

Updating the Bootloader / Firmware of the XO-mini

The XO-mini runs on a **Raspberry Pi 4 Model B - 8GB** mainboard.

Its Firmware or Bootloader is stored on an eeprom on the Raspberry Pi hardware.

It cannot be updated with the XO-mini but needs a current Raspberry OS operating system to do so.

You also need an ethernet internet connection for downloading the latest updates.

First you should check your current bootloader version by disconnecting the internal SSD.

This is done by removing the double USB plug on the rear.

(It connects the internal XO-mini SSD with the mainboard.)



Now connect an HDMI screen and power and start up by briefly pressing the power button.
Make sure that no USB system drive is connected.

You should see a screen like this:

```
Raspberry Pi 4 - 4GB
bootloader: a5e1b95f Apr 27 2020

board: c03111 9ffefdef dc:a6:32:01:36:c2
boot: mode 6 order 0x00000001 rsts 0x00001002
SD CID: 00035344534c31364780dccc142d012c
part: 0 mbr [0x0c:00000800 0x00:00000000 0x00:00000000 0x00:00000000]
fw: start.elf fixup.dat
net: down ip: 0.0.0.0 sn: 0.0.0.0 gw: 0.0.0.0
tftp: 0.0.0.0
```

In the second line you will see "**bootloader: . . .**" followed by a **date**.

Write down this date to see later if the update was successful.

If it shows a date that is older than 2022/04/26 you should definitely update your bootloader.

Older bootloaders can cause malfunctions!

Updating the bootloader cannot be done while running the XO-mini operating system and software!

You need to download a Raspberry Pi OS operating system - as follows - to do so.

Update the bootloader / firmware:

STEP 1 - DOWNLOAD THE RASPBERRY PI OS

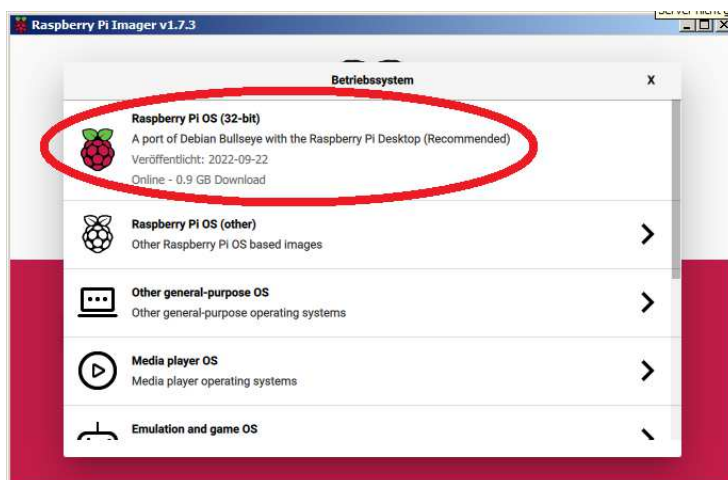
- a) Download the Raspberry Pi Imager software for your computer operating system here:
<https://www.raspberrypi.com/software/>
and install it on your computer.

- b) Run the **Raspberry Pi Imager** software.

The software should start automatically after installation.

If not go to your programs and look into the "Raspberry Pi" folder.

- c) Click on "**Choose OS**" on the left and choose **Raspberry Pi OS (32-bit)**.



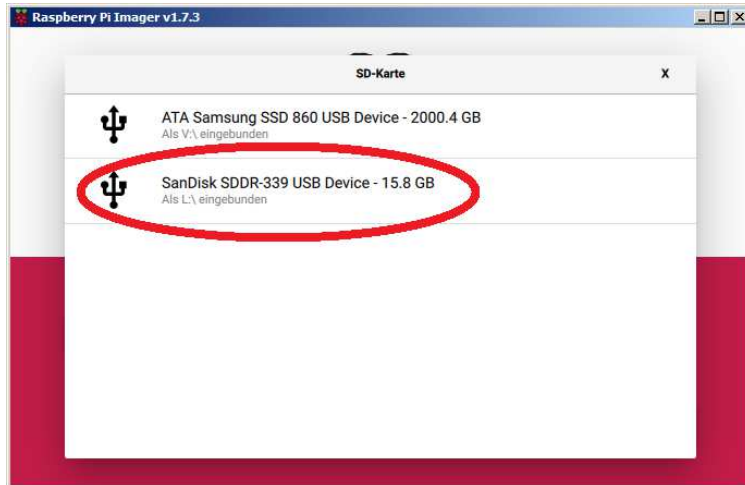
- d) Connect a USB drive of at least 8 GB. It's best to use a fast USB3 drive. Click "**CHOOSE SD CARD**".



