Blue Ocean Gear

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FARALLON SMART BUOY SYSTEM™ MANUAL

Blue Ocean Gear, Inc.
Proprietary

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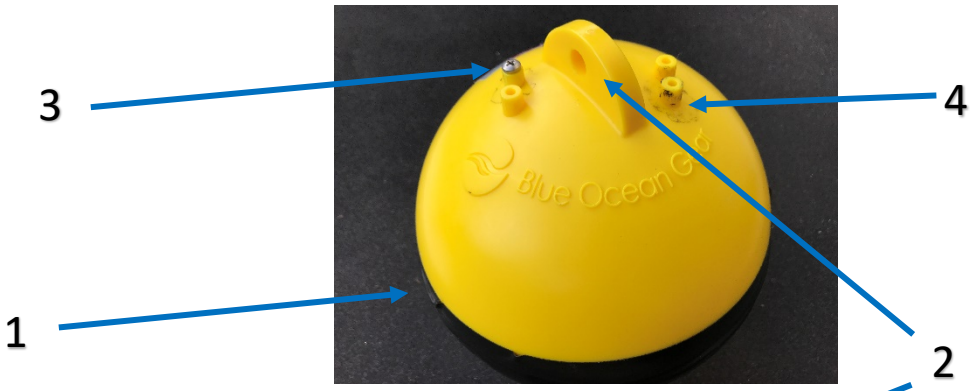
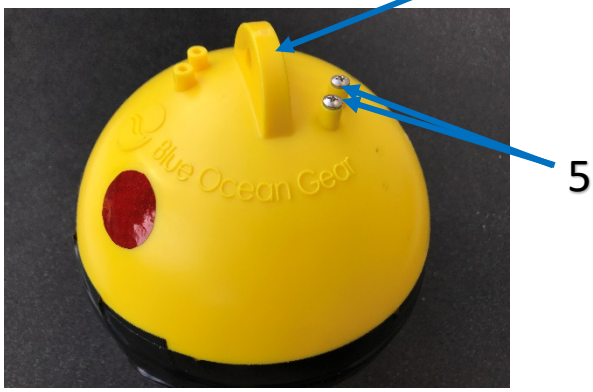
Diagram of a Farallon Smart Buoy™



Top Half of Smart Buoy



Bottom Half of Smart Buoy

Buoy Parts:

1. Marine seal covering *
2. Attachment ring(s)
3. Vacuum port
4. Depth sensor port
5. Saltwater sensor probes
6. Buoy ID

WARNING: Do not attempt to open the buoy or damage or remove the marine seal covering or seal material between the two halves of the buoy. This will compromise the integrity of the water-tight seal. Do not remove the vacuum port screw or the saltwater sensor probe screws.

Farallon Smart Buoy Storage

Indoor storage of Smart Buoys is recommended prior to deployment, as low temperatures outside may discharge the battery prematurely.

Farallon Smart Buoy Deployment

Buoy to Gear Attachment

The Smart Buoy should be attached as **kicker (trailer) buoy** to the main buoy of the gear using **2-3 meters of 5/16" line**. Tie off the line with your preferred knot to ensure secure attachment (see figures below).

IMPORTANT: The line should be threaded through **BOTH attachment rings, with the knot positioned to the lower edge of the black tape,** as shown in the image below. This ensures the buoy floats upright in the current. Attaching to only a single ring will cause the buoy to tip off-center, preventing optimal sensing and reducing communication capability. It is also possible to loop and splice line through each ring and knot together, as opposed to running around the full circumference of the buoy.

Knot/harness below the black centerline of buoy

First Time Use

The Smart Buoy may be shipped with the saltwater sensor covered with tape. **Remove the tape** before deploying the buoy. Do not remove the screws underneath.

Farallon Smart Buoy Components

Sensors

GPS

The Smart Buoy is equipped with an internal GPS receiver to provide location information.

Depth Sensor

The Smart Buoy is equipped with a depth sensor to provide information regarding buoy submergence.

Saltwater Sensor

The saltwater sensor allows the buoy to turn on when it detects that it is in salt water. The buoy will turn on when it has been in water for at least 15 minutes and will turn itself off when it has been out of the water for at least 5 minutes.

