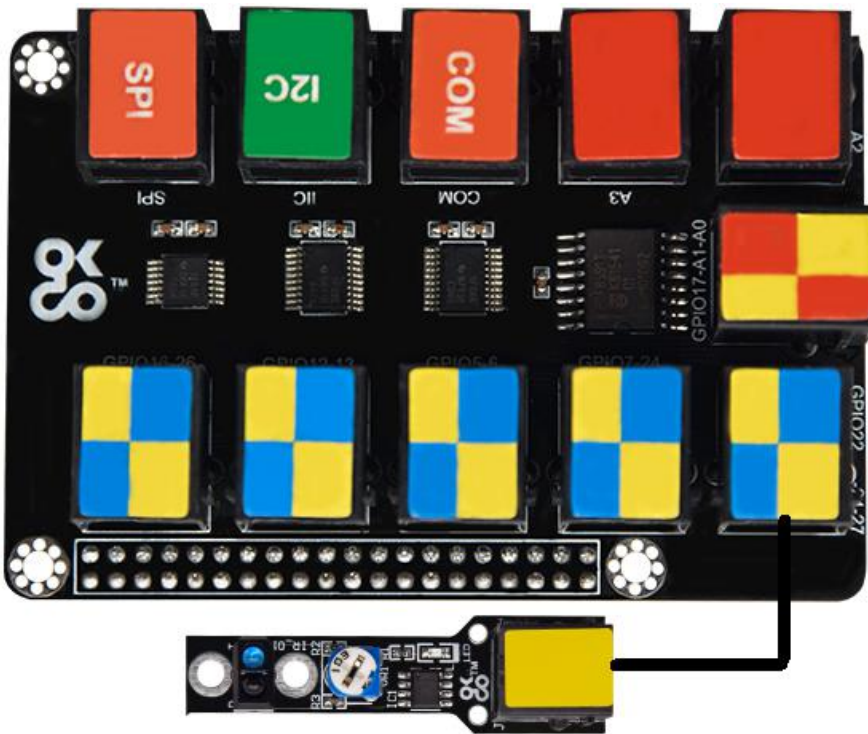
Test Result

Wire up, insert the Micro:bit V2.0 into the breadboard, turn on the switch to 5V, upload test code and power it up. When the line tracking sensor detects white color, the Micro:bit will show 0 and "♥"; if it detects black color, the Micro:bit will display 1 and "🍌".

-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 will display the digital signals detected by the line tracking sensor.
-⑤If P0=0, which indicates that the sensor detects white color, then execute the program under then
-⑥the Micro:bit will display "♥"
-⑦If P0=1, which indicates the sensor detects black color, then execute the program under else
-⑧the Micro:bit will show "🍌"

