## Product Details

These are the TelePort servo expansion board and a servo. When we make an experiment with an TelePort control board and a servo, a TelePort servo module is needed.

The servo shield has three pin headers of 2.54mm pin pitch, fully compatible with the port of the servo .

In general, the servo has three lines in brown, red and orange. The brown wire is grounded, the red one is a positive pole line and the orange one is a signal line.

The rotation angle of servo motor is controlled by regulating the duty cycle of PWM (Pulse-Width Modulation) signal. The standard cycle of PWM signal is 20ms (50Hz). Theoretically, the width is distributed between 1ms-2ms, but in fact, it's between 0.5ms-2.5ms. The width corresponds the rotation angle from 0° to 180°. But note that for different brand motors, the same signal may have different rotation angles.
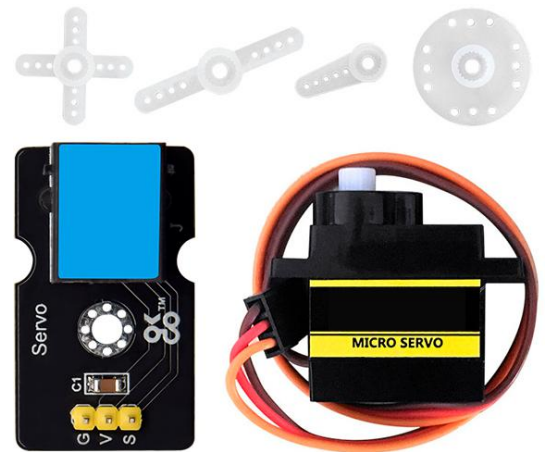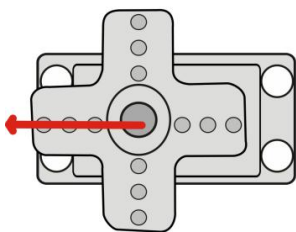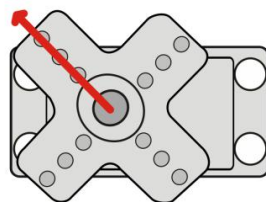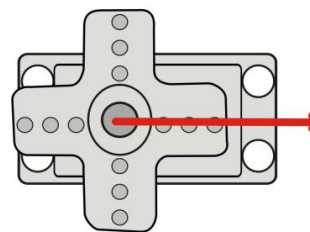

0°	45°	180°
high / low 500microsec	high / low 1000microsec	high / low 2500microsec

Features and Benefits

- Compatible with RJ11 6P6C OKdo TelePort Control boards and expansion shields.
- Easily connect the included 0˚-180˚ servo or other servos to your microcontroller with this shield.
- Operating voltage between 4.8V to 6V.

Technical Specifications

| Sensor type	Digital output
Working Voltage	DC 5V
Angle range	about 180°(in 500→2500μsec)
Pulsewidth range	500→2500μsec
No-load speed	0.12±0.01 sec/60（DC 4.8V）；0.1±0.01 sec/60（DC 6V）
No-load current	200±20mA（DC 4.8V）；220±20mA（DC 6V）
Stop torque	1.3±0.01kg/cm（DC 4.8V）；1.5±0.1kg/cm（DC 6V）
Stop current	≦850mA（DC 4.8V）；≦1000mA（DC 6V）
Standby current	3±1mA（DC 4.8V）；4±1mA（DC 6V）
Operation temperature	-10℃〜50℃
Save temperature	-20℃〜60℃

Applications

- Maneki Neko
- DOF robots
- Footprint lock
- Turntable
- Remote control aircraft, model ships

