# Kestrel DROP®

Wireless Environmental Data Loggers

## Getting Started

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# Getting Started with Your Kestrel Drop

Please note: You will need to remove the battery tab prior to using the DROP (see Battery section for opening battery case).


**Please remove tab prior to operation.**

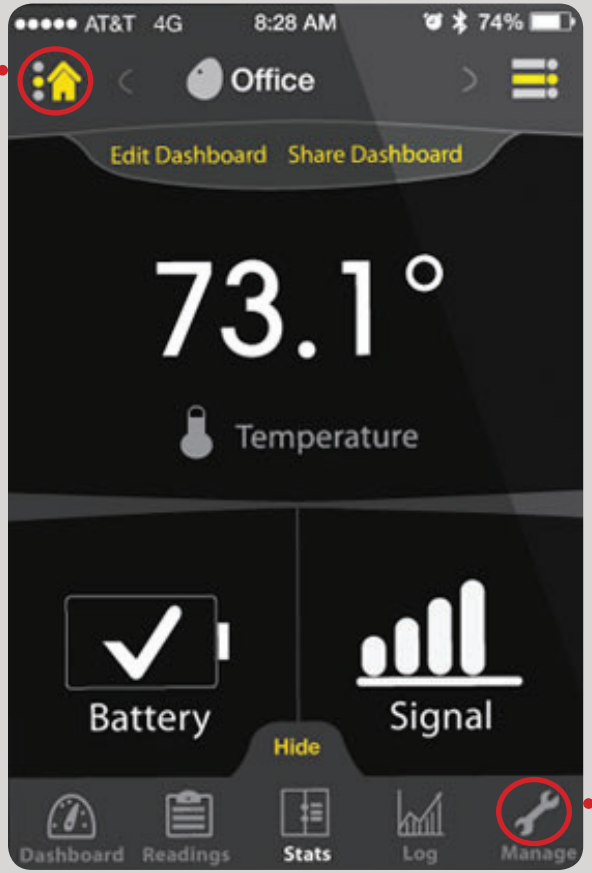
## Overview


*Figure 1: Overview*

# Changing App Settings

**App Preferences**
Adjust settings of application only

- Change Units (Imperical vs Metric)
- Auto Connect Device (Auto vs Manual Connect)
  *NK recommends Auto Connect*
- Manual requires re-pairing each time
  *May be preferred if you have multiple drops*
- Device Power Saving (disconnects if app closed)




**Manage**
Adjust settings of DROP Connection

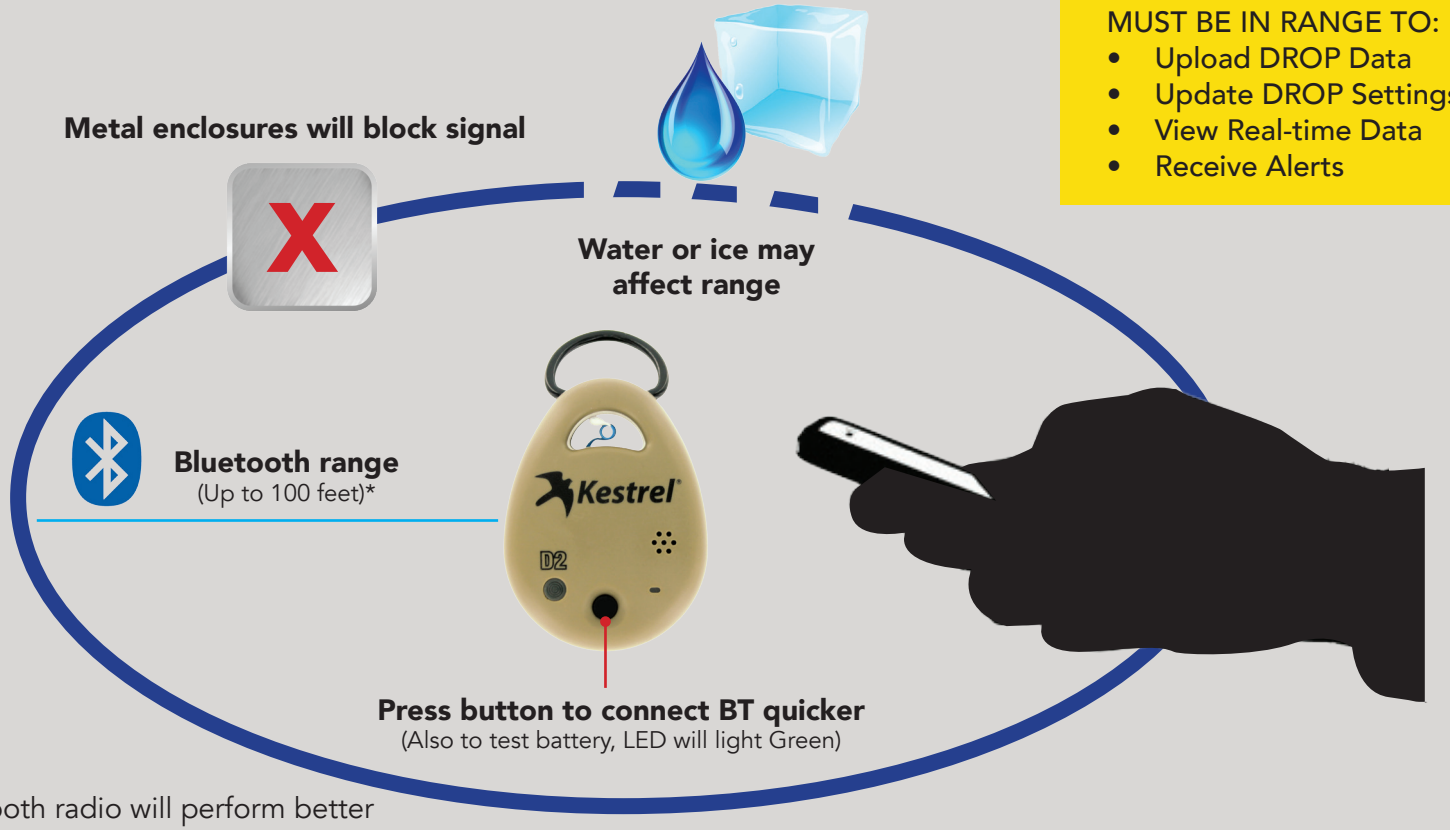
- Update Device Name
- Manage Connection (i.e., Change Refresh Rate)
- Manage Logging (i.e., Change Data Logging Rate)
- Manage Alerts
- Disconnect
- Forget Device
- LED Flash
- Factory Reset
- Device Manual
- Device Info



