Update CH340 driver on Raspberry Pi

Introduction

The CH340 driver in the Linux kernel-based system such as Raspberry Pi is too old. It has compatibility issues with the new CH340G chip. You need to install the new driver manually.

The Linux driver source code download url is here:
download

Hardware and operating system

Raspberry Pi 4B, Broadcom BCM711, 4GB Ram, install the official Raspberry Pi system released on May 7th 2021. The kernel version is 5.10.

Raspberry Pi OS with desktop and recommended software

Release date: May 7th 2021
Kernel version: 5.10
Size: 2,867MB
Show SHA256 file integrity hash:
Release notes

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1. Delete the original driver

Input the command to find the serial device driver installed in the system.

```
ls /lib/modules/(version)/kernel/drivers/usb/serial/
```

```
pi@raspberrypi:/ $ ls /lib/modules/5.10.60-v7l+/kernel/drivers/usb/serial/
aircable.ko    cypress_m8.ko       io_edgeport.ko  keyspan.ko      mos7720.ko  oti6858.ko      sierra.ko           usbserial.ko
ark3116.ko     digi_acceleport.ko  io_ti.ko        keyspan_pda.ko  mos7840.ko  p12303.ko       spcp8x5.ko          usb_wwan.ko
belkin_sa.ko   empeg.ko            ipaq.ko         kl5kusb105.ko   navman.ko   qcaux.ko        ssu100.ko           visor.ko
ch341.ko       f81232.ko           ipw.ko          kobil_sct.ko    omninet.ko  qcserial.ko     symbolserial.ko     whiteheat.ko
cp210x.ko      ftdi_sio.ko         ir-usb.ko       mct_u232.ko     opticon.ko  quatech2.ko     ti_usb_3410_5052.ko wishbone-serial.ko
cyberjack.ko   garmin_gps.ko       iuu_phoenix.ko  metro-usb.ko    option.ko   safe_serial.ko  usb_debug.ko        xsens_mt.ko
```

Find ch341.ko and delete.

```
sudo rm /lib/modules/(version)/kernel/drivers/usb/serial/ch341.ko
```

```
pi@raspberrypi:/ $ sudo rm /lib/modules/5.10.60-v7l+/kernel/drivers/usb/serial/ch341.ko
```

2. Compile and install the new driver

Download the CH340 driver source code and unzip it.

```
unzip CH341SER_LINUX.ZIP
```

```
pi@raspberrypi:~ $ unzip CH341SER_LINUX.ZIP
Archive:  CH341SER_LINUX.ZIP
   creating: CH341SER_LINUX/
  inflating: CH341SER_LINUX/ch34x.c
  inflating: CH341SER_LINUX/Makefile
  inflating: CH341SER_LINUX/readme.txt
```

Enter the source directory and compile.

```
cd CH341SER_LINUX &&  make
```

```
pi@raspberrypi:~/CH341SER_LINUX $ make
make -C /lib/modules/5.10.60-v7l+/build  M=/home/pi/CH341SER_LINUX
make[1]: *** /lib/modules/5.10.60-v7l+/build: No such file or directory.  Stop.
make: *** [Makefile:5: default] Error 2
```

If the kernel header file is not installed in the system, the compiler will prompt an error, /lib/modules/(version)/build not found.
Install Raspberry Pi kernel header files.

```
sudo apt install raspberrypi-kernel-headers
```

```
pi@raspberrypi:~/CH341SER_LINUX $ sudo apt install raspberrypi-kernel-headers
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  raspberrypi-kernel-headers
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 0 B/27.7 MB of archives.
After this operation, 180 MB of additional disk space will be used.
Selecting previously unselected package raspberrypi-kernel-headers.
(Reading database ... 171098 files and directories currently installed.)
Preparing to unpack .../raspberrypi-kernel-headers_1%3a1.20210831-3~buster_armhf.deb ...
Unpacking raspberrypi-kernel-headers (1:1.20210831-3~buster) ...
Setting up raspberrypi-kernel-headers (1:1.20210831-3~buster) ...
```