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

➢ **Arduino Application**

Servo shield	Servo
G	Brown Wire
V	Red Wire
S	Orange Wire
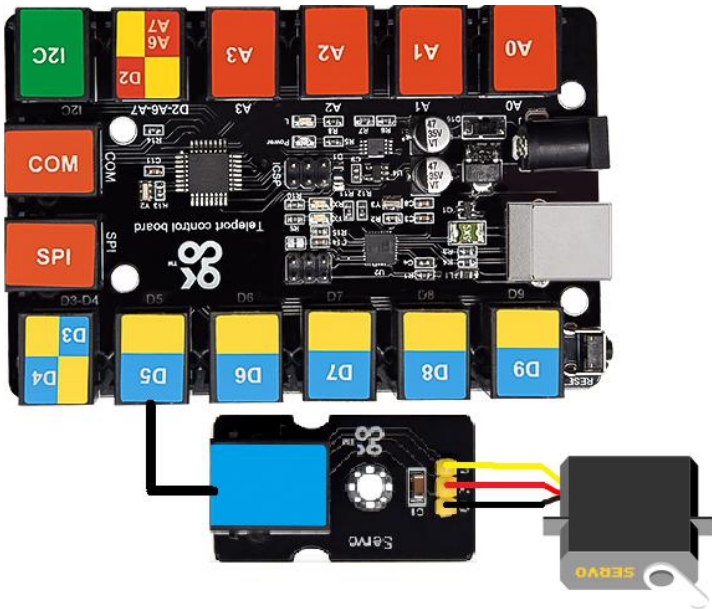
This module is compatible with the TS2178 TelePort control board.

Test Code

Before compiling test code, remember to place the corresponding library in the libraries of Arduino IDE.
Unzip the library files, that is, copy the unzipped the **Servo** folder into the libraries of Arduino IDE.
After pasting it, reboot the compiler.
For instance: C:\Program Files\Arduino\libraries

```
#include <Servo.h>
Servo myservo;// Define steering gear name
void setup()
{
myservo.attach(5);// Select steering gear pin (5)
}
void loop()
{
myservo.write(0);// Set the rotation Angle of the motor
delay(500);  //delay 500ms
myservo.write(45);
delay(500);
myservo.write(90);
delay(500);
myservo.write(135);
delay(500);
myservo.write(180);
delay(500);
}
```
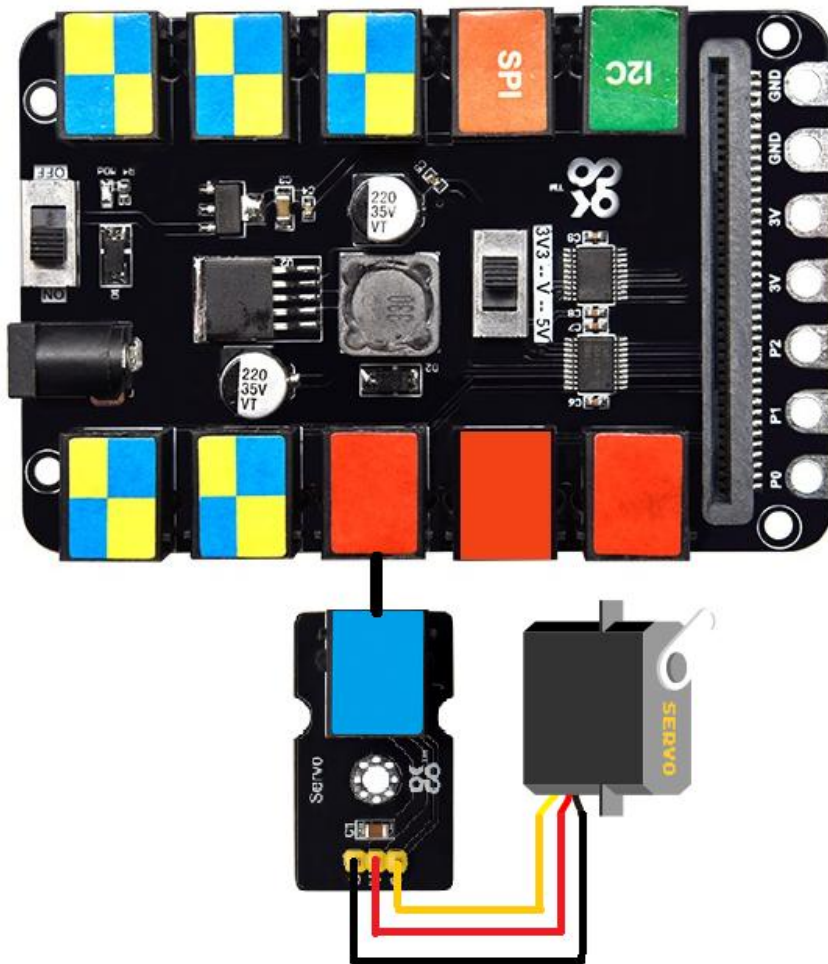
Test Result
Wire up, upload code and power it up. Then the servo will rotate to 0°, 45°, 90°, 135°and 180°; circularly.