To avoid activating the buoy, take care to not touch both terminals simultaneously when handling the buoy, and avoid placing on surfaces that may be conductive.

The saltwater sensor should be rinsed monthly to clear away biofouling or other growth. This will ensure the correct operation of the sensor.

Communications

The Smart Buoy is equipped with satellite transmission capability via the Iridium satellite network.

Basic Functionality and Performance

Once deployed, the Smart Buoy will float upright in the water, with the top half of the buoy (with vacuum port and depth sensor) above the waterline. This allows the internal antennae to remain pointed upward.

Long Life Mode when gear is set:

- Depth and acceleration of the Smart Buoy are measured every 5 minutes.
- Smart Buoy location is determined/recorded every 2 hours if on the water surface to measure drift.

- Smart Buoy location is transmitted once per day under nominal conditions (where buoy drift has not exceeded any thresholds). **Location will be displayed as a green marker on the map display.**
- If the Smart Buoy is submerged, it will transmit location, depth and time submerged data within 5 minutes upon surfacing.
- When retrieving gear, the Smart Buoy will send a message within 5 minutes of removal from the water. If it remains out of the water, it will turn itself off. It may be necessary to dry the saltwater sensor terminals off to ensure this response.

Note: to facilitate retrieval of gear, each Smart Buoy can be individually commanded via the mobile app (or communication with Blue Ocean Gear personnel) to operate with Fast Update Mode, which will transmit data hourly. This change must be commanded at least 24 hours in advance of retrieving the gear attached to the specific Smart Buoy.

Fast Update Mode:

- Depth and acceleration of the Smart Buoy are measured every 5 minutes.
- Smart Buoy location is determined/recorded every hour if on the water surface.
- Smart Buoy location is transmitted every hour under nominal conditions (where buoy drift has not exceeded any thresholds). **Location will be displayed as a green marker on the map display.**
- If the Smart Buoy is submerged, it will transmit location, depth, and time submerged data within 5 minutes upon re-surfacing.
- When retrieving gear, the Smart Buoy will send a message upon removal from the water after 5 minutes. If it remains out of the water, it will turn itself off. It may be necessary to dry the saltwater sensor terminals off to ensure this response. **Once it is reset in the water, the Smart Buoy will revert to the slower, Long Life Mode with no external command required.**
- If the gear is not retrieved right away, the Fast Update Mode will last a maximum of 2 days, after which the Smart Buoy will revert to Long Life Mode with no external command required.
- At any point within the 2 days, the Smart Buoy can be commanded back to Long Life Mode by the user via the mobile app (if, for instance, it was determined that the particular buoy would not be hauled right away). Note: There may be a delay of an hour (maximum) between the command sent and the buoy changing to the Long Life Mode. This means you may see buoy data come in for maximum an hour after sending the message.
- It is recommended to only use this mode for retrieval, as remaining in Fast Update Mode will reduce battery life significantly.

