

Bind device ID

When the robot uses two or more USB serial devices, the corresponding relationship between the device name and the device is not fixed, but is assigned in sequence according to the order in which the devices are connected to the system.

Inserting one device first and then another device can determine the relationship between the device and the device name, but it is very troublesome to plug and unplug the device every time the system starts. The serial port can be mapped to a fixed device name. Regardless of the insertion order, the device will be mapped to a new device name. We only need to use the new device name to read and write the device.

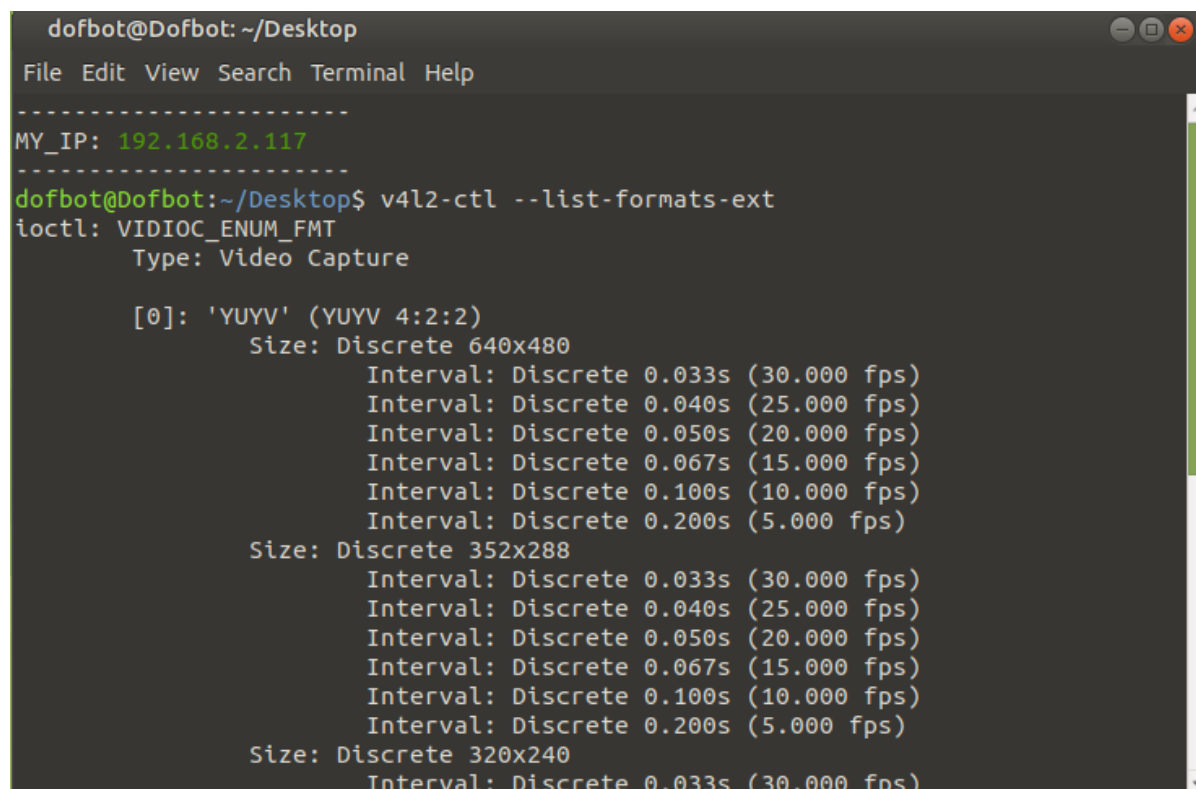
Note: If you use the virtual machine provided by Yahboom, the following steps can be omitted

1.Device view command

View camera device parameters

Input the following command in the terminal to view the corresponding relationship between the camera's pixel size and frame rate.

```
v4l2-ctl --list-formats-ext
```