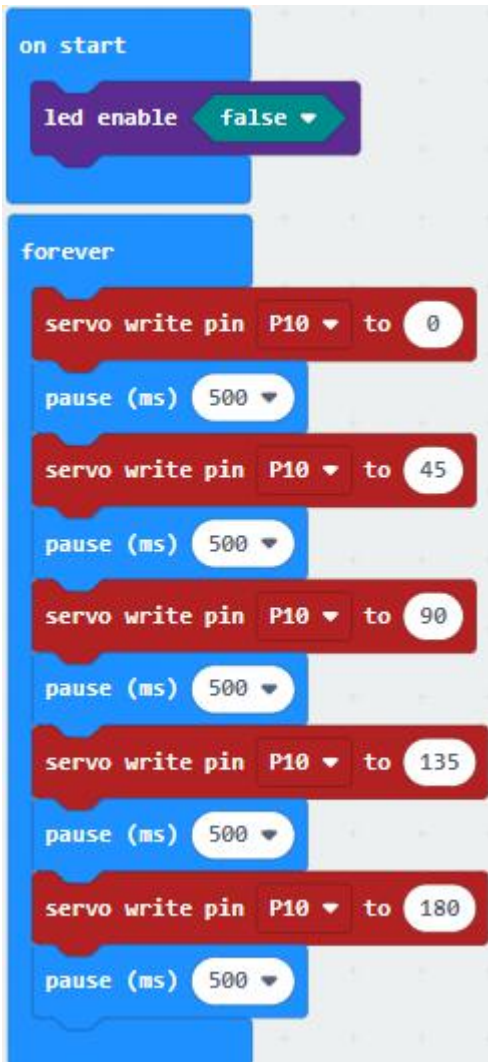If you want to know more details about Arduino and the TelePort control board, you can refer to TS2178.

Micro:bit Application

Servo shield	Servo
G	Brown Wire
V	Red Wire
S	Orange Wire

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
............②the LED of the Micro:bit board goes off
............③The program is run circularly under the command of "forever" block
............④the servo connected to P10 rotate to 0°.
............⑤delay in 500ms
............⑥the servo connected to P10 rotate to 45°.
............⑦delay in 100ms
............⑧the servo connected to P10 rotate to 90°.
............⑨delay in 500ms
............⑩the servo connected to P10 rotate to 135°.
............⑪delay in 100ms
............⑫the servo connected to P10 rotate to 180°.
............⑬delay in 100ms

Test Result

Wire up, insert the Micro:bit V2.0 into the shield, turn DIP switches to 5V and ON end, upload test code and power it up(above 5V).
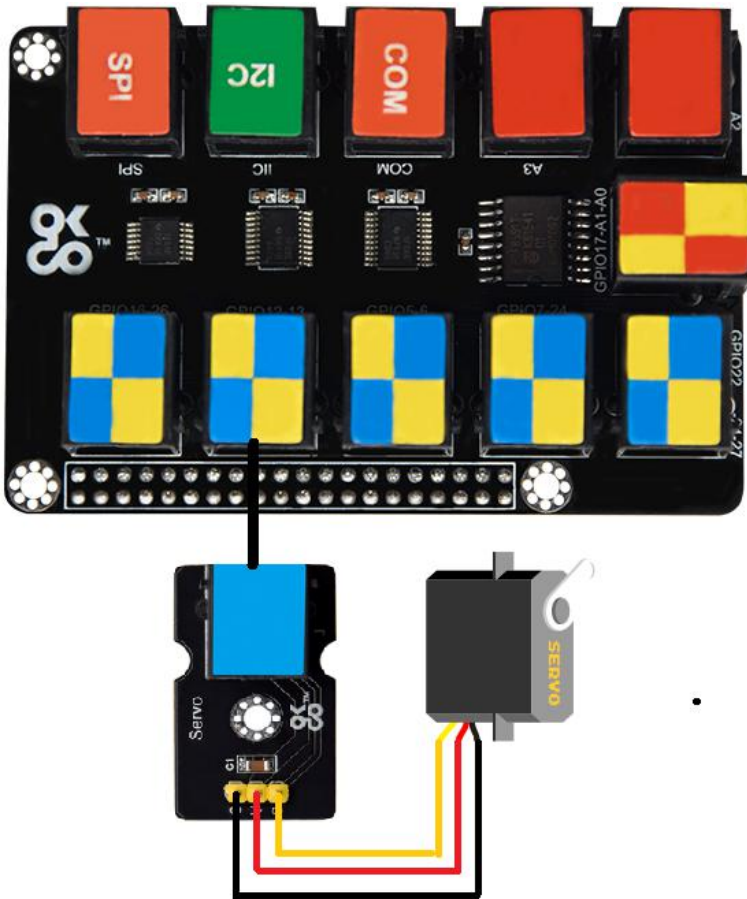
Then the servo will rotate to 0°, 45°, 90°, 135°and 180°; circularly.