Recompile after installing the kernel header files. If the compiler prompts an unknown error of type'wait-queue+t', please use vi to open the ch34x.c file, find and comment out line 591.

```
pi@raspberrypi:~/CH341SER_LINUX $ make
make -C /lib/modules/5.10.60-v7l+/build  M=/home/pi/CH341SER_LINUX
make[1]: Entering directory '/usr/src/linux-headers-5.10.60-v7l+'
  CC [M]  /home/pi/CH341SER_LINUX/ch34x.o
/home/pi/CH341SER_LINUX/ch34x.c: In function 'ch34x_close':
/home/pi/CH341SER_LINUX/ch34x.c:591:2: error: unknown type name 'wait_queue_t'; did you mean 'wait_event'?
  wait_queue_t wait;
  ^~~~~~~~~~~~
  wait_event
/home/pi/CH341SER_LINUX/ch34x.c:591:15: warning: unused variable 'wait' [-Wunused-variable]
  wait_queue_t wait;
               ^~~~
/home/pi/CH341SER_LINUX/ch34x.c:590:7: warning: unused variable 'timeout' [-Wunused-variable]
  long timeout;
       ^~~~~~~
/home/pi/CH341SER_LINUX/ch34x.c:589:6: warning: unused variable 'bps' [-Wunused-variable]
  int bps;
      ^~~
make[2]: *** [scripts/Makefile.build:280: /home/pi/CH341SER_LINUX/ch34x.o] Error 1
make[1]: *** [Makefile:1825: /home/pi/CH341SER_LINUX] Error 2
make[1]: Leaving directory '/usr/src/linux-headers-5.10.60-v7l+'
make: *** [Makefile:5: default] Error 2
```

After successful compilation, the ch34x.ko file will be generated.

```
pi@raspberrypi:~/CH341SER_LINUX $ ls
ch34x.c  ch34x.ko  ch34x.mod  ch34x.mod.c  ch34x.mod.o  ch34x.o  Makefile  modules.order  Module.symvers  readme.txt
```

Copy the ch34x.ko file to the kernel driver directory, and install the driver.

```
sudo cp ch34x.ko /lib/modules/(version)/kernel/drivers/usb/serial/
```

```
sudo depmod
```

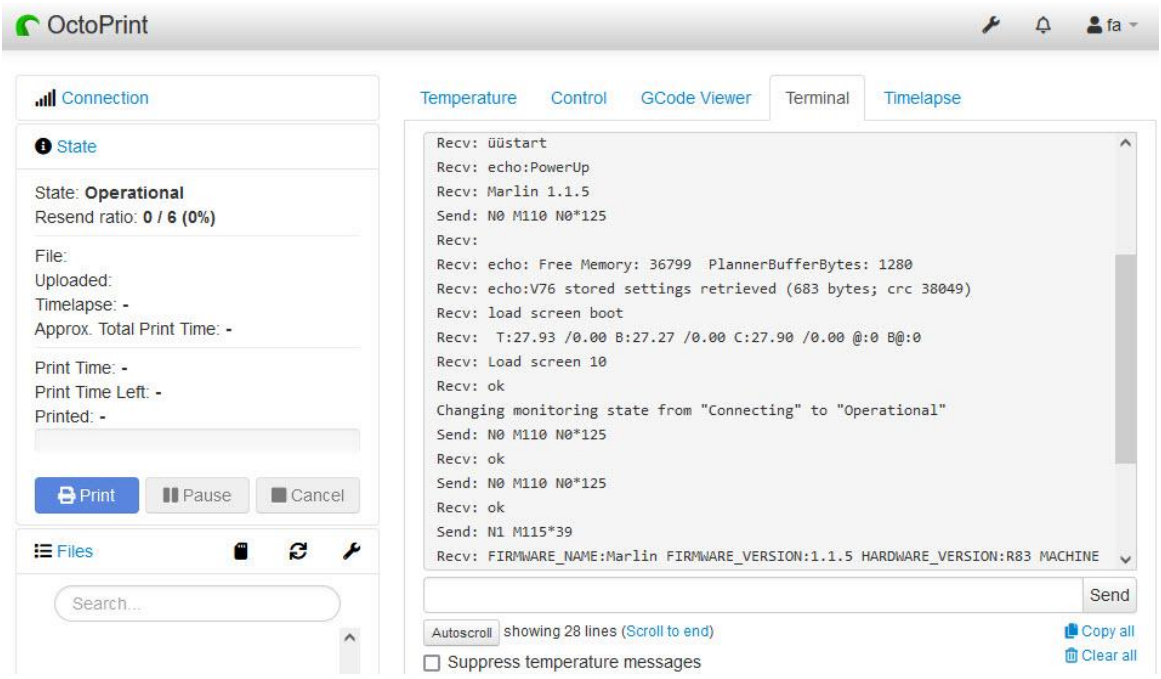
```
pi@raspberrypi:~/CH341SER_LINUX $ sudo cp ch34x.ko /lib/modules/5.10.60-v7l+/kernel/drivers/usb/serial/
pi@raspberrypi:~/CH341SER_LINUX $ sudo depmod
```