A terminal window titled 'dofbot@Dofbot: ~/Desktop' with a menu bar (File, Edit, View, Search, Terminal, Help). The terminal shows the command 'v4l2-ctl --list-formats-ext' and its output. The output lists video capture formats for a device, including 'YUYV 4:2:2' with various discrete sizes (640x480, 352x288, 320x240) and frame rates (30.000, 25.000, 20.000, 15.000, 10.000, 5.000 fps).

```
dofbot@Dofbot: ~/Desktop
File Edit View Search Terminal Help
-----
MY_IP: 192.168.2.117
-----
dofbot@Dofbot:~/Desktop$ v4l2-ctl --list-formats-ext
ioctl: VIDIOC_ENUM_FMT
Type: Video Capture

[0]: 'YUYV' (YUYV 4:2:2)
      Size: Discrete 640x480
            Interval: Discrete 0.033s (30.000 fps)
            Interval: Discrete 0.040s (25.000 fps)
            Interval: Discrete 0.050s (20.000 fps)
            Interval: Discrete 0.067s (15.000 fps)
            Interval: Discrete 0.100s (10.000 fps)
            Interval: Discrete 0.200s (5.000 fps)
      Size: Discrete 352x288
            Interval: Discrete 0.033s (30.000 fps)
            Interval: Discrete 0.040s (25.000 fps)
            Interval: Discrete 0.050s (20.000 fps)
            Interval: Discrete 0.067s (15.000 fps)
            Interval: Discrete 0.100s (10.000 fps)
            Interval: Discrete 0.200s (5.000 fps)
      Size: Discrete 320x240
            Interval: Discrete 0.033s (30.000 fps)
```

Input the following command to view the device ID

```
lsusb
```

As can be seen from the figure below, each device has a corresponding ID number.

```
dofbot@dofbot:~/Desktop$ lsusb
Bus 002 Device 001: ID 1d6b:0003 Linux Foundation 3.0 root hub
Bus 001 Device 011: ID 1a86:7523 QinHeng Electronics HL-340 USB-Serial adapter
Bus 001 Device 010: ID 0483:5750 STMicroelectronics LED badge -- mini LED display -- 11x44
Bus 001 Device 008: ID 0c45:6340 Microdia Camera
Bus 001 Device 002: ID 2109:3431 VIA Labs, Inc. Hub
Bus 001 Device 001: ID 1d6b:0002 Linux Foundation 2.0 root hub
dofbot@dofbot:~/Desktop$
```

Serial data cable

USB camera

Input the following command to view the device number.

```
11 /dev/
```

```
crw-rw-rw- 1 root root 3, 91 1月 10 2022 ttyu0
crw-rw-rw- 1 root root 3, 92 1月 10 2022 ttyuc
crw-rw-rw- 1 root root 3, 93 1月 10 2022 ttyud
crw-rw-rw- 1 root root 3, 94 1月 10 2022 ttyue
crw-rw-rw- 1 root root 3, 95 1月 10 2022 ttyuf
crw-rw-rw- 1 root dialout 188, 0 10月 24 18:57 ttyUSB0
crw-rw-rw- 1 root root 3, 96 1月 10 2022 ttyv0
crw-rw-rw- 1 root root 3, 97 1月 10 2022 ttyv1
crw-rw-rw- 1 root root 3, 98 1月 10 2022 ttyv2
crw-rw-rw- 1 root root 3, 99 1月 10 2022 ttyv3
crw-rw-rw- 1 root root 3, 100 1月 10 2022 ttyv4
crw-rw-rw- 1 root root 3, 101 1月 10 2022 ttyv5
drwxr-xr-x 2 root root 60 1月 10 2022 vfio/
crw-rw-rw- 1 root root 10, 137 1月 10 2022 vhci
crw-rw-rw- 1 root root 10, 238 1月 10 2022 vhost-net
crw-rw-rw- 1 root root 10, 241 1月 10 2022 vhost-vsock
crw-rw-rw- 1 root video 81, 7 10月 24 18:55 video0
crw-rw-rw- 1 root video 81, 8 10月 24 18:55 video1
crw-rw-rw- 1 root video 81, 4 1月 10 2022 video10
crw-rw-rw- 1 root video 81, 5 1月 10 2022 video11
crw-rw-rw- 1 root video 81, 6 1月 10 2022 video12
crw-rw-rw- 1 root video 81, 0 1月 10 2022 video13
crw-rw-rw- 1 root video 81, 1 1月 10 2022 video14
crw-rw-rw- 1 root video 81, 2 1月 10 2022 video15
crw-rw-rw- 1 root video 81, 3 1月 10 2022 video16
crw-rw-rw- 1 root root 10, 130 1月 10 2022 watchdog
crw-rw-rw- 1 root root 243, 0 1月 10 2022 watchdog0
```

Serial port

Camera

2.Establish port mapping relationship

Bind serial device

You can see the USB device information corresponding to the dofbot control board through lsusb (the device ID information we are mainly concerned about is 1a86:7523)

```
Bus 003 Device 007: ID 1a86:7523 QinHeng Electronics HL-340 USB-Serial adapter
```