Test Result

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

➢ **Raspberry Pi Application**

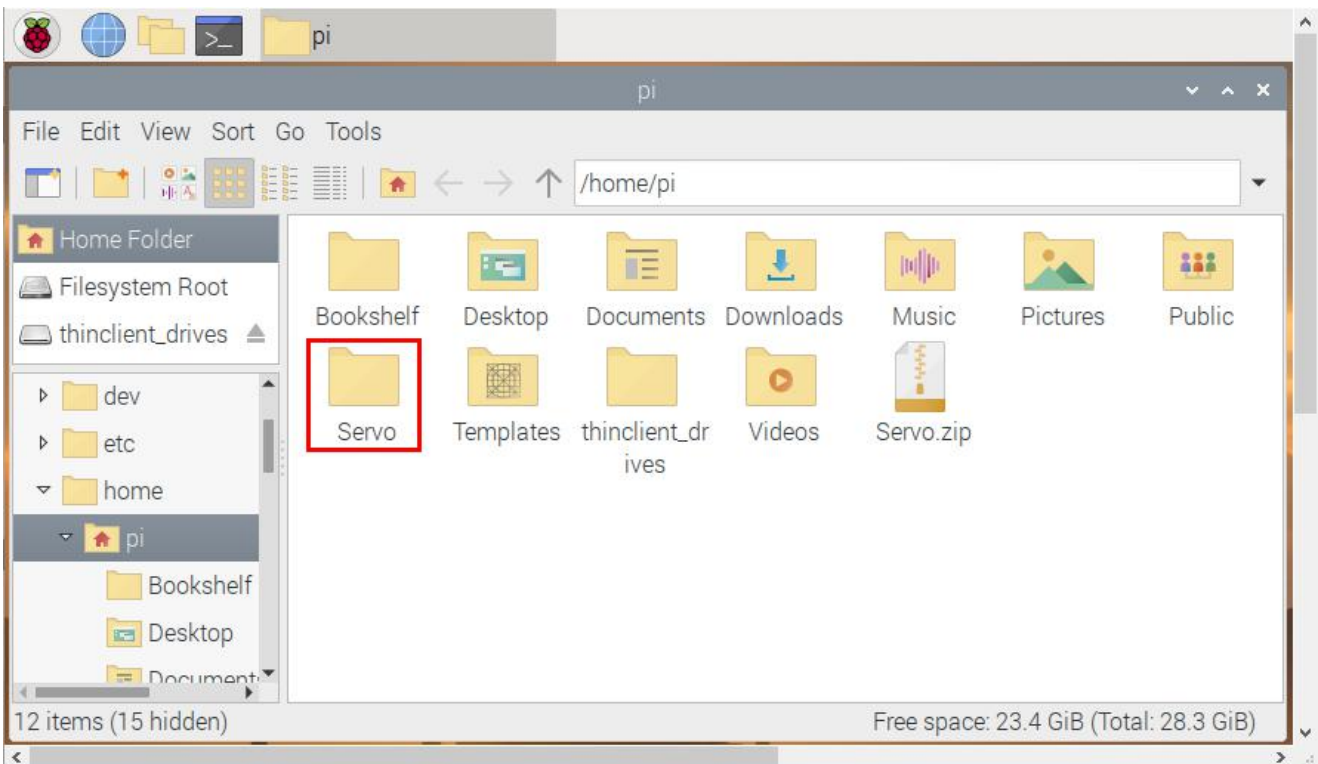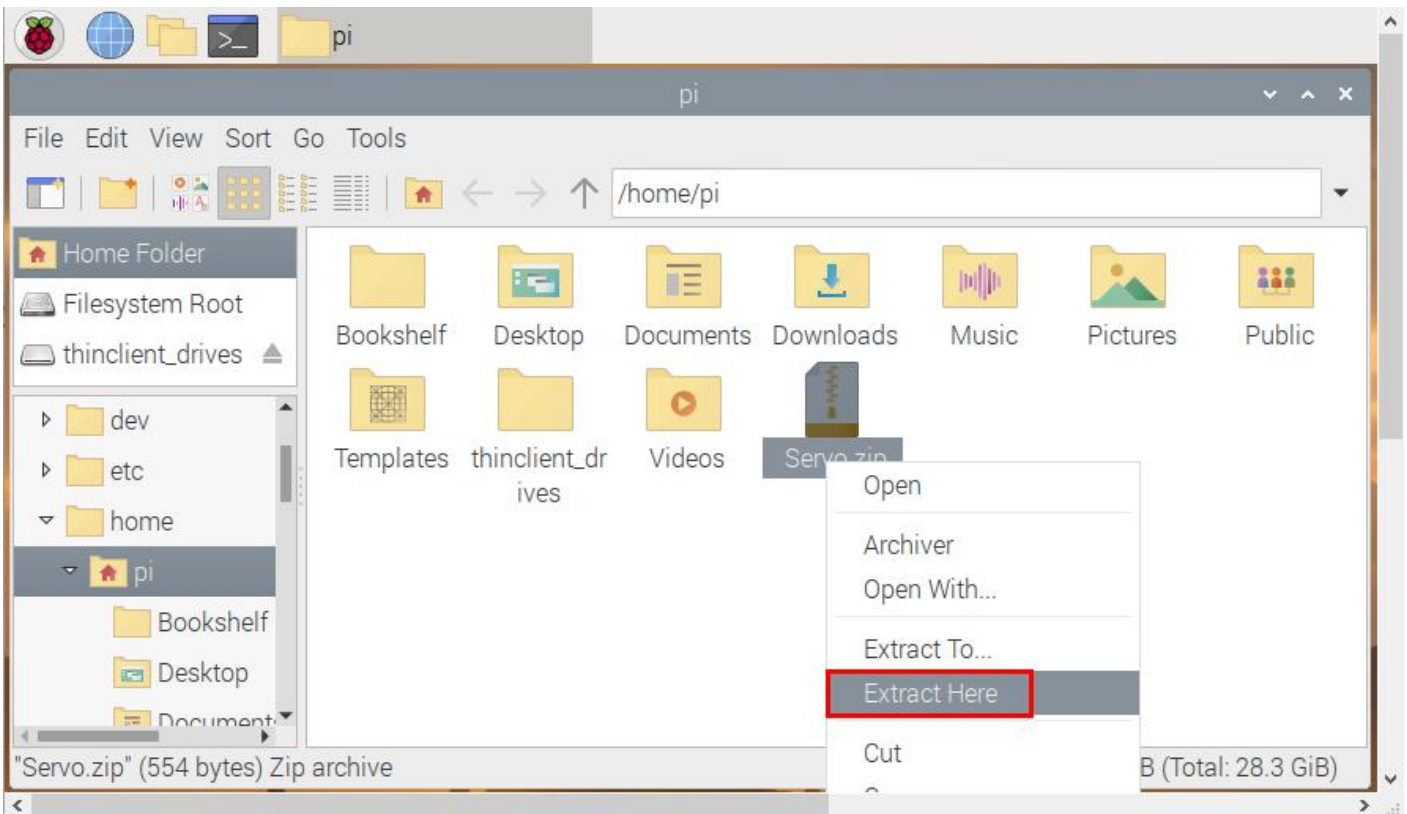| Servo shield	Servo
G	Brown Wire
V	Red Wire
S	Orange Wire