- e) Select your USB drive.

MAKE SURE NOT (!) TO SELECT THE WRONG DRIVE HERE OR YOU WILL ERASE YOUR DRIVE !!!

To be on the safe side disconnect all other important USB drives beforehand to have only one choice!



- f) Now click "WRITE" and confirm with "YES".



- g) Your operating system will be downloaded and written directly to your USB drive.
This will take several minutes - depending on your internet speed . . .



- h) When your system drive is created you can remove it.
Press "CONTINUE" and remove the USB drive. Then plug it into your XO-mini.



You have finished **STEP 1** creating your Raspberry OS system drive!

STEP 2 - STARTING THE RASPBERRY OS FOR THE FIRST TIME

- a) Connect the new drive to your XO-mini with the internal SSD disconnected and start up.
The system will do a few operations like resizing the drive, etc. and restart automatically.

Then it will boot into the "**Welcome to the Raspberry Pi Desktop!**" screen and prompt you to click "**Next**".
- b) Set your country, language and keyboard (the latter only if you like to use English and a US keyboard).
Click **Next** and your location will be set up.
- c) Enter a username and password.

Since we are using this only for updating the bootloader you can use username **pi** and password **pi** .
Feel free to use anything different if you want to explore the system more than just for updating the bootloader.

If you use pi for both you will be warned a default name and password that is commonly known.
Confirm and continue.
- d) If your screen is not displaying correctly you can resize the screen **Set Up Screen** and click **Next**.
- e) **Select WiFi Network** lets you select a wireless network. You will need your **WiFi Password** to connect!
If you have an Ethernet cable with internet **Skip** this one, or else click **Next** to enter your **WiFi Password**.
- f) **Update Software** will automatically update your software. Click **Next** to do so.
Be prepared that this can take some time!
- g) When finished you will see "**System is up to date**". Click [ENTER].
Setup Complete press restart to boot into your new **Raspberry Pi OS** system!

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*Please note that if you have an older system drive you should update it first before going on.
Please run these commands in the terminal with internet connected:*

sudo apt update
sudo apt full-upgrade -y
sudo apt autoremove

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STEP 3 - Updating your MAINBOARD Bootloader

- a) The taskbar is most likely on the top edge of your screen.
Click onto this terminal icon to open a terminal.



- b) Type: **sudo rpi-eeprom-update** to see your current bootloader version and release type.

```
pi@raspberrypi: ~  
File Edit Tabs Help  
bash: warning: setlocale: LC_ALL: cannot change locale (de_DE.UTF-8)  
pi@raspberrypi:~$ sudo rpi-eeprom-update
```

+ [ENTER]

```
pi@raspberrypi: ~  
File Edit Tabs Help  
bash: warning: setlocale: LC_ALL: cannot change locale (de_DE.UTF-8)  
pi@raspberrypi:~$ sudo rpi-eeprom-update  
BOOTLOADER: up to date  
CURRENT: Tue Apr 26 10:24:28 UTC 2022 (1650968668)  
LATEST: Tue Apr 26 10:24:28 UTC 2022 (1650968668)  
RELEASE: default (/lib/firmware/raspberrypi/bootloader/default)  
Use raspi-config to change the release.  
  
VL805_FW: Using bootloader EEPROM  
VL805: up to date  
CURRENT: 000138a1  
LATEST: 000138a1  
pi@raspberrypi:~$
```

Please write down the **CURRENT** and **LATEST** dates as well as the **RELEASE** (default or stable).