Buoy Locator Maps and Data

Website

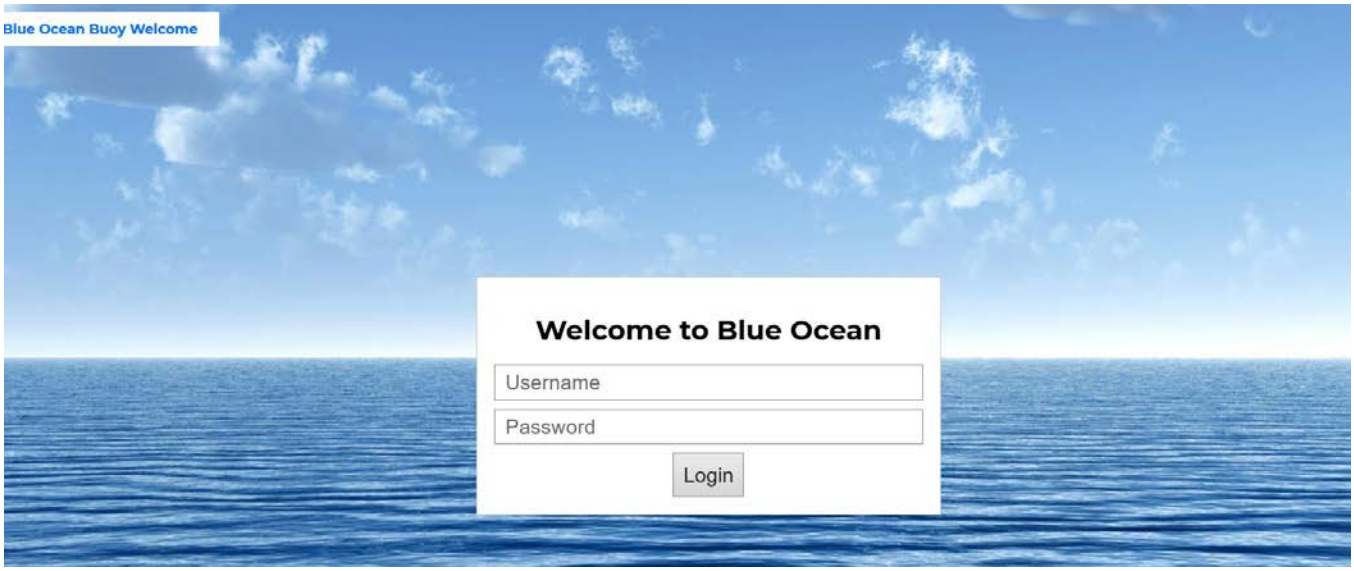
https://bluevue.boggroup.net/#/login

Buoy Identifiers:

Each buoy is given an identifier that will be provided separately.

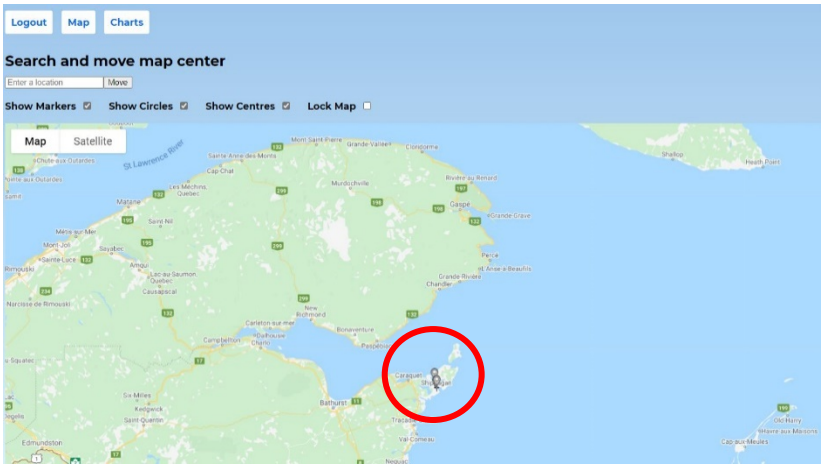
Map Display

The Smart Buoy web-based interface is accessed using the website indicated above.



On the login page, enter username and password (case-sensitive). Login information will be provided separately.

The display defaults to a map display of all Smart Buoys assigned to a unique user as shown:



The check boxes indicated on the top of the screen allow the user to display buoy markers indicating the location of each buoy, circles indicating the 200m radius around the deployment location, and the centers indicating the deployment location of each buoy.

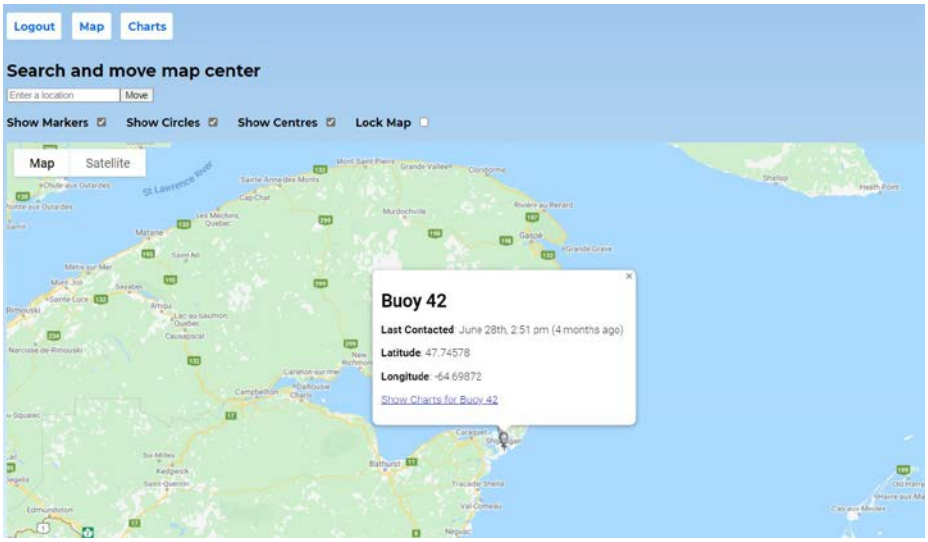
The + and – indicators at the lower right of the display can be used to zoom in and zoom out to scale the display view.

