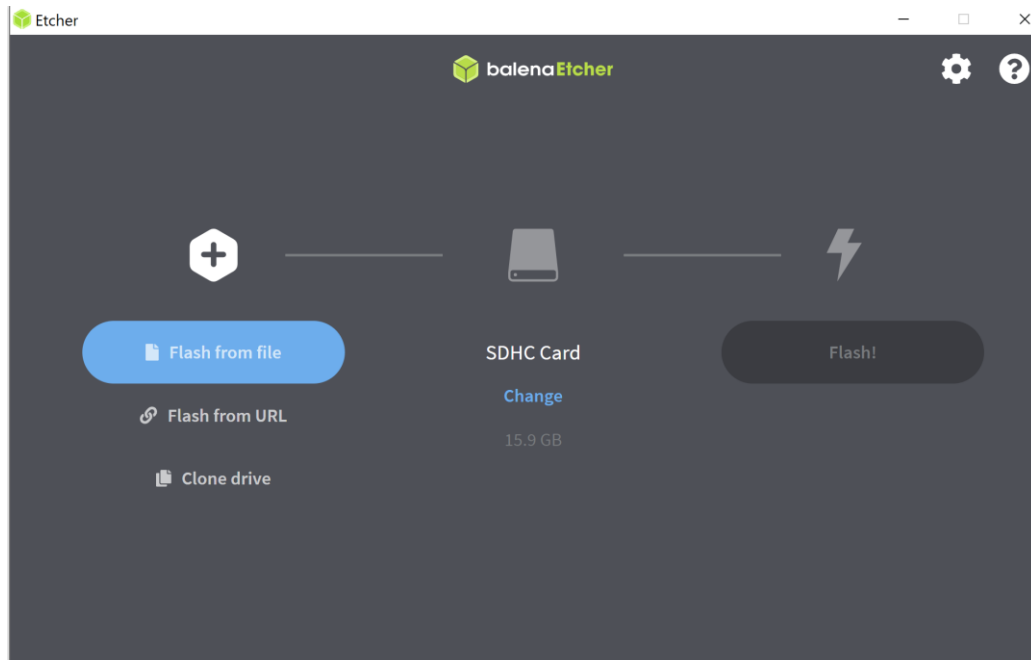


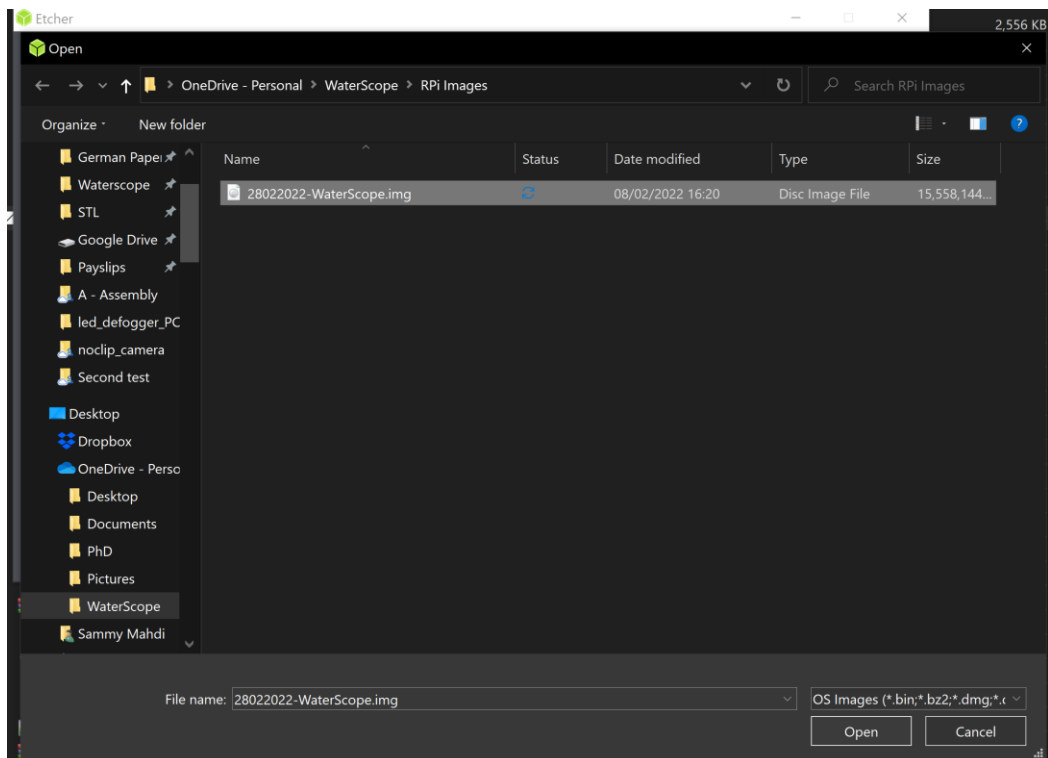
WaterScope Firmware/Software programming v1