*By typing **clear** and pressing [ENTER] you can clear your terminal window - if needed.*

- c) Type **sudo rpi-eeprom-update -d -a** followed by pressing [ENTER] to update the files on your system.
This needs your Internet to be working correctly!

```
pi@raspberrypi: ~  
File Edit Tabs Help  
root@raspberrypi:~# sudo rpi-eeprom-update -d -a
```

+ [ENTER]

```
pi@raspberrypi: ~  
File Edit Tabs Help  
root@raspberrypi:~# sudo rpi-eeprom-update -d -a  
BOOTLOADER: up to date  
CURRENT: Tue Apr 26 10:24:28 UTC 2022 (1650968668)  
LATEST: Tue Apr 26 10:24:28 UTC 2022 (1650968668)  
RELEASE: default (/lib/firmware/raspberrypi/bootloader/default)  
Use raspi-config to change the release.  
  
VL805_FW: Using bootloader EEPROM  
VL805: up to date  
CURRENT: 000138a1  
LATEST: 000138a1  
root@raspberrypi:~#
```

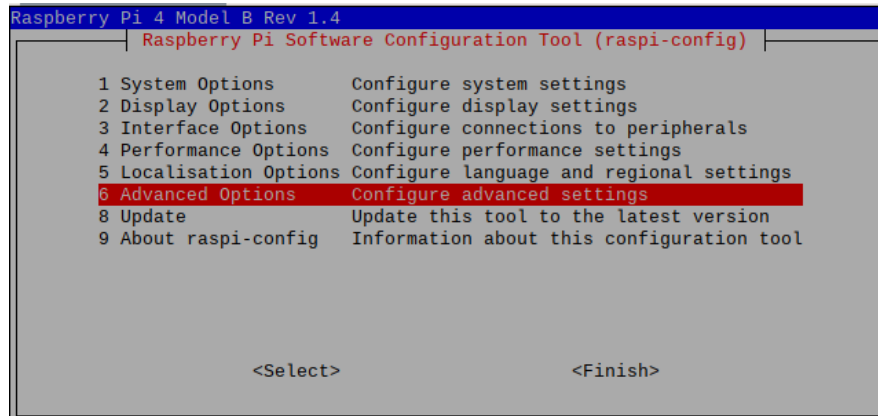
d) In the terminal type **sudo raspi-config** and [ENTER]



```
pi@raspberrypi: ~  
File Edit Tabs Help  
bash: warning: setlocale: LC_ALL: cannot change locale (de_DE.UTF-8)  
pi@raspberrypi: ~$ sudo raspi-config
```

+ [ENTER]

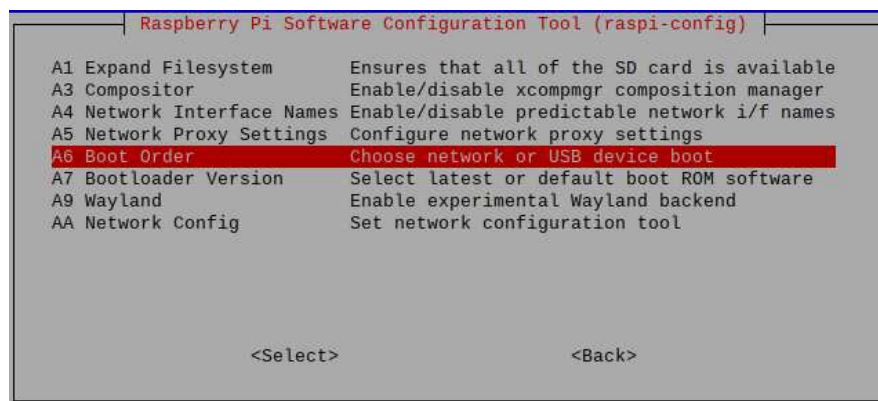
Use the arrow keys to navigate down to "**6 Advanced Options**" and press [ENTER].



```
Raspberry Pi 4 Model B Rev 1.4  
Raspberry Pi Software Configuration Tool (raspi-config)  
  
1 System Options      Configure system settings  
2 Display Options     Configure display settings  
3 Interface Options   Configure connections to peripherals  
4 Performance Options Configure performance settings  
5 Localisation Options Configure language and regional settings  
6 Advanced Options    Configure advanced settings  
8 Update              Update this tool to the latest version  
9 About raspi-config  Information about this configuration tool  
  
<Select>              <Finish>
```

+ [ENTER]