Edit myserial.rules file

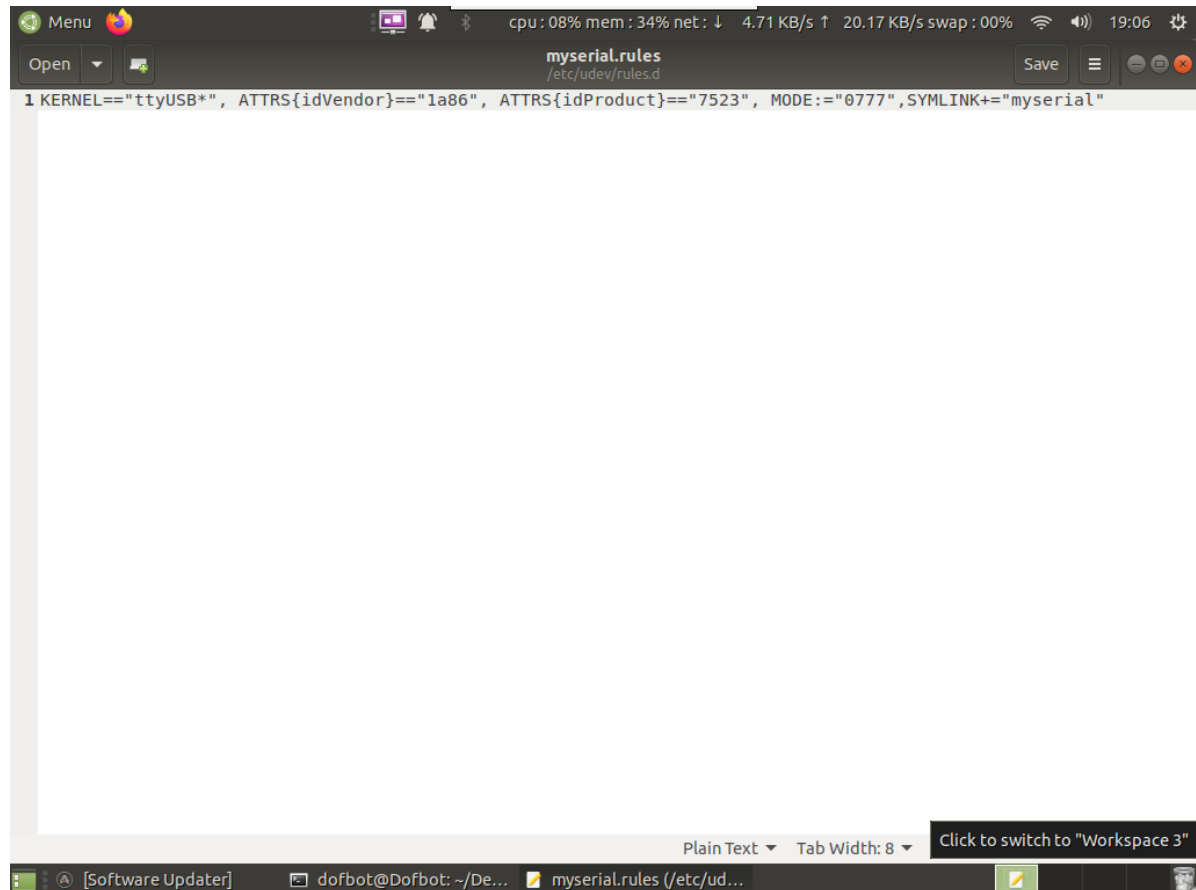
```
sudo gedit /etc/udev/rules.d/myserial.rules
```

The dofbot control board serial device ID information 1a86:7523 is required here. The following is the content of the myserial.rules file.

```
KERNEL=="ttyUSB*", ATTRS{idVendor}=="1a86", ATTRS{idProduct}=="7523",  
MODE:="0777", SYMLINK+="myserial"
```

Note: Some people often fail to bind in this step.

It is recommended to directly open the .md file we provide and copy it. Do not directly copy the content of the pdf file, otherwise the binding may not be successful.



Save the file and exit, then enter the following command to give myserial.rules execution permissions.

```
sudo chmod a+x /etc/udev/rules.d/myserial.rules
```

Enter the following three commands to replug the micro usb device.

```
sudo udevadm trigger  
sudo service udev reload  
sudo service udev restart
```

Enter the following command to check whether the device number is successfully bound.

```
ll /dev/myserial
```

When the picture shown below appears, it is considered to be successfully bound.

```
dofbot@dofbot:~/Desktop$ sudo chmod a+x /etc/udev/rules.d/myserial.rules
dofbot@dofbot:~/Desktop$ sudo udevadm trigger
dofbot@dofbot:~/Desktop$ sudo service udev reload
dofbot@dofbot:~/Desktop$ sudo service udev restart
dofbot@dofbot:~/Desktop$ ll /dev/myserial
lrwxrwxrwx 1 root root 7 10月 24 19:07 /dev/myserial -> ttyUSB0
dofbot@dofbot:~/Desktop$
```