

How to change USB device permission permanently on Linux

Author : Dan Nanni

Categories : [Hardware](#)

Tagged as : [permission](#), [udevusb](#)

Question: I am trying to run `gpsd` on my Linux with a USB GPS receiver. However, I am getting the following errors from `gpsd`.

```
gpsd[377]: gpsd:ERROR: read-only device open failed: Permission denied
gpsd[377]: gpsd:ERROR: /dev/ttyUSB0: device activation failed.
gpsd[377]: gpsd:ERROR: device open failed: Permission denied - retrying read-only
```

Looks like `gpsd` does not have permission to access the USB device (`/dev/ttyUSB0`). How can I change its default permission mode permanently on Linux?

When you run a process that wants to read or write to a USB device, the user/group of the process must have appropriate permission to do so. Of course you can change the permission of your USB device manually with `chmod` command, but such manual permission change will be temporary. The USB device will revert to its default permission mode when you reboot your Linux machine.

```
pi@raspberrypi ~ $
pi@raspberrypi ~ $ ls -al /dev/ttyUSB0
crw-rw---T 1 root dialout 188, 0 Dec 31 1969 /dev/ttyUSB0
pi@raspberrypi ~ $
pi@raspberrypi ~ $
```

As a permanent solution, you can create a `udev`-based USB permission rule which assigns any custom permission mode of your choice. Here is how to do it.

First, you need to identify the vendorID and productID of your USB device. For that, use `lsusb` command.


```
$ lsusb -vvv
```

Ask Xmodulo

Find answers to commonly asked Linux questions

<http://ask.xmodulo.com>

```
Bus 001 Device 005: ID 067b:2303 Prolific Technology, Inc. PL2303 Serial Port
Couldn't open device, some information will be missing
Device Descriptor:
  bLength                18
  bDescriptorType        1
  bcdUSB                 1.10
  bDeviceClass           0 (Defined at Interface level)
  bDeviceSubClass        0
  bDeviceProtocol        0
  bMaxPacketSize0       64
  idVendor               0x067b Prolific Technology, Inc.
  idProduct              0x2303 PL2303 Serial Port
  bcdDevice              4.00
  iManufacturer          1
  iProduct               2
  iSerial                0
  bNumConfigurations     1
Configuration Descriptor:
  bLength                9
  bDescriptorType        2
  wTotalLength           39
```



From the `lsusb` output, find your USB device's entry, and look for "idVendor" and "idProduct" fields. In this example, we have idVendor (0x067b) and idProduct (0x2303).

Next, create a new `udev` rule as follows.

```
$ sudo vi /etc/udev/rules.d/50-myusb.rules
```

```
SUBSYSTEMS=="usb", ATTRS{idVendor}=="067b", ATTRS{idProduct}=="2303", GROUP="
users", MODE="0666"
```

Replace "idVendor" and "idProduct" values with your own. **MODE="0666"** indicates the preferred permission of the USB device.

Now reboot your machine or reload `udev` rules:

```
$ sudo udevadm control --reload
```

Then verify the permission of the USB device.

Ask Xmodulo

Find answers to commonly asked Linux questions

<http://ask.xmodulo.com>

```
pi@raspberrypi ~ $  
pi@raspberrypi ~ $ ls -al /dev/ttyUSB0  
crw-rw-rwT 1 root dialout 188, 0 Sep  4 22:55 /dev/ttyUSB0  
pi@raspberrypi ~ $  
pi@raspberrypi ~ $
```