



# Haribo Kimchi Eel Documentation

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## Haribo Kimchi travel case

The complete eel is contained in the Haribo Kimchi travel case.



## Haribo Kimchi travel case



There is a piece of foam that helps protect the right stick of the transmitter while in transit.

The eel is placed upside-down. This approach helps prevent that the wheels experience too much strain when taking the eel in/out of the case.

Haribo Kimchi travel case



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Below the transmitter is a slot for a usb charger and two usb cables: one usb-c and one micro-usb cable.

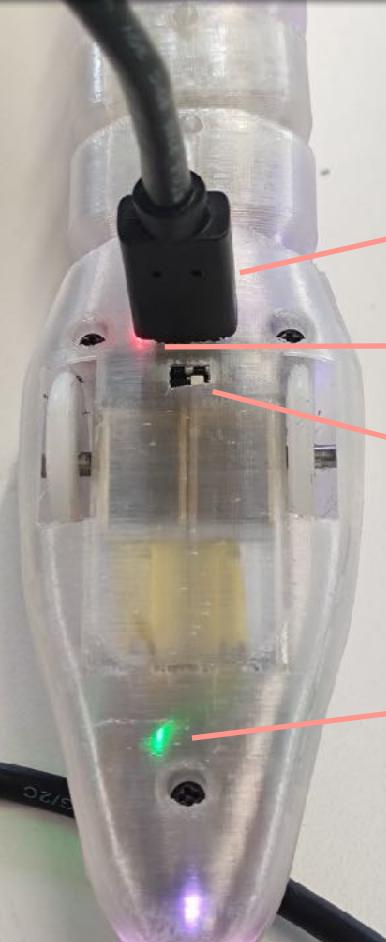
- \* The usb-c cable is for charging the eel or the transmitter.
- \* The micro-usb cable is for the MIDI connection between the computer and the transmitter.

## Haribo Kimchi travel case

Total contents of the travel case



## Eel physical interfaces



To charge the eel, insert USB-C cable into the usb-c port. See section “*Battery management*” for more info.

When a red light turns on next to the usb port, the battery is charging.

On/off switch of the eel. This is a delicate switch, handle with care please! Use fine tweezers or a toothpick to reach the switch.  
**Never transport the eel when switched on.** See section “*Battery management*” for more info.

Green status led of the wireless receiver. See section “*Receiver status lights*” for more info.

## Transmitter: front

Charging port. Tip: don't charge during operation. This introduces signal noise (visible in the eel's body lights).



On/off switch. Press for ~1s to activate

Switch select different Eel movement modes.

- \* Mode 1 (back): Eel moves at max speed.
- \* Mode 2 (middle): Eel has lower max speed.
- \* Mode 3 (forward): Like mode 1, but slightly more aggressive steering. Was intended to help with the desired 'wiggle' mode but to be honest, not sure if this mode is relevant.

The stick control should be quite straight forward:

- \* Left is left
- \* Right is right
- \* Up is forward
- \* Down is backward

## Transmitter: back

FYI: the antenna should always be connected to the transmitter while it is powered on. The transmitter module can be damaged if it doesn't have an antenna to dump its power into. There is no need to ever unscrew the antenna.

The 'SETUP' and 'BIND' buttons never need to be used. Please make sure that they are not accidentally pressed, particularly while powering on the transmitter, to prevent unwanted changes in the configuration of the transmitter.



## Transmitter: MIDI connection



Connect the transmitter to a computer using a micro-usb cable. This exposes the transmitter's internal MIDI interface to the computer. See section “*MIDI channel usage*” for more info.

## MIDI channel usage

- \* When plugged in to the computer (using the micro-usb port on the bottom corner of the transmitter), the computer should detect a MIDI device with the name “Teensy” in it. The transmitter does not need to be switched on for this.
- \* All MIDI commands should be Control Change (CC) commands, over MIDI Channel 1.