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 **Servo.zip** file we provide in the **pi** folder, right-click and click **Extract Here.** As shown below:
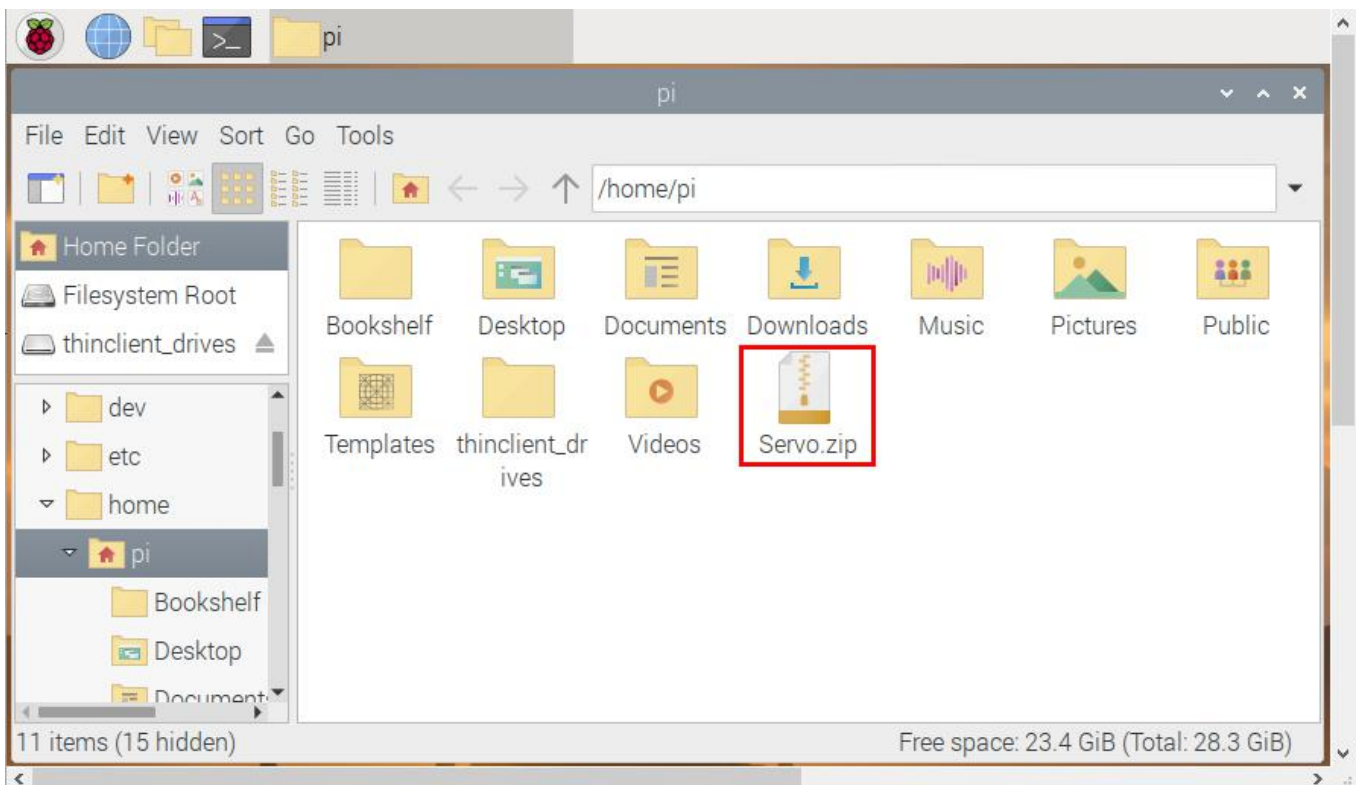
(2) Compile and run test code：

  Input the following code and press"Enter"

    cd /home/pi/Servo
    gcc Servo.c -o Servo -lwiringPi
    sudo ./Servo

(3) Test Result：

Insert the shield into the Raspberry Pi board. After programming finishes,， the servo rotates in the range of 0°-180°

Test Code

File name: Servo.c

```c
#include <wiringPi.h>
#define serPin 23 //servo pin BCM GPIO 13

int main()
{
        wiringPiSetup();
        pinMode(serPin,OUTPUT);
        int i;
        for(;;)
        {
                for(i=0;i<50;i++)
                {
                        digitalWrite(serPin,HIGH);
                        delayMicroseconds(500); //Pulse width 0.5ms, Angle 0
                        digitalWrite(serPin,LOW);
                        delay(20-0.5);  //Cycle 20 ms
                }

                delay(1000);
                for(i=0;i<50;i++)
                {
                        digitalWrite(serPin,HIGH);
                        delayMicroseconds(2500);
                        digitalWrite(serPin,LOW);
                        delay(20-2.5);
                }
        delay(1000);
            }
        return 0;
}
```

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

END