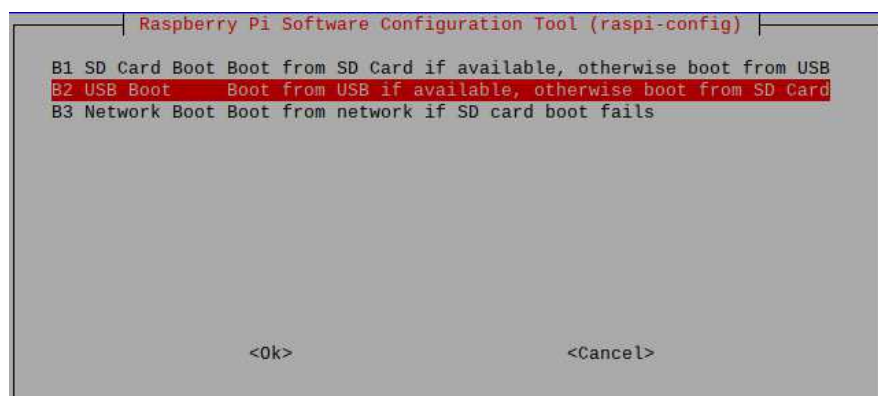
Now move down to "**A6 Boot Order**" and press [ENTER].



```
Raspberry Pi Software Configuration Tool (raspi-config)  
  
A1 Expand Filesystem  Ensures that all of the SD card is available  
A3 Compositor          Enable/disable xcompmgr composition manager  
A4 Network Interface Names Enable/disable predictable network i/f names  
A5 Network Proxy Settings Configure network proxy settings  
A6 Boot Order          Choose network or USB device boot  
A7 Bootloader Version  Select latest or default boot ROM software  
A9 Wayland             Enable experimental Wayland backend  
AA Network Config      Set network configuration tool  
  
<Select>              <Back>
```

+ [ENTER]

Select **B2 USB Boot** and press [ENTER] - it should confirm that "USB is default boot device".

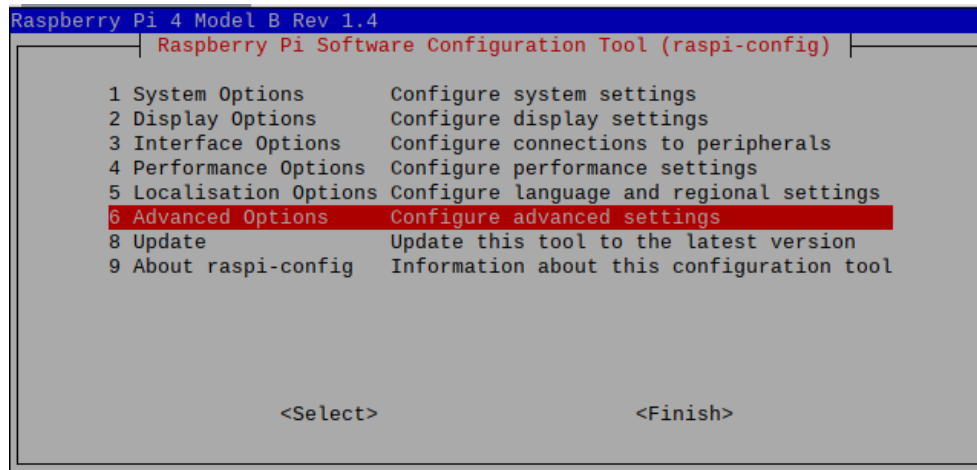


```
Raspberry Pi Software Configuration Tool (raspi-config)  
  
B1 SD Card Boot Boot from SD Card if available, otherwise boot from USB  
B2 USB Boot       Boot from USB if available, otherwise boot from SD Card  
B3 Network Boot  Boot from network if SD card boot fails  
  
<Ok>              <Cancel>
```

+ [ENTER]

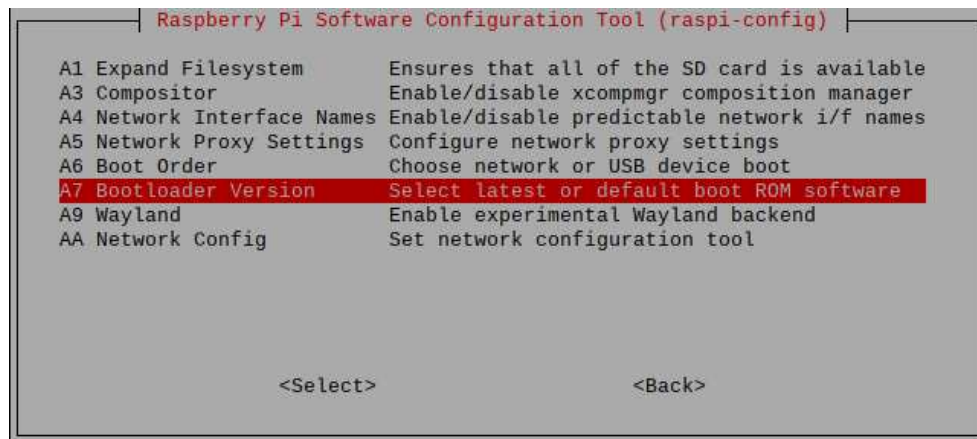
Press [ENTER] to confirm and to go back to the main menu.