Eyes + mouth amplitude (aka ‘speaking’)	CC 0 [0-127]
Head lighting mode 1 - only eyes, mouth off	CC 3 [0] + CC 2 [127]
Head lighting mode 2 - eyes & mouth - mouth is static	CC 3 [63] + CC 2 [127]
Head lighting mode 3 - eyes & mouth - mouth also ‘speaks’	CC 3 [127] + CC 2 [127]
Head lighting mode 4 - eyes & mouth - eyes are static, mouth ‘speaks’ - <b>if set, this overrides modes 1-3. To access modes 1-3, set CC 2 to value 127.</b>	CC 2 [0]
Body light - blue - front	CC 30 [0-127]
Body light - blue - back	CC 31 [0-127]
Body light - pink - front	CC 32 [0-127]
Body light - pink - back	CC 33 [0-127]

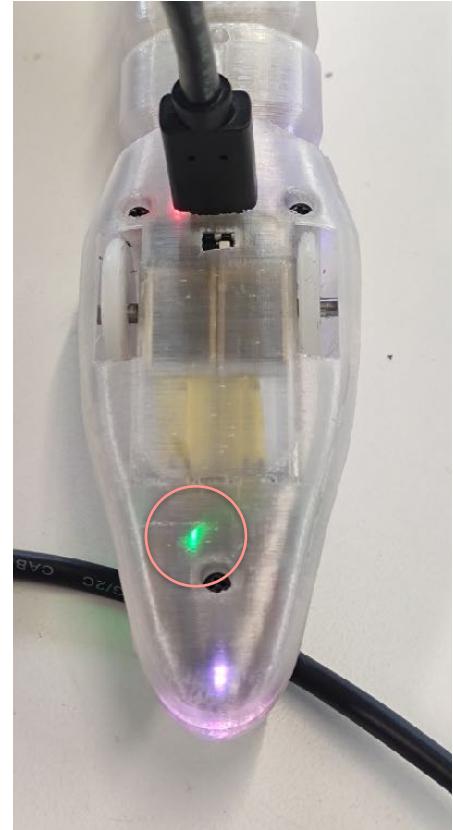
## Battery management

- \* The battery in the eel is a 1100mAh Li-ion vape cell battery.
- \* Unfortunately there is no knowing what the charge state of the battery is, so we ask you to be vigilant of over-use to prevent a dead battery.... Here are a few pointers that should help:
  - \* We estimate that the eel can be used continuously for at most 2 hours before the battery needs charging.
  - \* Charging is slow (but that's safe). For every hour used, the eel could need about 2 hours to recharge.
  - \* Never transport with a full battery. Full Li-ion batteries are a safety hazard.
- \* Regarding charging and travel we propose the following:
  - \* After a performance, switch off.
  - \* Charge again only if a practice session or performance is scheduled.
- \* **BTW:** all of the above is also true for the transmitter! Its battery lasts maybe 3 hours (not sure), and it probably charges faster than the eel, but other than that the same logic applies: don't charge if not going to be used, and never transport fully charged.