Raspberry Pi SD card flashing

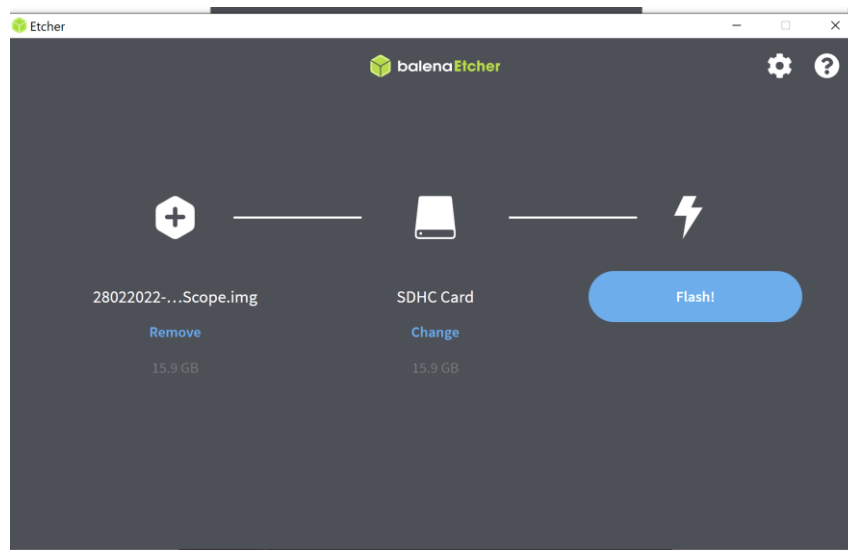
1. Download and install “Balena Etcher”
2. Insert empty SD card into the computer and open “Balena Etcher”