The Lock Map check box allows the user to set the zoom for the duration they are logged in.

The marker color indicates the following:

- Green: Nominal update for active buoy in the water
- Red: The buoy has moved beyond the threshold from its last position fix
- Blue: The buoy has just resurfaced from being submerged
- Grey: The buoy has not transmitted in >24 hours or is in Standby mode (out of the water)

Clicking on the Smart Buoy marker on the map display will cause a pop-up display box to appear:



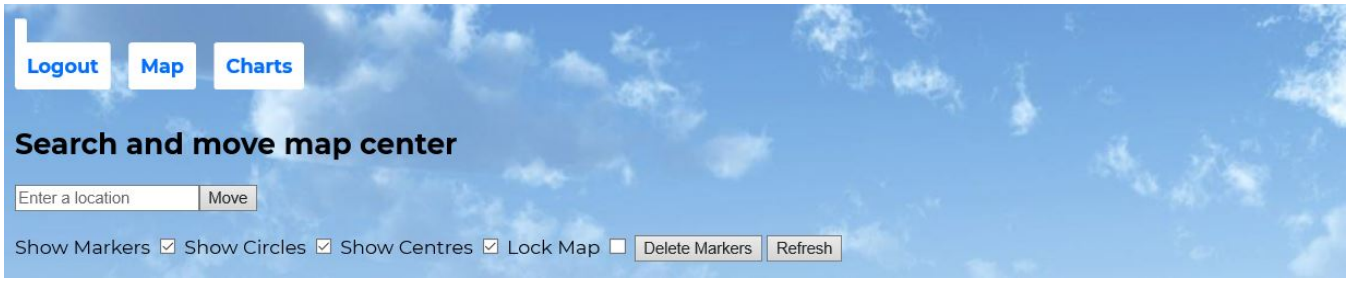
Displayed data includes:

- Buoy Id: Buoy identification number
- Whether buoy is in or out of water
- Date/Time Last Data Received
- Latitude: latitude coordinates

- Longitude: longitude coordinates
- Battery percent charge remaining
- Date/Time Next Data Expected
- Link to Charts page for that buoy

Charts

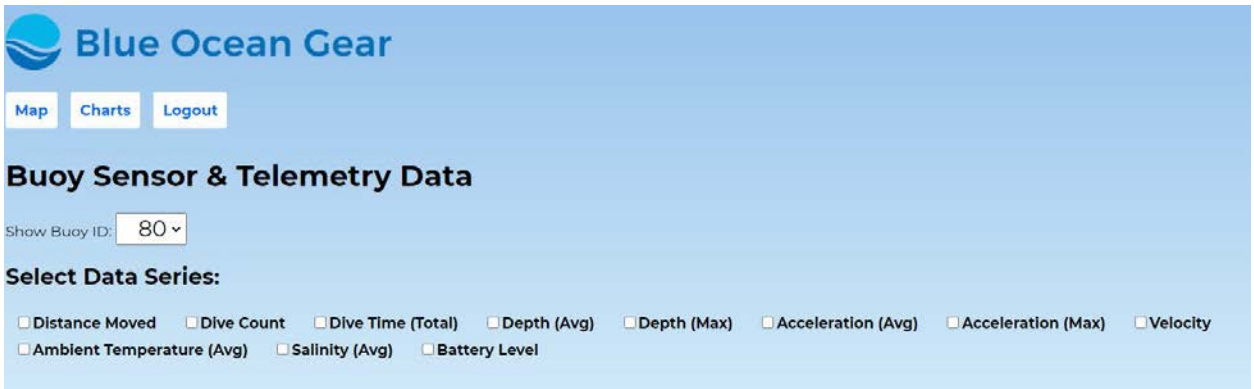
At the top of the page, a bar indicates available pages for 'Map' and 'Charts':



Clicking on the "Charts" box will bring up the display of Smart Buoy sensor data.