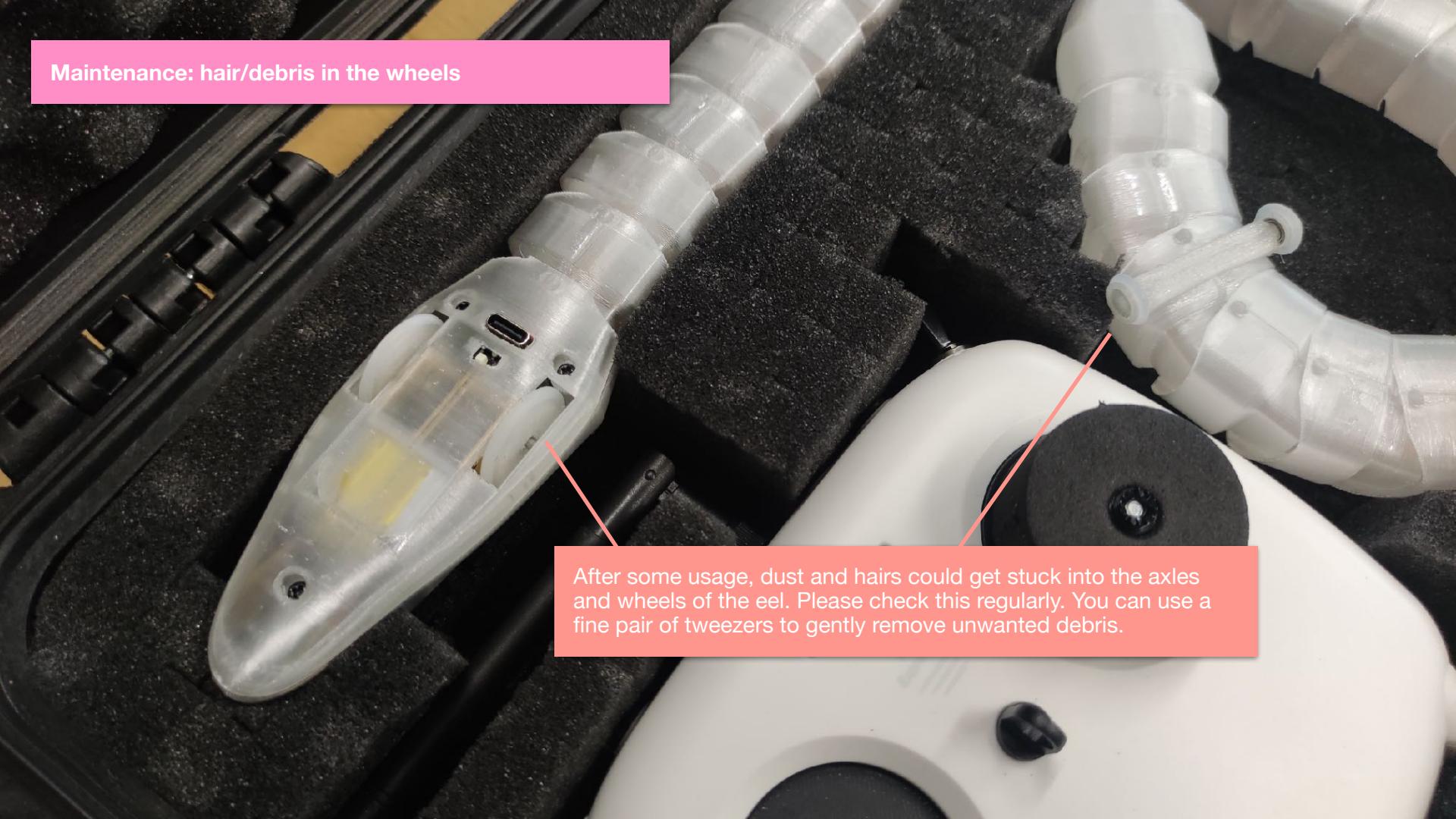


## Receiver status lights

- \* The receiver uses the ExpressLRS wireless protocol. Its status led has different blinking patterns to communicate its state.
- \* The main led states to be aware of are:
  - \* Slow blink 500ms on/off: Waiting for connection from transmitter.
    - \* It's best to always have the transmitter on before turning on the eel.
  - \* Solid on: Connected to a transmitter
- \* Other led states that could happen:
  - \* Fast blinking 25ms on/off: WiFi mode enabled.
    - \* If the eel hasn't made connection to the transmitter within ~120 seconds, it will switch to WiFi mode. Just power cycle the eel to put it back in "waiting for connection" mode.
  - \* Double blink then pause: Binding mode enabled.
    - \* If for some reason you have power cycled the eel quite quickly for 3 times, the receiver automatically goes into binding mode. Turn off the eel for about 30 seconds before turning back on. It should go back to "waiting for connection" mode.
- \* For a full list of its status led blinking states, see: <https://www.expresslrs.org/quick-start/led-status/#receiver-led-status>.



## Maintenance: hair/debris in the wheels



After some usage, dust and hairs could get stuck into the axles and wheels of the eel. Please check this regularly. You can use a fine pair of tweezers to gently remove unwanted debris.

## Troubleshooting: wheels

The wheels of the eel are tiny ball bearings with a 3d-printed cover and a white silicone o-ring. They are attached to the axle using just friction fitting so it's not unthinkable that they might let go at some point, although we haven't seen them detach spontaneously yet... If a wheel does detach, carefully press it back into the axle, that should be it.

We have also provided a little bag with a few spare wheels.



## Troubleshooting: receiver connected but eel unresponsive [1/3]

There is an exceptional case where a setting within the receiver is lost and has to be manually re-set. You can recognize this case by the following:

- \* transmitter and eel are off
- \* the transmitter is powered
- \* the eel is powered
- \* the receiver first slowly blinks green and then locks on to the transmitter and becomes solid green
- \* the eel keeps communicating that it doesn't have connection (the eyes+mouth flash red)