Now once more use the arrow keys to navigate down to "**6 Advanced Options**" and press [ENTER].

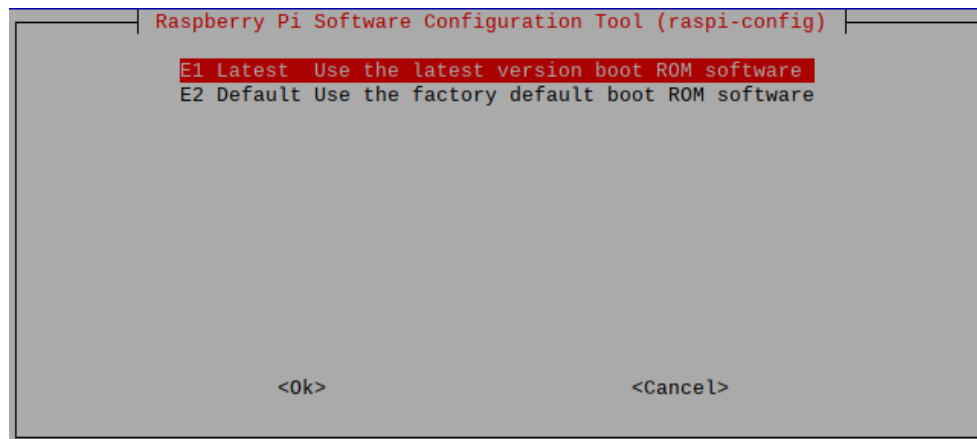


+ [ENTER]

This time move down to "**A7 Bootloader Version**" and press [ENTER]



+ [ENTER]



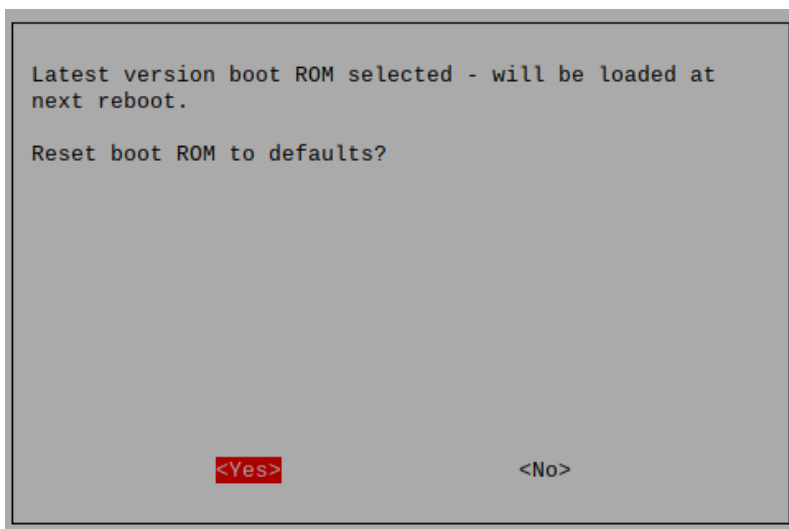
+ [ENTER]

Make sure that it is set to "**E1 Latest**" and press [ENTER]

You will be asked:

"Latest version boot ROM selected - will be loaded at next reboot.

Reset boot ROM to defaults?"