3. Test the serial connection

Connect the 3D printer with a USB cable and turn on the power. If the driver is successfully installed, the ttyUSB0 device will appear in the /dev/ directory.

```
pi@raspberrypi:~ $ ls /dev
autofs          gpiochip1   loop-control  ram0   ram9          stdout  tty20  tty34  tty48  tty61      vcio     vcsa5       video11
block           gpiomem     mapper        ram1   random        tty     tty21  tty35  tty49  tty62      vc-mem   vcsa6       video12
btrfs-control   hwrng       media0        ram10  raw           tty0    tty22  tty36  tty5   tty63      vcs      vcsa7       video13
bus             initctl     media1        ram11  rfkill        tty1    tty23  tty37  tty50  tty7       vcs1     vcsm-cma    video14
cachefiles      input       mem           ram12  rpivid-h264mem tty10  tty24  tty38  tty51  tty8       vcs2     vcsu        video15
char            kmsg        mmcblk0       ram13  rpivid-hevcmem tty11  tty25  tty39  tty52  tty9       vcs3     vcsu1       video16
console         log         mmcblk0p1     ram14  rpivid-intcmem tty12  tty26  tty4   tty53  ttyAMA0    vcs4     vcsu2       watchdog
cuse            loop0       mmcblk0p2     ram15  rpivid-vp9mem  tty13  tty27  tty40  tty54  ttyprintk  vcs5     vcsu3       watchdog0
disk            loop1       mqueue        ram2   serial        tty14  tty28  tty41  tty55  ttyS0      vcs6     vcsu4       zero
dma_heap        loop2       net           ram3   serial0       tty15  tty29  tty42  tty56  ttyUSB0    vcs7     vcsu5
dri             loop3       null          ram4   serial1       tty16  tty3   tty43  tty57  uhid       vcsa     vcsu6
fd              loop4       port          ram5   shm           tty17  tty30  tty44  tty58  uinput     vcsa1    vcsu7
full            loop5       ppp           ram6   snd           tty18  tty31  tty45  tty59  urandom    vcsa2    vga_arbiter
fuse            loop6       ptmx          ram7   stderr        tty19  tty32  tty46  tty6   v4l        vcsa3    vhci
gpiochip0       loop7       pts           ram8   stdin         tty2   tty33  tty47  tty60  vchiq      vcsa4    video10
```

Find the ttyUSB0 device in OctoPrint and set the baud rate to 115200.
Open the port and switch to the Terminal panel. The firmware version information of the 3D printer is displayed in the console, and the connection is successful.