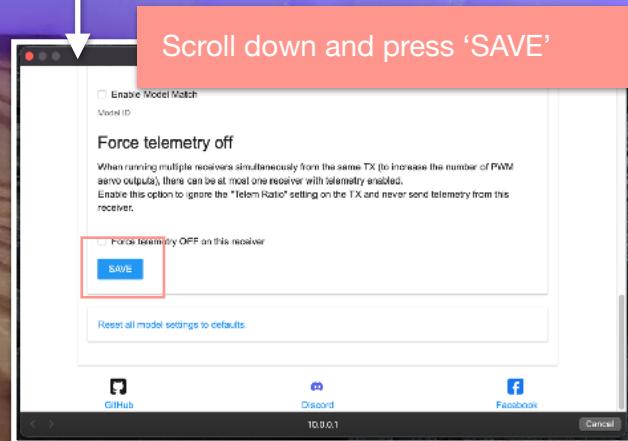
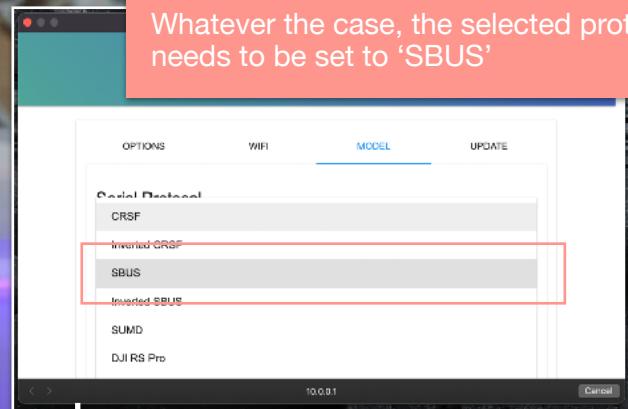
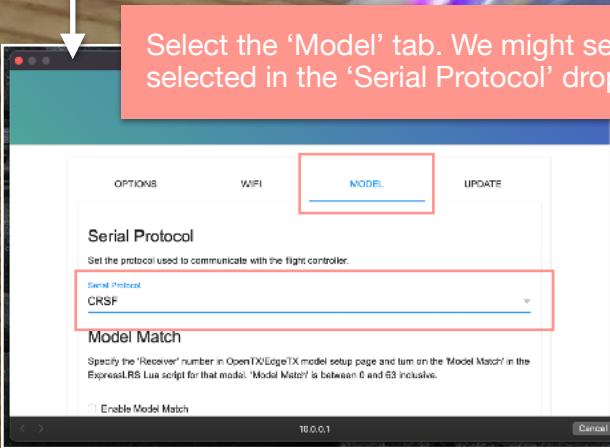
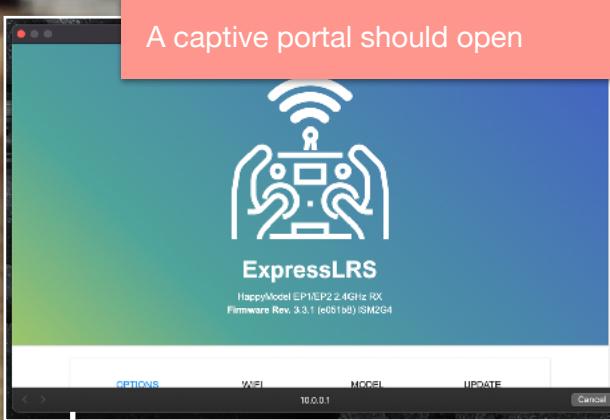
To address this issue, do the following:

- \* turn off the transmitter
- \* turn off the eel, wait a few seconds, and turn on again
- \* the receiver slowly blinks green, and after ~60 seconds will start rapidly blinking green
- \* the receiver is now in wifi mode and can be configured via wifi

Using a computer or your phone, you should see "ExpressLRS RX" as an available wifi access point.

