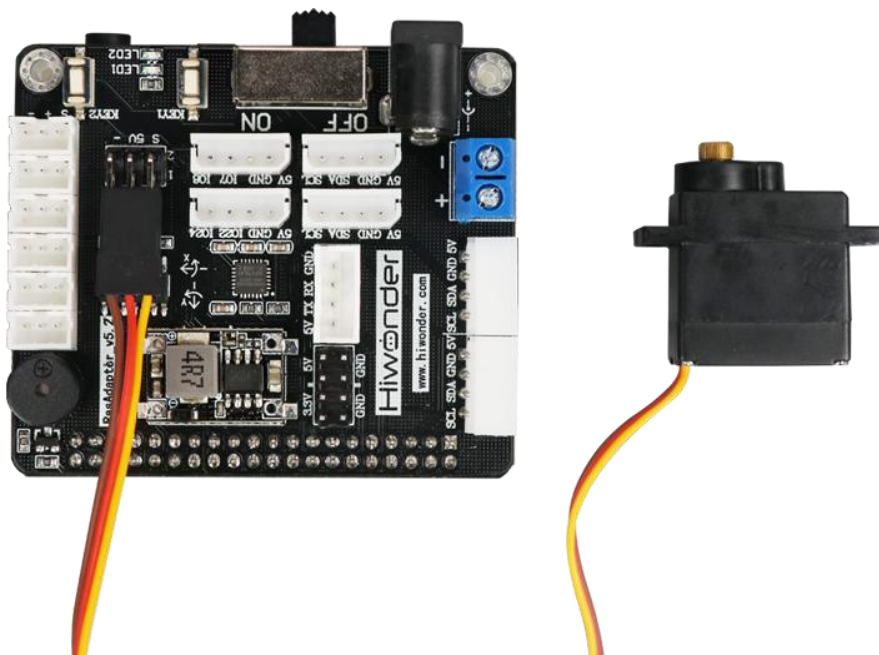


Lesson 3 Digital Servo Control

1. Preparation

Connect each digital servo to No.2 servo port on the Raspberry Pi extension board separately. Take the LFD-01M servo as an example.



Note: Connect yellow signal wire to S, red power wire to + and brown ground wire to -. Please do not mix the connection!

2. Operation Steps

1) Click the icon shown below to enter the LX terminal command line.



2) Enter the command “`cd TonyPi/Example/`” in the interface and press “Enter” to switch to the directory where the routine is located.

```
pi@raspberrypi:~ $ cd TonyPi/Example/
pi@raspberrypi:~/TonyPi/Example $
```

- 3) Input command "**sudo python3 PWMServoMoveDemo.py**" and press "Enter" to control one servo rotation.

```
pi@raspberrypi: ~/TonyPi/HiwonderSDK
File Edit Tabs Help
pi@raspberrypi:~/TonyPi/HiwonderSDK $ sudo python3 PWMServoMoveDemo.py
*****Function:Hiwonder TonyPi expansion board, PWM servo control routine*****
***
*****
-----
Official website:http://www.hiwonder.com
Online mall:https://huaner.tmall.com/
-----
The following commands need to be used in the LX terminal, which can be opened b
y ctrl+alt+t, or click
Click the black LX terminal icon in the upper bar
-----
Usage:
  sudo python3 BusServoMove.py
-----
Version: --V1.1 2020/10/07
-----
Tips:
* Press Ctrl+C to close the program, if it fails, please try multiple times!
-----
```

- 4) Press "Ctrl+C" can close the program.

3. Working Principle

Control the digital servo to rotate by sending pulse signal.

The source code of program is located in
/home/pi/TonyPi/HiwonderSDK/PWMServoMoveDemo.py

```
25 while True:
26     # Parameter: parameter1: the port number of servo; parameter2: position; parameter3: running time
27     Board.setPWMServoPulse(2, 1500, 500) # the running time is 500ms when No.2 servo rotates to the poition 1500
28     time.sleep(0.5) # the delay time is the same as the running time
29
30     Board.setPWMServoPulse(2, 1800, 500) # the rotation range of servo is between 0° and 180°, corresponding to 500-2500 pulse width, that is,
31     time.sleep(0.5) # parameter 2 ranges from 500 to2500
32
33     Board.setPWMServoPulse(2, 1500, 200)
34     time.sleep(0.2)
35
36     Board.setPWMServoPulse(2, 1800, 500)
37     Board.setPWMServoPulse(1, 1800, 500)
38     time.sleep(0.5)
39
40     Board.setPWMServoPulse(2, 1500, 500)
41     Board.setPWMServoPulse(1, 1500, 500)
42     time.sleep(0.5)
```

Control the digital servo through calling `setPWMServoPulse()` function in Board library. Take the code `Board.setPWMServoPulse(2, 1500, 500)` as example:

The first parameter “2” represents the port number of digital servo. Here is the No.2 port.

The second parameter “1500” represents the rotation position, which is the data obtained through angle conversion.

The third parameter “500” represents the rotation time (the unit is ms).

The rotation of digital servo ranges from 500 to 2500 pulse width, which is 0-180° through angle conversion, that is, 1° is approximately equal to 11.1 pulse width.

The conversion formula of angle and pulse width: $\text{pulse width} = 11.1 * \text{angle} + 500$.

(this formula is only for conversion reference).

4. Project outcome

The digital servo connect to the Raspberry Pi expansion board will rotate to specified position.