

Running Motors with Picon Zero

Requirements:

- Picon Zero
- DC Motors (various)
- Raspberry Pi Connected to Internet, keyboard and screen
- Raspberry Pi already setup following Worksheet 01

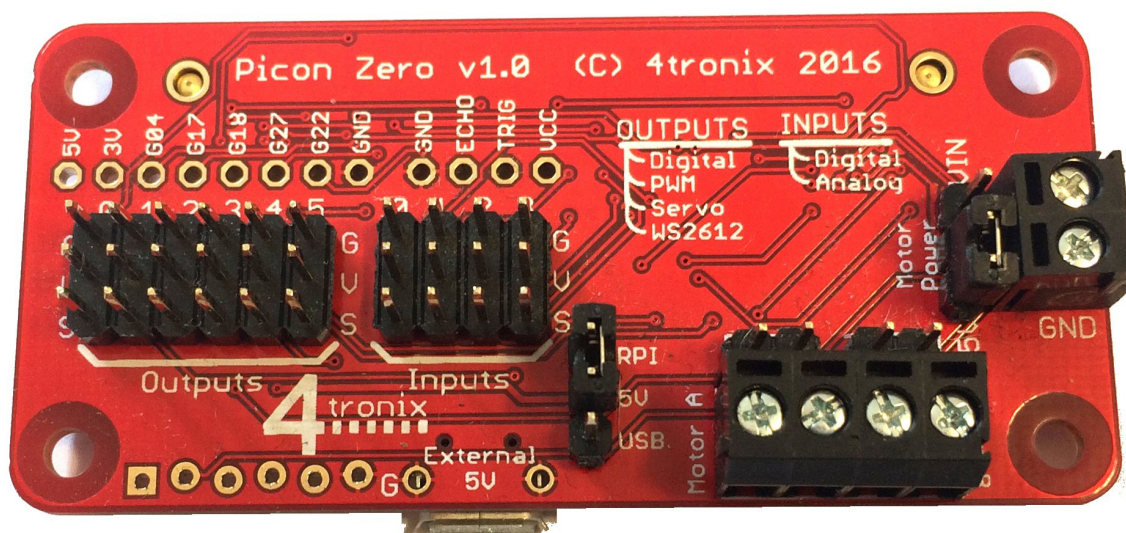
Decide on Power required for Motors:

1. Small motors – eg. Micro metal-gearred motors can be run (with limitations) off the same 5V from the Raspberry Pi
2. Motors requiring more current (>100mA) or more voltage (>5V) should be used with an external power supply separate from the 5V for the Raspberry Pi
3. If 5V is the correct voltage for the motors, but more current is required, then a third option is to provide 5V directly to the Picon Zero via the micro-USB connector

Option 1 – Use same 5V as the Raspberry Pi

Jumper settings as shown below:

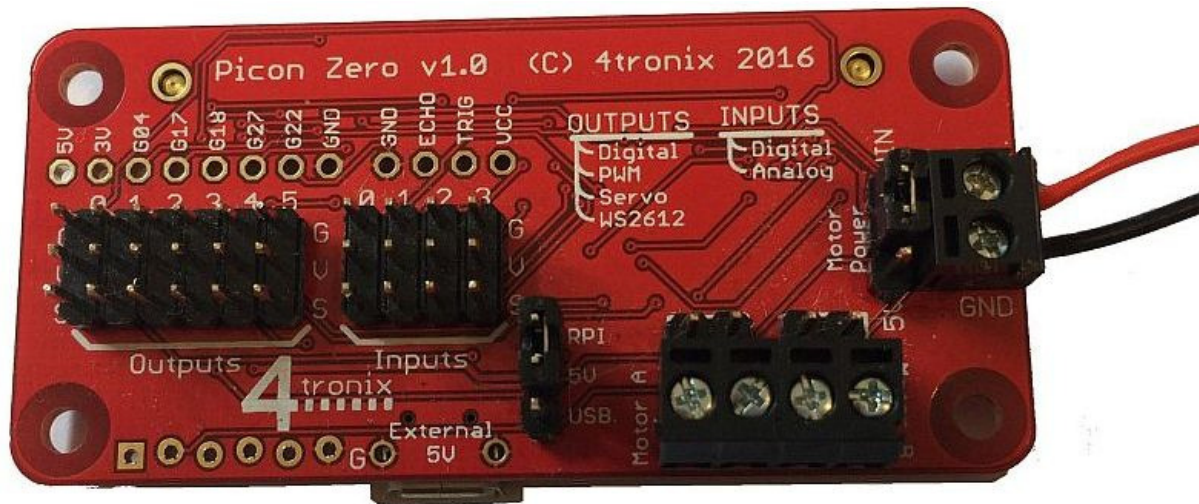
- 5V jumper set to RPI
- Motor Power jumper set to 5V