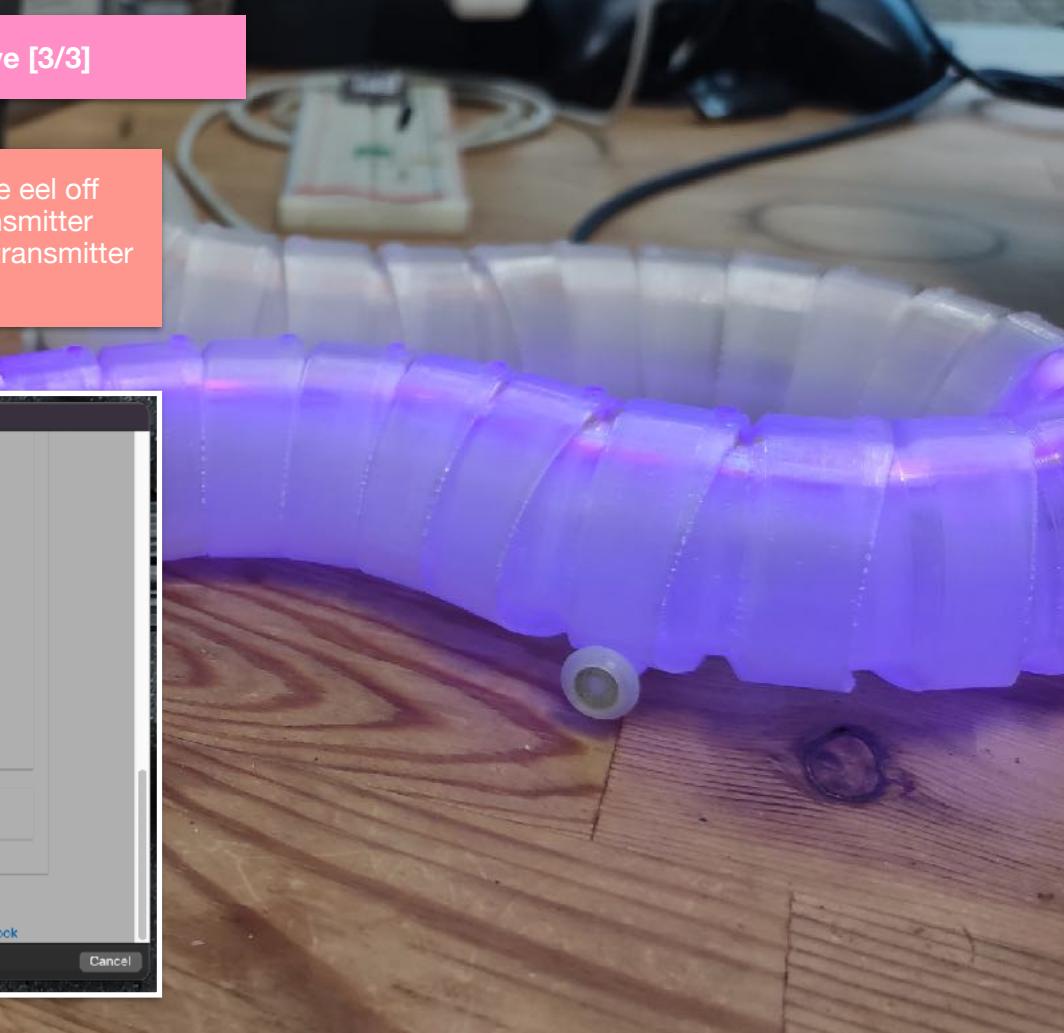
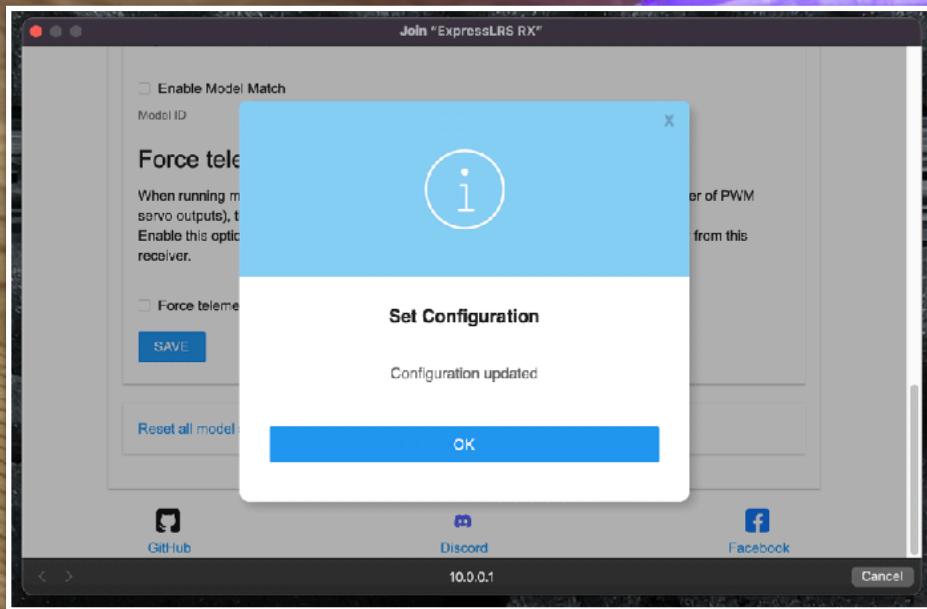
Connect to it using the password "expresslrs".