The drop-down menu allows selection of the particular Buoy ID to display.

The check boxes allow the user to select which charts to display.



Displayed parameters:

Distance Moved: Displays the distance that the Smart Buoy has been displaced from its previous detected location, in meters.

Dive Count: Displays the number of times that Smart Buoy has been submerged since being deployed.

Dive Time: Displays the amount of time the Smart Buoy has been submerged in seconds, if it has recently surfaced. After the first transmission after surfacing, the value is reset to zero until the next time the buoy submerges.

Average Depth: Displays the average depth in fathoms that the Smart Buoy has experienced, if it has been recently submerged. After the first transmission after surfacing, the value is reset to zero until the next time the buoy submerges.

Maximum Depth: Displays the maximum depth in fathoms that the Smart Buoy reached if it has recently been submerged. After the first transmission after surfacing, the value is reset to zero until the next time the buoy submerges.

Average Acceleration: Displays the average acceleration (in meters/second-squared) that the Smart Buoy has experienced since its last transmission.

Maximum Acceleration: Displays the maximum acceleration (in meters/second-squared) that the Smart Buoy has experienced since its last transmission.

Velocity: Displays the Smart Buoy instantaneous velocity in knots.

Ambient Temperature: Displays the ambient temperature outside the buoy.

Average Salinity: (not currently calibrated).

Battery Level: (not currently calibrated).

Mobile Application for iPhone Devices:

The mobile app can be downloaded from the iPhone app store:

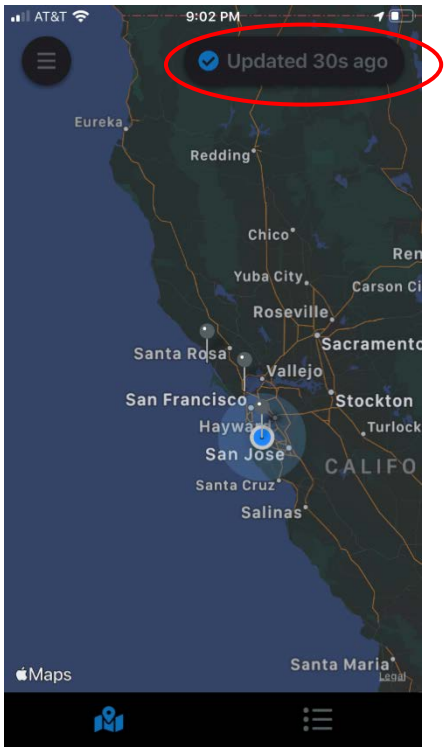
https://apps.apple.com/us/app/buoy-locator/id1531520692

The app can also be found by searching for 'Blue Ocean Gear' in the iPhone app store.

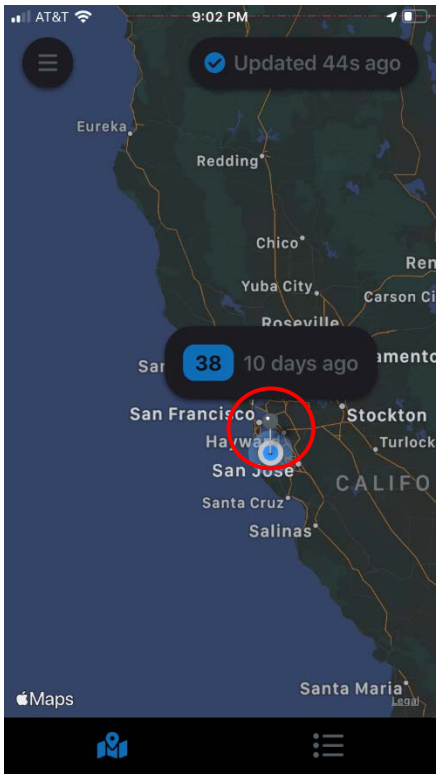
Login credentials are the same as for the web interface.

