Setting Up PS4 Controller with Linux Raspbian

Kevin J. Walchko

Abstract

This will show you how to setup a bluetooth PS4 controller on a Raspberry Pi with Linux Raspbian. You won't have access to *everything*, like the accels and gyros, but you will have all of the buttons and analog sticks. Then using python and SDL2, I can easily interface with joystick.

PS4 Controller

Figure 1: Sony PS4 Dual Shock Controller

Setup Bluetooth and Pairing

Log into your Raspberry Pi either via SSH or using a keyboard, at the console:

```
sudo systemctl enable bluetooth.service
sudo systemctl start bluetooth.service
```

Pairing using `bluetoothctl`:

```
sudo bluetoothctl
```

Some of the commands available:

```
[bluetooth]$ help
Available commands:
  list                       List available controllers
  show [ctrl]                Controller information
  select <ctrl>              Select default controller
  devices                    List available devices
  paired-devices             List paired devices
  power <on/off>             Set controller power
  pairable <on/off>          Set controller pairable mode
  discoverable <on/off>      Set controller discoverable mode
  agent <on/off/capability>  Enable/disable agent with given capability
  default-agent              Set agent as the default one
  scan <on/off>              Scan for devices
  info <dev>                 Device information
  pair <dev>                 Pair with device
  trust <dev>                Trust device
  untrust <dev>              Untrust device
  block <dev>                Block device
  unblock <dev>              Unblock device
  remove <dev>               Remove device
  connect <dev>              Connect device
  disconnect <dev>           Disconnect device
  version                    Display version
  quit                       Quit program
```

At the `bluetoothctl` prompt type the following commands:

```
agent on
default-agent
power on
discoverable on
pairable on
scan on
```

Example output can be found below:

```
[pi@pes ~]$ bluetoothctl
[NEW] Controller 00:15:XX:XX:XX:XX pes [default]
[bluetooth]# agent on
Agent registered
[bluetooth]# default-agent
Default agent request successful
[bluetooth]# power on
Changing power on succeeded
[bluetooth]# discoverable on
Changing discoverable on succeeded
[CHG] Controller 00:15:XX:XX:XX:XX Discoverable: yes
[bluetooth]# pairable on
Changing pairable on succeeded
[bluetooth]# scan on
Discovery started
```

Now put your Sony PlayStation 4 control pad into pairable mode by holding down the Share and PlayStation buttons until the light bar on the control pad flashes yellow. After a few seconds you should see at the `bluetoothctl` prompt that your control pad has been discovered, e.g.:

```
[bluetooth]# scan on
```

```
Discovery started
[CHG] Controller 00:15:XX:XX:XX:XX Discovering: yes
[NEW] Device 00:3C:XX:XX:XX:XX 00-3C-XX-XX-XX-XX
[NEW] Device 1C:66:XX:XX:XX:XX 1C-66-XX-XX-XX-XX
[CHG] Device 1C:66:XX:XX:XX:XX LegacyPairing: no
[CHG] Device 1C:66:XX:XX:XX:XX Name: Wireless Controller
[CHG] Device 1C:66:XX:XX:XX:XX Alias: Wireless Controller
[CHG] Device 1C:66:XX:XX:XX:XX LegacyPairing: yes
[CHG] Device 1C:66:XX:XX:XX:XX Class: 0x002508
[CHG] Device 1C:66:XX:XX:XX:XX Icon: input-gaming
```

Take a note of the Bluetooth MAC address shown for "Wireless Controller", e.g. 1C:66:XX:XX:XX:XX in my case.

Now type:

```
pair MAC
```

where MAC is the MAC address of your controller. If asked, enter 0000 as the PIN, for example:

```
[bluetooth]# pair 1C:66:XX:XX:XX:XX
Attempting to pair with 1C:66:XX:XX:XX:XX
[CHG] Device 1C:66:XX:XX:XX:XX Connected: yes
Request PIN code
[agent] Enter PIN code: 0000
[CHG] Device 1C:66:XX:XX:XX:XX Modalias: usb:v054Cp05C4d0100
[CHG] Device 1C:66:XX:XX:XX:XX UUIDs: 00001124-0000-1000-8000-00805f9b34fb
[CHG] Device 1C:66:XX:XX:XX:XX UUIDs: 00001200-0000-1000-8000-00805f9b34fb
[CHG] Device 1C:66:XX:XX:XX:XX Paired: yes
Pairing successful
[CHG] Device 1C:66:XX:XX:XX:XX Connected: no
```

I believe the PIN is only required on the older PS3 controllers and not the newer PS4 ones. Next we must trust the controller by running:

```
trust MAC
```

where MAC is the MAC address of your control pad, for example:

```
[bluetooth]# trust 1C:66:XX:XX:XX:XX
[CHG] Device 1C:66:XX:XX:XX:XX Trusted: yes
Changing 1C:66:XX:XX:XX:XX trust succeeded
```

Finally, run the following command to connect to the controller:

```
[bluetooth]# connect 1C:66:XX:XX:XX:XX
Attempting to connect to 1C:66:XX:XX:XX:XX
[CHG] Device 1C:66:XX:XX:XX:XX Connected: yes
Connection successful
```

Then type `quit` to exit back to the command prompt. You should now see that the light bar on your control pad is blue.

Other useful info:

```
[bluetooth]# info 1C:66:xx:xx:xx:xx
Device 1C:66:xx:xx:xx:xx
    Name: Wireless Controller
    Alias: Wireless Controller
    Class: 0x002508
    Icon: input-gaming
```

```
        Paired: yes
        Trusted: yes
        Blocked: no
        Connected: yes
        LegacyPairing: no
        UUID: Human Interface Device... (00001124-0000-1000-8000-00805f9b34fb)
        UUID: PnP Information           (00001200-0000-1000-8000-00805f9b34fb)
        Modalias: usb:v054Cp05C4d0100


    [bluetooth]# paired-devices
    Device 1C:66:xx:xx:xx:xx Wireless Controller


    [bluetooth]# connect 1C:66:xx:xx:xx:xx
    Attempting to connect to 1C:66:xx:xx:xx:xx
    Connection successful


    [bluetooth]# disconnect 1C:66:6D:76:9B:B4
    Attempting to disconnect from 1C:66:xx:xx:xx:xx
    Successful disconnected
    [CHG] Device 1C:66:xx:xx:xx:xx Connected: no
```

Reconnect after reboot

1. put PS4 controller into pairable mode (press PS button and Share), the front light bar will flash.
2. run `bluetoothctl`
    1. connect 1C:66:6D:76:9B:B4

Debug

When paired, you should see strange characters appear when you use the joystick:

```
cat /dev/input/js0
```

This is because you are reading the raw digital joystick info and the command line is trying to convert that to printable characters for you. If you want something a little more useful, you can use `jstest` from the joystick package to see more meaningful info:

```
sudo apt-get install joystick
jstest /dev/input/js0
```

ds4drv

Early on, I had to install this. It did a great job, but recent kernels and the newer Debian Stretch (which Raspbian is based on), doesn't seem to need it. However, it did give me access to the accelerometer and gyros, but I generally don't need them.

So do `pip install ds4drv` (you need version 0.5.1 to work on jessie/rpi3) and it will go through and pair your device. Also follow the instructions on ds4drv to setup udev right. Then run:

`ds4drv`

This will pair and setup your joystick to work (I use SDL2 as my joystick interface) and it work great.

Also note, the light bar in the front should be strong, bright blue when paired.

References

- Bluetooth PS4 reference
- PS4 wiki
- http://eleccelerator.com/wiki/index.php?title=DualShock_4
- ds4drv