

A small form factor device that provides and records telemetry data with high accuracy, high granulation and real time monitoring.

The device will have an onboard screen where the rower or coxswain can view their choice of data the way they want.

The device will also connect to the coaches phone and provide real time monitoring of all data being recorded on the device.

A "Piece" can be set by the coach or athlete, which will correspondingly be set automatically on the other device. (ie, a coach can type 6 x 1500 m on their phone, the same way it would be set on a concept pm5 ergo, and that will pop up on the in boat device). Things like goal ratings can also be set, and if the actual rate is different a prompt arrow can present on the screen showing the athlete they need to go higher or lower.

Data visualisation and operation on the device will be similar to a concept PM5 erg screen. The mobile app will provide the option of real time monitoring, as well as remote control, and methods for extremely detailed analysis (such as 3D visualisation of the boats rotational and translational acceleration, video recording, and other such options).

Minimum Product Data Available to the device:

- Acceleration data (similar to what would be available to a minimax, the acceleration of the boat throughout the drive and the recovery on a time domain graph)
- Speed
- Distance
- Time
- Distance/Stroke
- Stroke counter
- 3 Dimensional rotational data (Roll, Pitch and Yaw)
- 3 Dimensional acceleration and displacement data (this can help to show the vertical lift of a boat through the drive for example, plus other useful information).
- GPS Data to map the path of the boat
- The coach, through the app, video parts of the piece, which will be time-stamped to the piece within the app. (ie, the coach sees on the app the boat slows down at the front due to a slow catch, and mid-piece takes a recording to show the athletes later. The athletes can then physically see the way their technique objectively affects the boat after the session)
- Ambient Temperature

Current Hardware:

- Raspberry Pi 4,(after initial prototype, this will be converted to a raspberry pi CM4 wireless)
- 128 Gb SD card
- Adafruit 9-DOF Orientation IMU Fusion Breakout - BNO085 (BNO080) - STEMMA QT / Qwiic
- Adafruit Ultimate GPS Breakout - 66 channel w/10 Hz updates - Version 3
- Battery shield and power supply
- Screen (OLED or LCD)
- Up and Down push buttons, enter and back push buttons.
- Waterproof enclosure

Software Requirements (note: In the above spec, 1 stroke = (min acceleration point) to (min acceleration point +1):

- Read sensor values
- Send and receive data in realtime via bluetooth to a custom built mobile app
- Visualise data on Screen
- Record data, and be able to sync the data to the paired bluetooth phone