+ [ENTER]

Press [ENTER] for **<YES>**

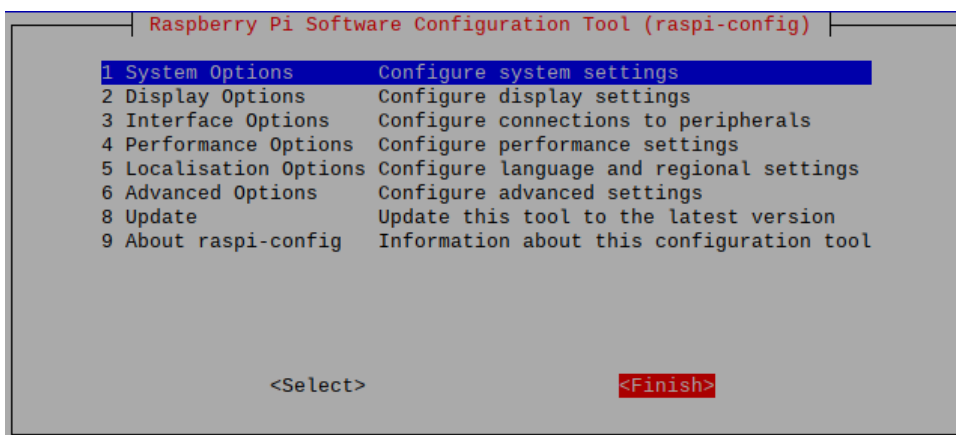
You will read "Boot ROM reset to defaults".



+ [ENTER]

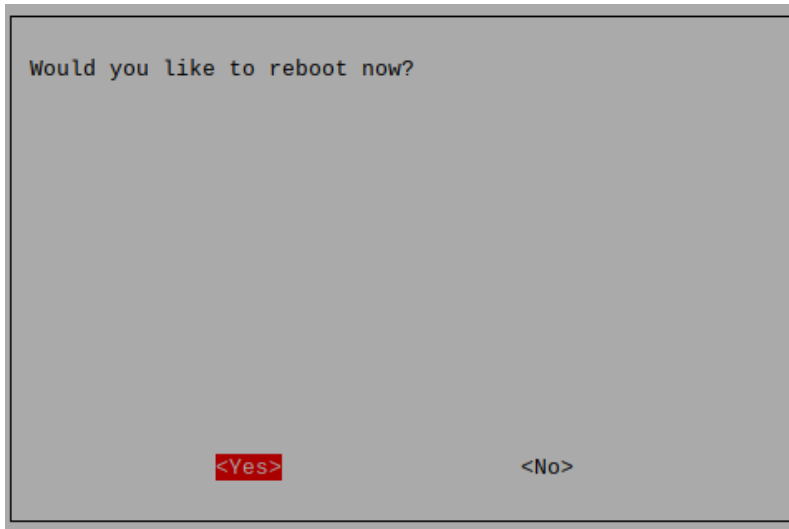
Press [ENTER] to go back to the start page of the raspi-config.

Navigate to **<Finish>** with the right arrow or Tab key and press [ENTER] once more.



+ [ENTER]

You will see reboot now?



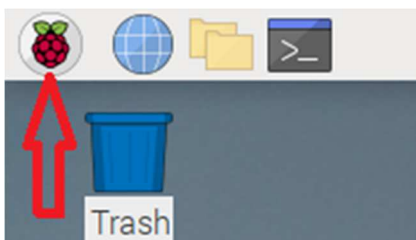
+ [ENTER]

Press [ENTER] to reboot.

- e) After rebooting go to the terminal once more and enter **sudo rpi-eeeprom-update** and you should see now the latest bootloader version from October 18 2022 (or later) with the RELEASE: "stable".

```
pi@raspberrypi: ~  
File Edit Tabs Help  
bash: warning: setlocale: LC_ALL: cannot change locale (de_DE.UTF-8)  
pi@raspberrypi:~$ sudo rpi-eeeprom-update  
BOOTLOADER: up to date  
  CURRENT: Tue Oct 18 10:57:44 UTC 2022 (1666090664)  
  LATEST: Tue Oct 18 10:57:44 UTC 2022 (1666090664)  
  RELEASE: stable (/lib/firmware/raspberrypi/bootloader/stable)  
           Use raspi-config to change the release.  
  
VL805_FW: Using bootloader EEPROM  
  VL805: up to date  
  CURRENT: 000138a1  
  LATEST: 000138a1  
pi@raspberrypi:~$
```

- f) Close the terminal!
Now click onto the Raspberry on the top left to Logout and Shutdown.



Disconnect power, remove the Raspberry OS drive and reconnect the double USB connector to start up with the XO-mini system and software.

DONE !!!

Your XO-mini Bootloader / Firmware is up to date!