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

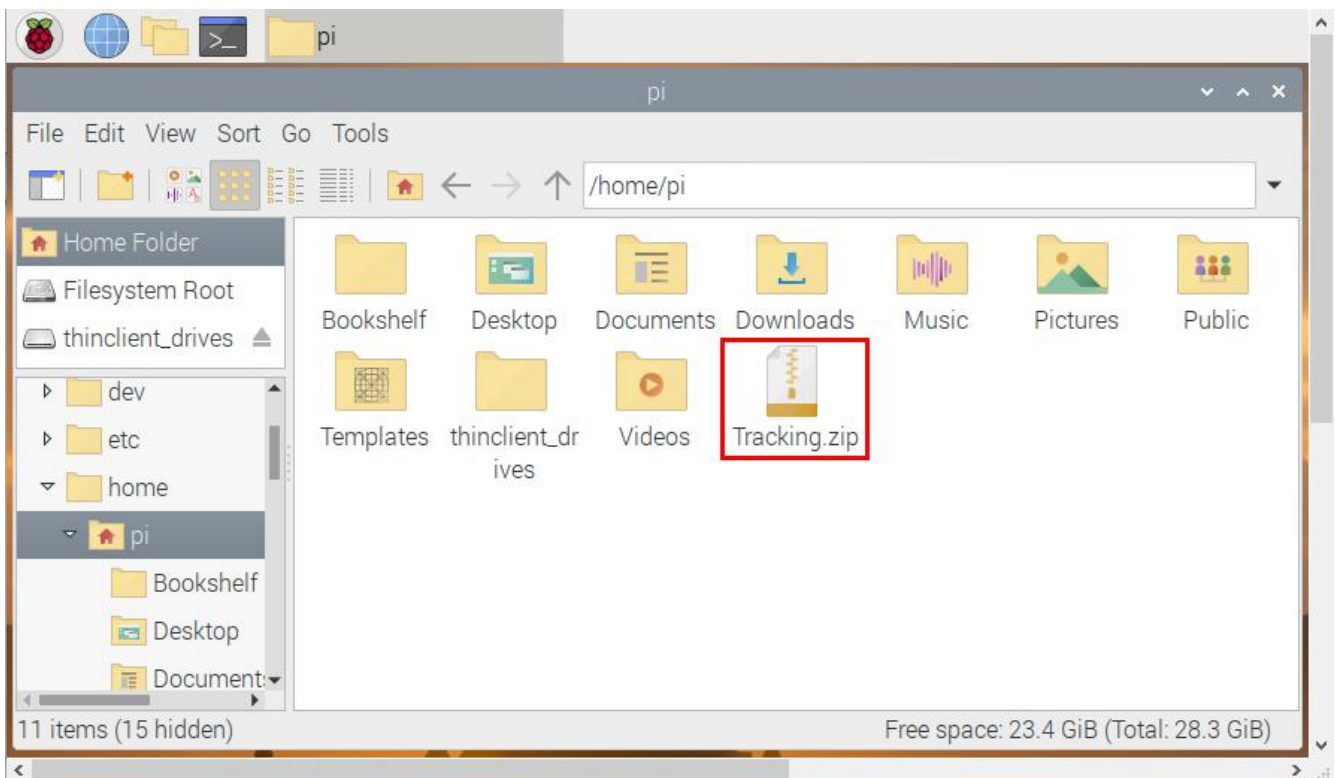
➤ **Raspberry Pi Application**

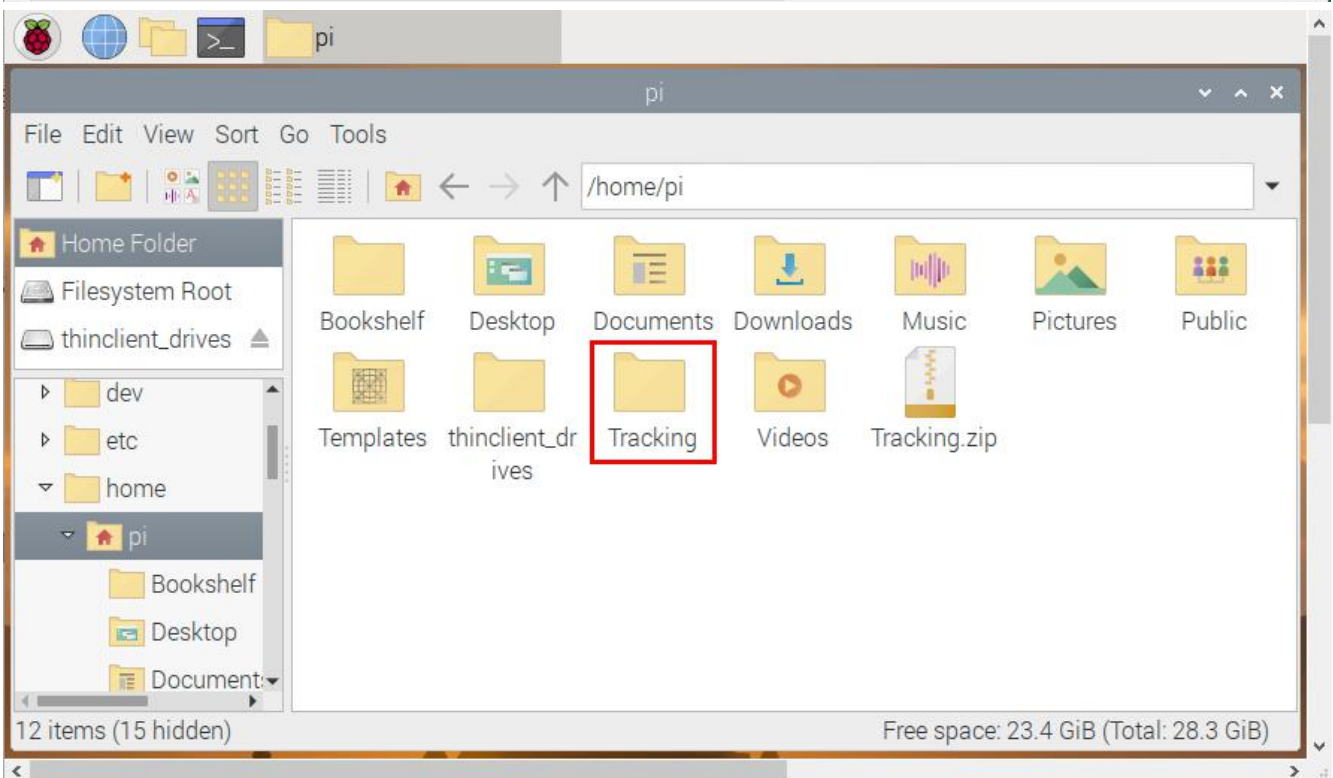