Option 2 – Use External Motor Power

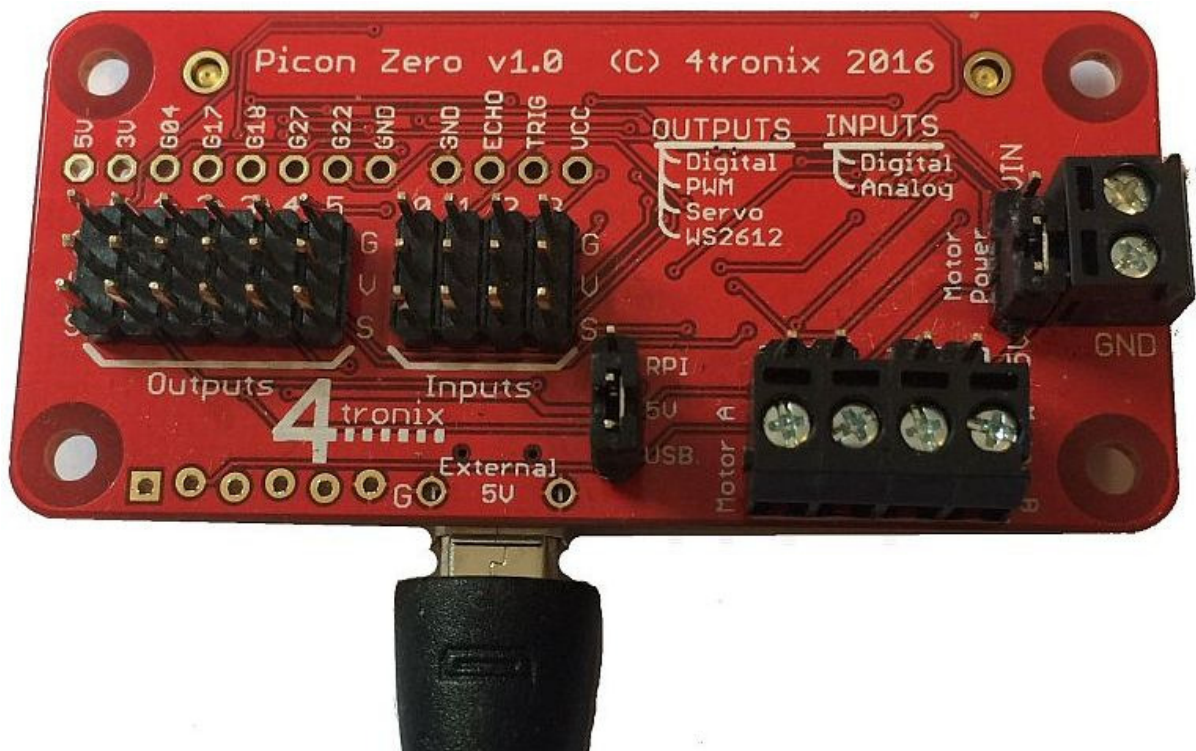
Jumper settings as shown below:

- 5V jumper set to (not relevant)
- Motor Power jumper set to Vin

**Option 3 – Use External 5V Power**

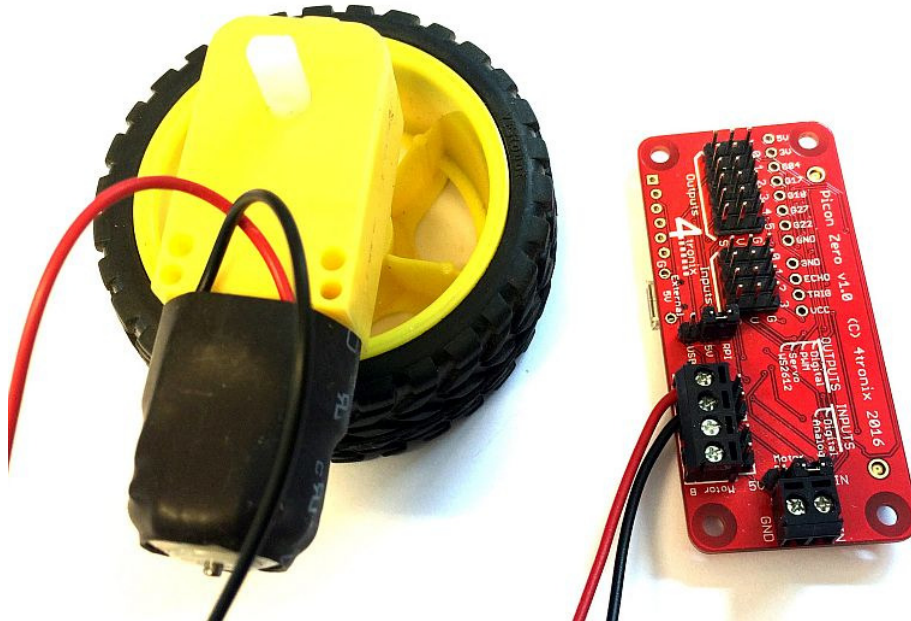
Jumper settings as shown below:

- 5V jumper set to USB
- Motor Power jumper set to 5V

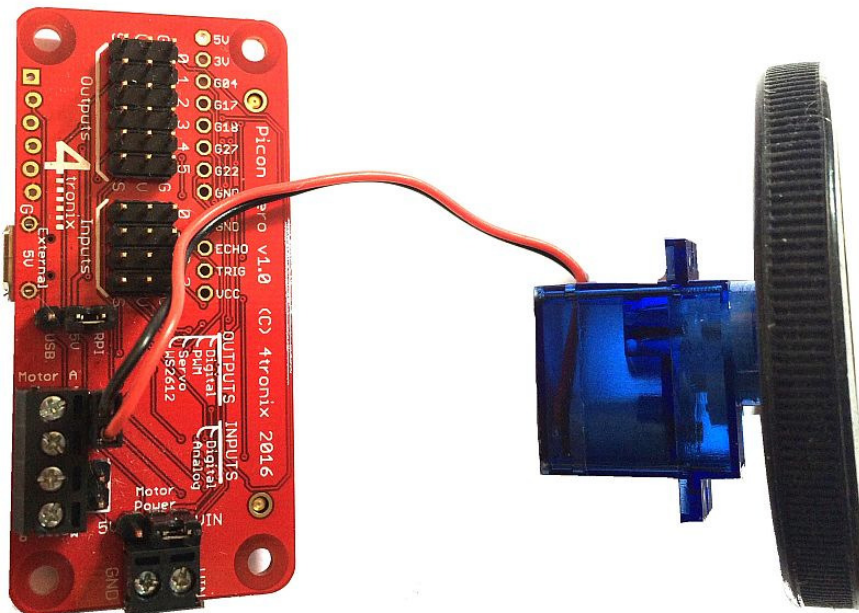


Connect the Motor(s)

If you have motors with bare-ended wires then connect them to the screw terminals

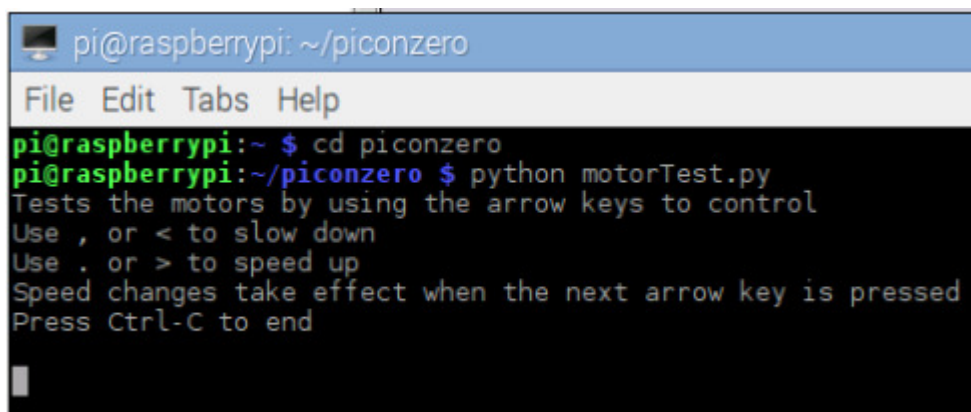


If you have a 2-pin female plug, then connect them to the 2-pin headers just behind the screw terminals



Testing the Motor(s)

- Power up the Raspberry Pi
- Ensure power is connected to the motors (for options 2 or 3)
- Change to the piconzero folder
`cd piconzero`
- Run the motor test software
`python motorTest.py`
- Use the arrow keys on your keyboard to move the motors:
 - both forward
 - both backward
 - left forward and right backward (spin right)
 - left backward and right forward (spin left)
- Use the Space key to stop
- Exit the program by pressing <Ctrl-C>



```
pi@raspberrypi: ~/piconzero
File Edit Tabs Help
pi@raspberrypi:~ $ cd piconzero
pi@raspberrypi:~/piconzero $ python motorTest.py
Tests the motors by using the arrow keys to control
Use , or < to slow down
Use . or > to speed up
Speed changes take effect when the next arrow key is pressed
Press Ctrl-C to end
```

Trouble Shooting

- The motors won't start until an arrow key is pressed
- The speed won't change when the . or , is pressed. It will change at the next arrow key
- If the motors turn the wrong way, then swap the wires at the connector until forward is forward, for both motors
- If the motors do not turn at all, check that you have the jumpers set correctly for your power method
- If the Raspberry Pi resets (or you lose WiFi or Bluetooth connection) then your motors are using too much power from the Raspberry Pi and you will need to use power option 2 or 3