## Troubleshooting: receiver connected but eel unresponsive [2/3]



## Troubleshooting: receiver connected but eel unresponsive [3/3]

The receiver should now be configured correctly. Turn the eel off again, wait a few seconds, and switch on again. The transmitter should also be on. Now, after making connection to the transmitter again, the eel should work again as desired.



## Troubleshooting: receiver doesn't connect to transmitter [1/2]

If you find that the transmitter cannot connect to the receiver although this should happen, you could check if the receiver is set up correctly. You can recognize this case by the following:

- \* transmitter and eel are off
- \* the transmitter is powered
- \* the eel is powered
- \* the receiver slowly blinks green, but never locks with the transmitter



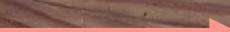
To address this issue, do the following:

- \* turn off the transmitter
- \* turn off the eel, wait a few seconds, and turn on again
- \* the receiver slowly blinks green, and after ~60 seconds will start rapidly blinking green
- \* the receiver is now in wifi mode and can be configured via wifi

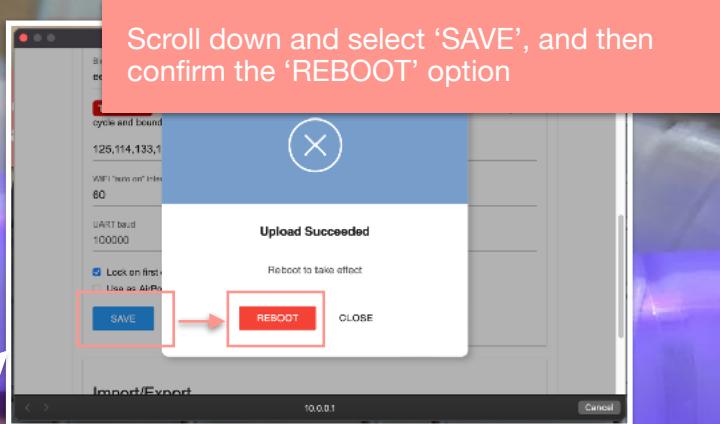
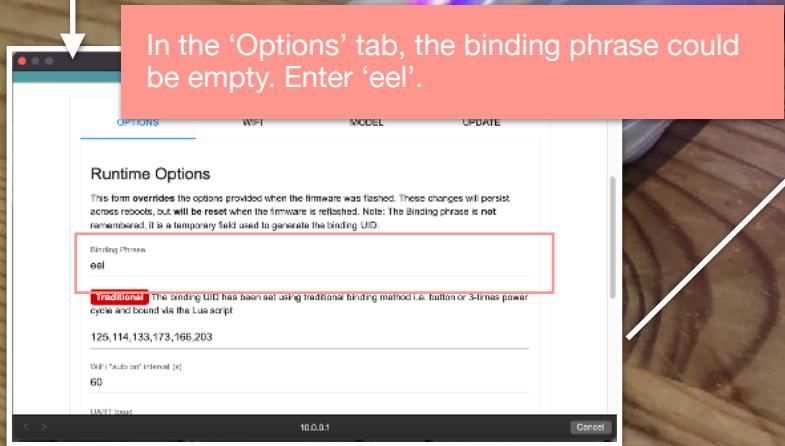
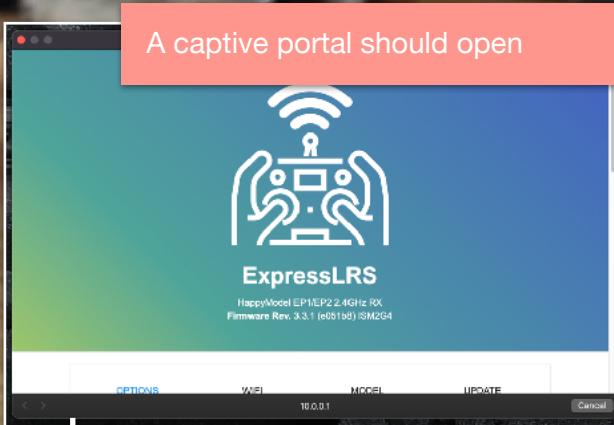


Using a computer or your phone, you should see "ExpressLRS RX" as an available wifi access point.

Connect to it using the password "expresslrs".



## Troubleshooting: receiver doesn't connect to transmitter [2/2]



The receiver should now bind to the transmitter.

Perhaps consider power cycling both the eel and the transmitter to be sure that everything starts up as it should.