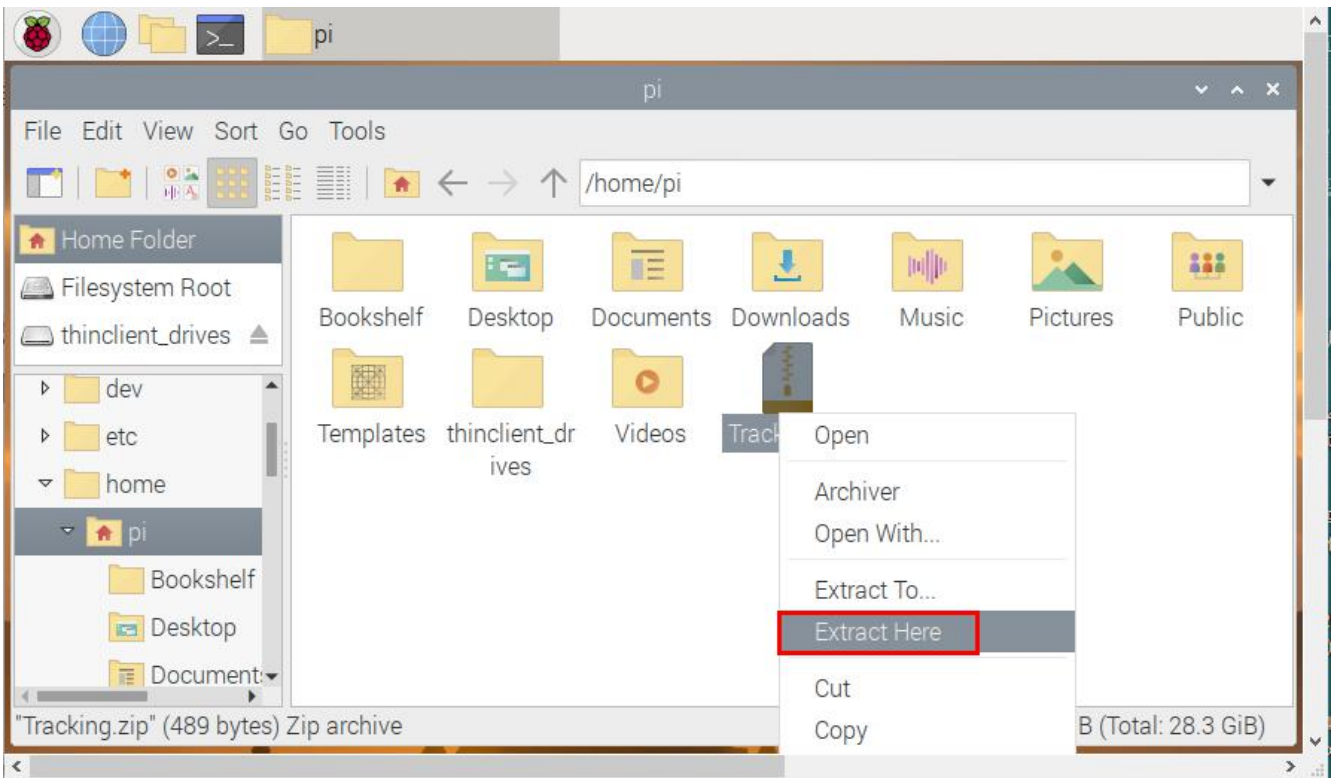


This module is compatible with the Raspberry Pi board and the TS2180 Raspberry Pi shield.

