DESIGN: Monitoring Station Packaging

Great Lakes Data Watershed (gldw.org)

Instrument Toolkit Program

Revised: June 10, 2019

The Instrument Toolkit Program has been created to support the development of high quality monitoring devices based on commonly available hardware and utilizing VDAB dataflow programming and customized nodes for instrument construction.

**This document describes the three different monitoring station packages that will be supported by the toolkit.**

All of these stations will support acquisition from up to four different sensors. The Integrated and Standalone PI3 Stations based stations will include VDAB and would be capable of serving as a Hub for other stations in the vicinity. The standalone Mayfly station would include sketch components making it easy to communicate with VDAB running on another station or standalone hub.

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Integrated Station** | **PI3-VDAB Hub** | **Mayfly Logger** |
| Station Size | * Station size 6”x6”x3” | * Station size 4”x4”x2” | * Station size 3”x3”x2” |
|  |  |  |  |
| Power Consumption | * Moderate | * Moderate | * Low – Very Low |
| Battery | * Rechargeable Moderate | * Rechargeable Moderate | * Disposable * Rechargeable Small |
| Solar Power | * 12x12 panel | * 12x12 panel | * 4x4panel |
| Uplink Radio | * Lora Wan * 4 G LTE | * Lora Wan * 4 G LTE | * Lora Wan * 4 G LTE * WiFi (requires hub) * ZigBee (requires hub) |
| Downlink Radio (as Hub) | * Lora Wan * WiFi * Zigbee and ZWave | * Lora Wan * WiFi * Zigbee and ZWave | NA |
| Link Protocol | * VDAB * MQTT * HTTP | * VDAB * MQTT * HTTP | * MQTT * HTTP |
| Software | * VDAB | * VDAB | * C Sketches |
| Acquisition channel | * 4 Analog * IC2 | NA | * 4 Analog * IC2 |
| Optional Station  Features | * Fluid Control * Serial Control * Mechanical Control | NA |  |

# CONFIGURATION: Standalone Stations



**Integrated Station**

Mayfly

PI3 -VDAB

**Integrated Station**

Mayfly

PI3 -VDAB

**Integrated Station**

Mayfly

PI3 -VDAB

# CONFIGURATION: Separate Hub – Data Loggers



**Mayfly Logger**

Mayfly

**PI3 –VDAB Hub**

PI3 –VDAB

**Mayfly Logger**

Mayfly

**Mayfly Logger**

Mayfly

# NOTES AND SUPPORTING INFO

Create something similar to WaspMote based on Pi hardware.

Things needed..

* Input for up to 4 electrode
* node to calculate result from voltage.
* Different radio types.
* 3D printing of a waterproof case?