OctoPi

If you are using OctoPi V0.18.0 or earlier system, you need to update the kernel first.

```
sudo apt-get update

sudo apt-get install raspberrypi-bootloader raspberrypi-kernel

sudo reboot
```

```
pi@octopi:~ $ sudo apt-get update
Hit:1 http://archive.raspberrypi.org/debian buster InRelease
Get:2 http://raspbian.raspberrypi.org/raspbian buster InRelease [15.0 kB]
Reading package lists... Done
E: Repository 'http://raspbian.raspberrypi.org/raspbian buster InRelease' changed its 'Suite' value from 'stable' to 'oldstable'
N: This must be accepted explicitly before updates for this repository can be applied. See apt-secure(8) manpage for details.
pi@octopi:~ $ sudo apt-get install raspberrypi-bootloader raspberrypi-kernel
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libraspberrypi-bin libraspberrypi-dev libraspberrypi-doc libraspberrypi0
The following packages will be upgraded:
  libraspberrypi-bin libraspberrypi-dev libraspberrypi-doc libraspberrypi0 raspberrypi-bootloader raspberrypi-kernel
6 upgraded, 0 newly installed, 0 to remove and 65 not upgraded.
Need to get 117 MB of archives.
After this operation, 2,572 kB disk space will be freed.
Do you want to continue? [Y/n] y
Get:1 http://archive.raspberrypi.org/debian buster/main armhf libraspberrypi-doc armhf 1:1.20211007-2~buster [31.4 MB]
Get:2 http://archive.raspberrypi.org/debian buster/main armhf libraspberrypi-dev armhf 1:1.20211007-2~buster [400 kB]
Get:3 http://archive.raspberrypi.org/debian buster/main armhf raspberrypi-kernel armhf 1:1.20211007-2~buster [79.8 MB]
Get:4 http://archive.raspberrypi.org/debian buster/main armhf libraspberrypi-bin armhf 1:1.20211007-2~buster [342 kB]
Get:5 http://archive.raspberrypi.org/debian buster/main armhf libraspberrypi0 armhf 1:1.20211007-2~buster [847 kB]
Get:6 http://archive.raspberrypi.org/debian buster/main armhf raspberrypi-bootloader armhf 1:1.20211007-2~buster [4,527 kB]
Fetched 117 MB in 11min 23s (172 kB/s)
Reading changelogs... Done
```

Reboot the system, check the kernel version, then install the Raspberry Pi kernel header files.

```
pi@octopi:~ $ uname -a
Linux octopi 5.10.63-v7l+ #1459 SMP Wed Oct 6 16:41:57 BST 2021 armv7l GNU/Linux
pi@octopi:~ $ sudo apt install raspberrypi-kernel-headers
```


```
pi@octopi:~ $ sudo apt-get update
Hit:1 http://archive.raspberrypi.org/debian buster InRelease
Get:2 http://raspbian.raspberrypi.org/raspbian buster InRelease [15.0 kB]
Reading package lists... Done
E: Repository 'http://raspbian.raspberrypi.org/raspbian buster InRelease' changed its 'Suite' value from 'stable' to 'oldstable'
N: This must be accepted explicitly before updates for this repository can be applied. See apt-secure(8) manpage for details.
pi@octopi:~ $ sudo apt-get install raspberrypi-bootloader raspberrypi-kernel
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  libraspberrypi-bin libraspberrypi-dev libraspberrypi-doc libraspberrypi0
The following packages will be upgraded:
  libraspberrypi-bin libraspberrypi-dev libraspberrypi-doc libraspberrypi0 raspberrypi-bootloader raspberrypi-kernel
6 upgraded, 0 newly installed, 0 to remove and 65 not upgraded.
Need to get 117 MB of archives.
After this operation, 2,572 kB disk space will be freed.
Do you want to continue? [Y/n] y
Get:1 http://archive.raspberrypi.org/debian buster/main armhf libraspberrypi-doc armhf 1:1.20211007-2~buster [31.4 MB]
Get:2 http://archive.raspberrypi.org/debian buster/main armhf libraspberrypi-dev armhf 1:1.20211007-2~buster [400 kB]
Get:3 http://archive.raspberrypi.org/debian buster/main armhf raspberrypi-kernel armhf 1:1.20211007-2~buster [79.8 MB]
Get:4 http://archive.raspberrypi.org/debian buster/main armhf libraspberrypi-bin armhf 1:1.20211007-2~buster [342 kB]
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Linux octopi 5.10.63-v7l+ #1459 SMP Wed Oct 6 16:41:57 BST 2021 armv7l GNU/Linux
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```