3. Select the latest WaterScope image i.e. (28022022_WaterScope.img)

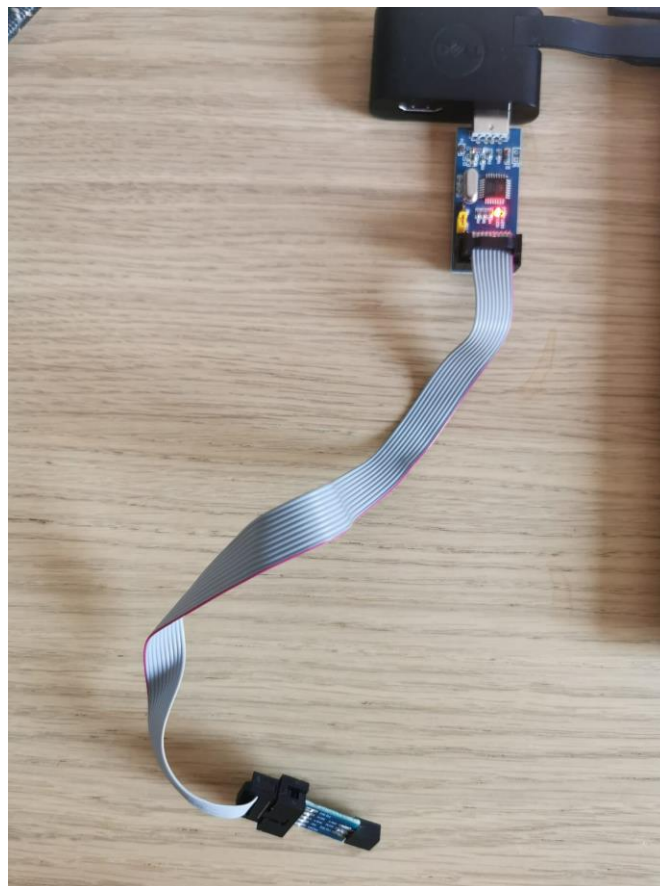


4. Press “Flash” and wait for the process to finish (~5 min)

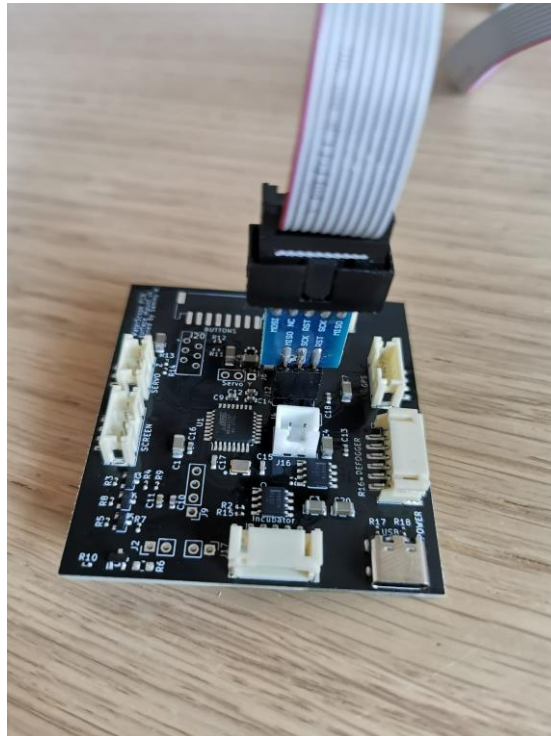


Programming the PCB firmware

1. Insert programmer into the USB port and install [USBAsp driver](#) if using for the first time.



2. Insert programmer into PCB as shown



3. Open terminal and go the WaterScope firmware folder

```
Command Prompt
Microsoft Windows [Version 10.0.19044.1526]
(c) Microsoft Corporation. All rights reserved.

C:\Users\sammy>cd C:\Users\sammy\Desktop\Firmware programming
C:\Users\sammy\Desktop\Firmware programming>
```

4. Burn the fuses with:

avrdude -C avrdude.conf -v -p atmega328p -c usbasp-clone -Pusb -e -U lock:w:0x3F:m -U efuse:w:0xFD:m -U hfuse:w:0xDE:m -U lfuse:w:0xFF:m

5. Burn firmware with:

avrdude -c usbasp-clone -p m328p -u -U flash:w:rtc_dual_36.hex:i

6. Check that the programming is complete:

```
Command Prompt

C:\Users\sammy\Desktop\Firmware programming>avrdude -c usbasp-clone -p m328p -u -U flash:w:rtc_dual_36.hex:i
avrdude: warning: cannot set sck period. please check for usbasp firmware update.
avrdude: AVR device initialized and ready to accept instructions

Reading | ##### | 100% 0.00s

avrdude: Device signature = 0x1e950f (probably m328p)
avrdude: NOTE: "flash" memory has been specified, an erase cycle will be performed
To disable this feature, specify the -D option.
avrdude: erasing chip
avrdude: warning: cannot set sck period. please check for usbasp firmware update.
avrdude: reading input file "rtc_dual_36.hex"
avrdude: writing flash (32768 bytes):

Writing | ##### | 100% 24.28s

avrdude: 32768 bytes of flash written
avrdude: verifying flash memory against rtc_dual_36.hex:

Reading | ##### | 100% 17.66s

avrdude: 32768 bytes of flash verified

avrdude done. Thank you.

C:\Users\sammy\Desktop\Firmware programming>
```