

SeaLabMOS Operating Instructions

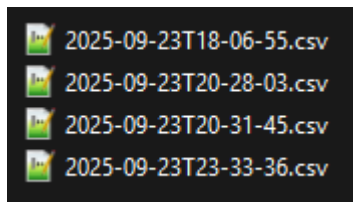
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Deployment Steps

1. Unscrew the end cap. Ensure the black rubber on the end cap is clear of debris/dust
2. Inspect the inside sealing surface of the PVC and clean/wipe off debris/dust
3. Depress the white button, once
4. Observe five white flashes and one steady color for battery voltage (IAW table in box)
5. Insert end cap and tighten to finger tight. I have not used tools for the end cap safely down to (so far) 70 meters. Depending how strong your fingers are, you will reach a point where the black rubber stops expanding and the end cap spins
 - a. Look at the sealing surface between the black rubber and the PVC pipe. If you see something between the rubber and the PVC, remove and clean
6. Slide nose cone over pipe and electrical tape to the pipe (take photos pre/post-deployment for me please!)
7. Deploy and recover
8. Rinse with freshwater. You may feel a need to turn it off right away upon recovery, but there is plenty of time (over 24hrs+ of battery life) so there is no rush
9. Unscrew the end cap and turn off the system
 - a. Sometimes I've needed a wrench to start unscrewing the end cap. This is something I've experienced once the system has been at depth, but that was in Alaska with much colder water. Unsure if water temp / pressure / or both play a part. If you notice unscrewing is noticeably more difficult let me know?

Data Offload

1. Ensure the system is dry (water won't get on the system tray when removed) and remove the end cap, placing it aside somewhere the black rubber won't get scratched
2. Watch the sensor STEMMA QT cable, then gently slide out the system tray
 - a. It'll be easier to slide in / out in a specific rotational orientation. The PVC is not perfectly circular while the 3D printed tray is. If you spin the tray inside the pipe, you will see what I mean
3. Depress the microSD card and it will click out (standard like a camera or similar)
4. Connect to computer (I've included a microSD card to SD card in the box in case useful). **The system is set to UTC.** It generates a new text file every power on (example →)
 - a. YYYY-MM-DDThh-mm-ss.csv
5. The data will look a little weird as it has extra commas. This is because all the SeaLabMOS use the same header. Import as usual using Python/etc using the header on the first line and it should read correctly. Remove the NaNs or ignore them
6. Before the system is placed in the water you will see that **brDepth has a value that is not zero** (due to local atmospheric pressure). It's on my list to do this on system power-on, but for now I account in post by zeroing the data by adding/subtracting from the brDepth column to make the depth value zero before the system got wet



Endurance (pressure only system with 2.2Ah battery)

A fully charged system (starting at 4.2V) will sample for at least 36 hours straight. It *should* last for around 72 hours of active sampling. I have not endurance tested a pressure only system yet but am confident to say at least 36 hours.

Charging

Plug the system into any normal USB-C phone charger. **When charging, make sure to depress the power switch** to connect the battery to the Feather. A solid orange LED will light up on Feather (it's the Feather's battery charging light that turns off when the battery is at 4.2v). If the light is blinking/flashing, it means the board has power from the USB-C but the power switch is not depressed.

The firmware does have a charge mode, but I just unplug the microSD (leaving it in the slot, just unplugged) so I don't have to send new firmware. The onboard LED will flash red without the microSD, which is fine.

Bar30 Depth Sensor Specs (From Blue Robotics' website)

- Relative Accuracy 0 to 60°C: ± 2 mbar (2 cm in fresh water)
- Absolute Accuracy 0 to 45°C: ± 200 mbar (204 cm in fresh water)
- Resolution: 2mbar (2 mm in fresh water)

The sensor also outputs temperature, which is logged to the microSD card, but...

- Relative Accuracy $\pm 2^{\circ}\text{C}$
- Absolute Accuracy $\pm 4^{\circ}\text{C}$

Call/text anytime if questions or troubleshooting issues

Happy sampling!
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