The initial page displays a map with buoy locations indicated by pins. The pin will be green for data received in the past 24 hours. If data has not been received in over 24 hours, the pin will turn grey. The blue pin indicates the location of the user's iPhone, if location information has been turned on.

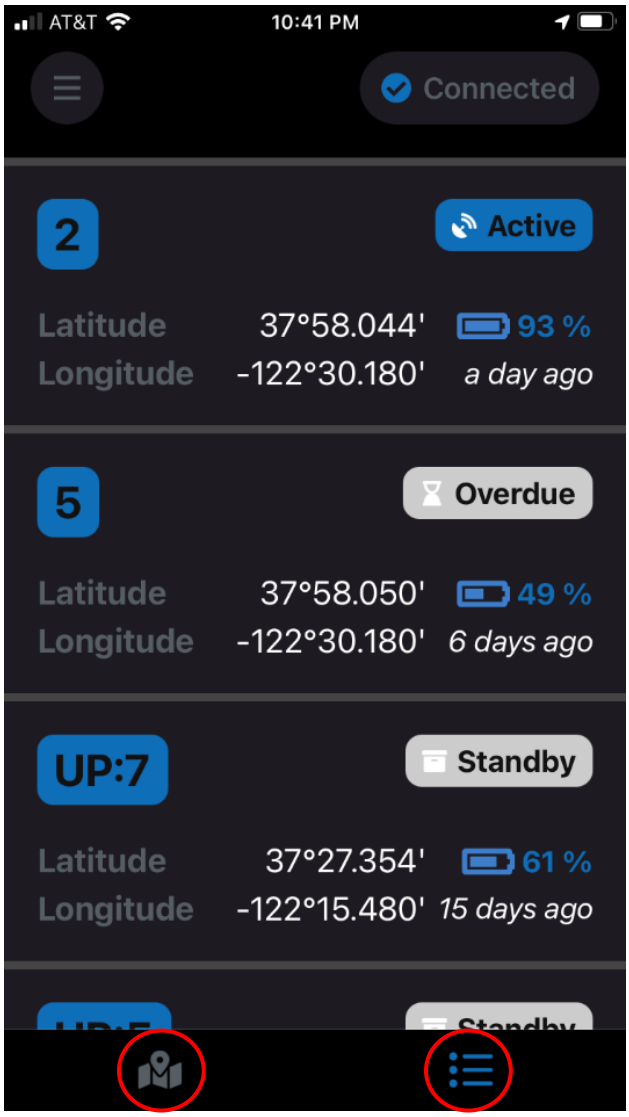
Clicking on the 'Update' in the upper right corner will force an update, otherwise the display will update every 10 seconds.



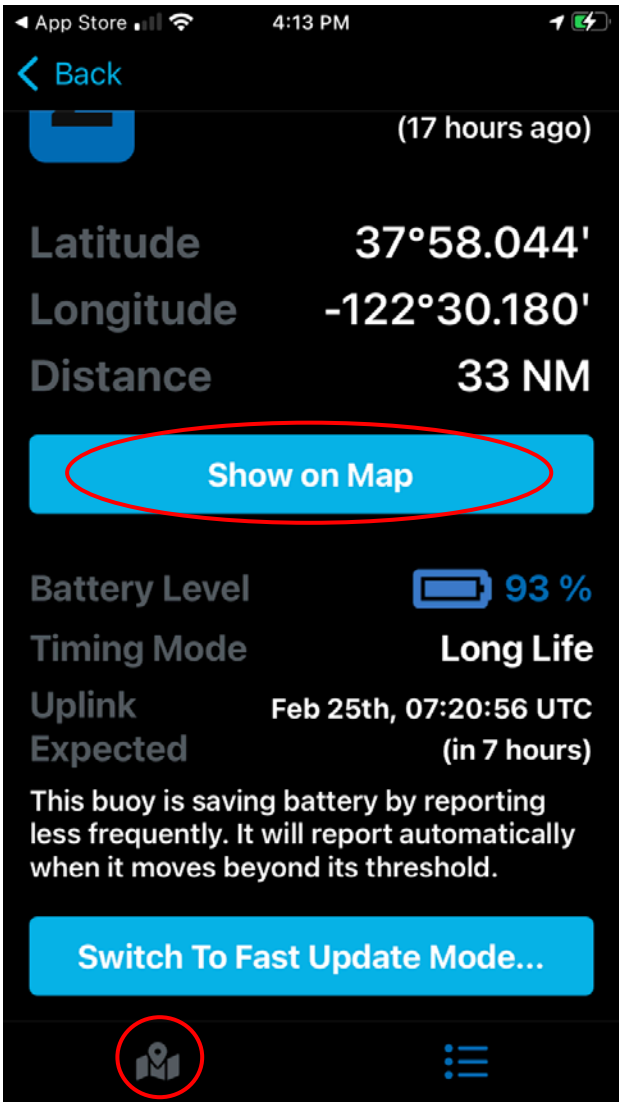
Clicking on the pin will display the buoy ID and its last data transmission time:



Clicking on the icon on the lower right of the app will display a list of all buoy coordinates. Clicking on the lower left of the app will return to the map display.



Clicking on the pop-up box on the map display, or on the buoy in the list view will display the buoy coordinates and distance to the buoy from the user's iPhone:



The user can switch back to the map application by either clicking the 'Show on Map' button, or by clicking on the icon on the lower left.

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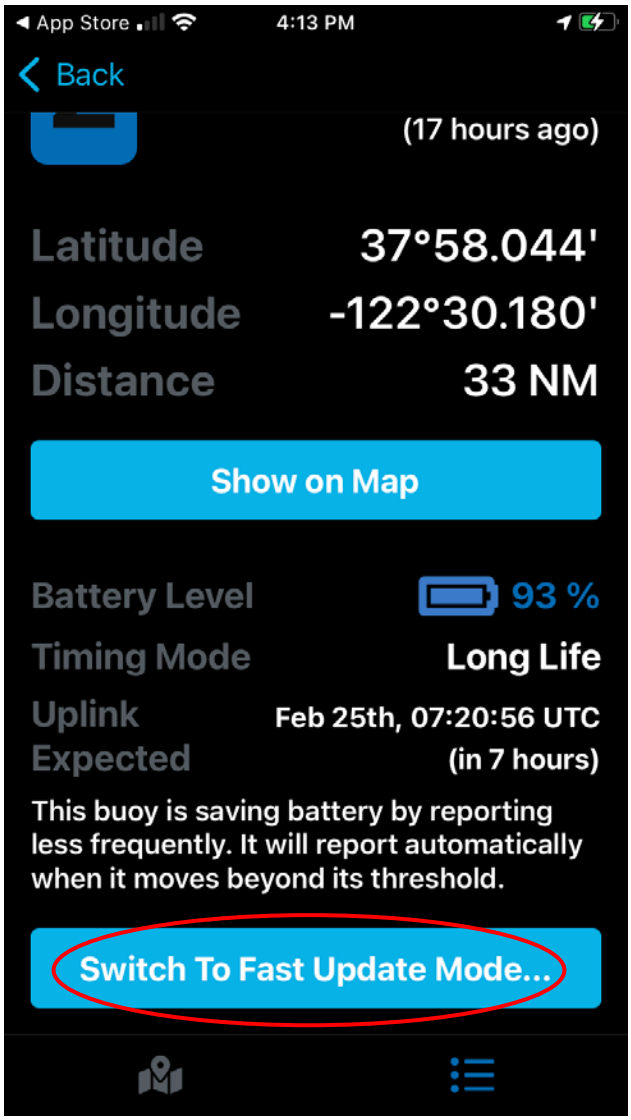
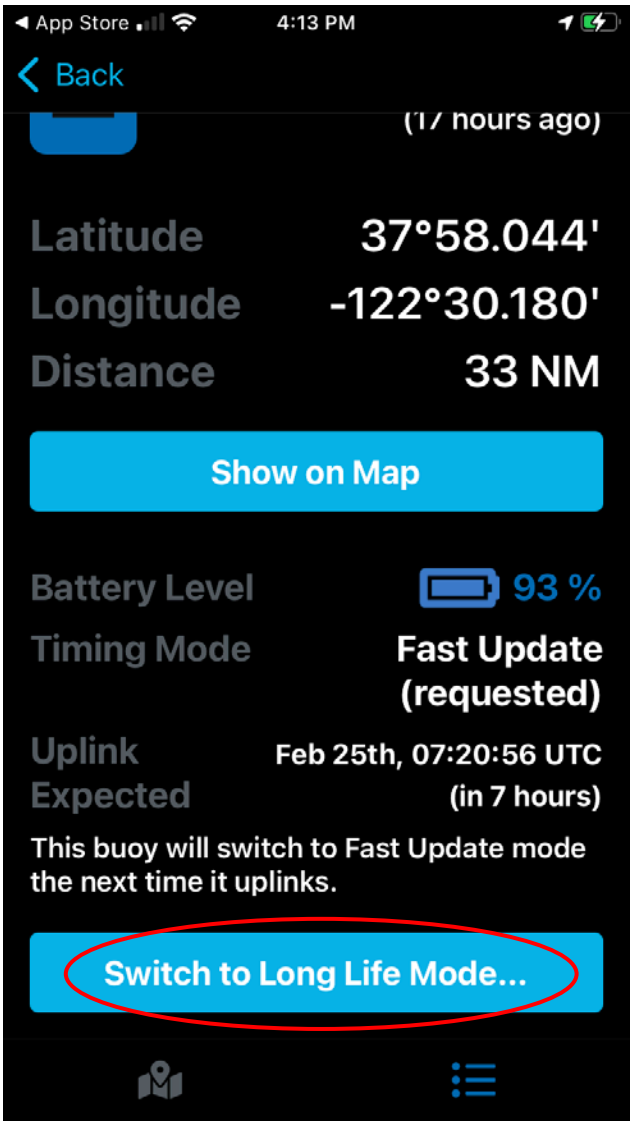
When in Long Life Mode, clicking on the 'Switch to Fast Update Mode' button will switch the Smart Buoy to send data hourly:



When in Fast Update Mode, clicking the 'Switch to Long Life Mode' button will switch the Smart Buoy back to sending data daily:



Blue Ocean Gear Contact Information

If you have any questions about the use of your Smart Buoys please contact:

Kortney Opshaug
kortney.opshaug@blueoceangear.com
(650) 823-1704
Whatsapp: +1-(650) 823-1704

FCC:

FCC ID: 2AZJC-FARALLON

Per 47 CFR §15.105

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- *Reorient or relocate the receiving antenna.*
- *Increase the separation between the equipment and receiver.*
- *Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.*
- *Consult the dealer or an experienced radio/TV technician for help.*

Per 47 CFR §15.19

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Per 47 CFR §15.21

The user's manual or instruction manual for an intentional or unintentional radiator shall caution the user that changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. In cases where the manual is provided only in a form other than paper, such as on a computer disk or over the Internet, the information required by this section may be included in the manual in that alternative form, provided the user can reasonably be expected to have the capability to access information in that form.

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must be at least 20 cm from the user and must not be co-located or operating in conjunction with any other antenna or transmitter.

The information in this guide may change without notice. The manufacturer assumes no responsibility for any errors that may appear in this guide.

ISED:

IC: 27151-FARALLON

[English]

This device complies with Innovation, Science and Economic Development Canada's licence-exempt RSSs. Operation is subject to the following two conditions:

(1) This device may not cause interference; and

(2) This device must accept any interference, including interference that may cause undesired operation of the device.

Radiation Exposure Statement: This equipment complies with the IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20 cm between the radiator and your body.

[French]

Cet appareil est conforme aux flux RSS exemptés de licence d'Innovation, Science et Développement économique Canada. L'opération est soumise aux deux conditions suivantes:

(1) Cet appareil ne doit pas provoquer d'interférence; et

(2) Cet appareil doit accepter toute interférence, y compris les interférences susceptibles de provoquer un fonctionnement indésirable de l'appareil.

Énoncé d'exposition aux rayonnements: Cet équipement est conforme aux limites d'exposition aux rayonnements ioniques RSS-102 Pour un environnement incontrôlé. Cet équipement doit être installé et utilisé avec un Distance minimale de 20 cm entre le radiateur et votre corps.