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





(2) Compile and run test code:

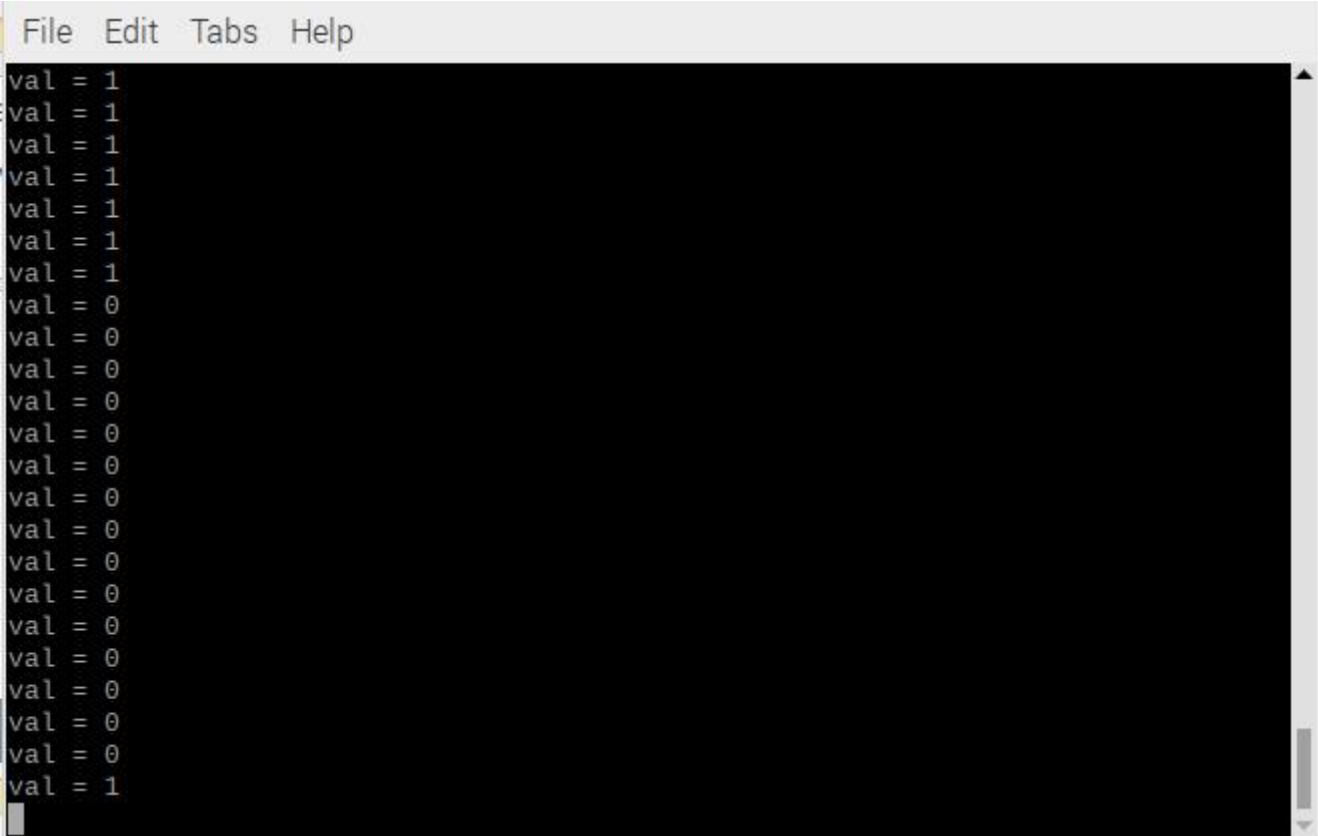
Input the following code and press "Enter"

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

(3) Test Result:

Insert the shield into the Raspberry Pi board. After programming finishes, when the sensor detects white color, the terminal will print 0; on the contrary, the terminal will print 1.

Note: press Ctrl + C to exit code running



```
File Edit Tabs Help
val = 1
val = 1
val = 1
val = 1
val = 1
val = 1
val = 1
val = 1
val = 1
val = 1
val = 0
val = 0
val = 0
val = 0
val = 0
val = 0
val = 0
val = 0
val = 0
val = 0
val = 1
```

Test Code

File name: **Tracking.c**

```
#include <wiringPi.h>
#include <stdio.h>
#define TrackingPin 3 //BCM GPIO 22

int main()
{
    wiringPiSetup();
    char val;
    {
        pinMode(TrackingPin,INPUT);
    }

    while(1)
    {
        val=digitalRead(TrackingPin);
        printf("val = %d\n",val);
        delay(50);
    }
}
```

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

END