Please visit www.nkhome.com/kestrel/DROP for more information.

# Connecting to an iOS Device

- Please see: www.nkhome.com/pdfs/Kestrel_Connect_Instructions.pdf
- All data logged by the DROP since your last connection will automatically download to your iOS device upon your next connection.




MUST BE IN RANGE TO:
- Upload DROP Data
- Update DROP Settings
- View Real-time Data
- Receive Alerts

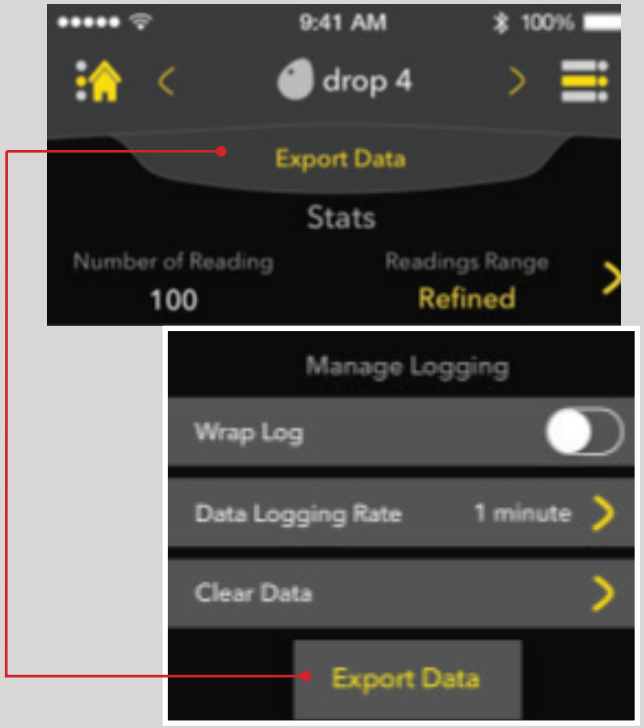
* Bluetooth radio will perform better if the DROP is elevated above ground level.

# Getting Data Logs Off iOS Device

There are two ways to export data off your iOS device:

- Directly from the Stats Page or
- Manage Logging from the Manage Page

You would then export to a valid email address or using AirDrop.



# Battery Replacement

(Please note:  After battery replacement, you MUST reconnect to the Kestrel Connect application to ensure time and date are updated for logging purposes.)


*Figure 2:  Battery Replacement*

| | |
|---|---|
| **If Battery Is Inserted** | Unit is on.  (Only powers off if battery is removed) |
| | Bluetooth is on. |
| | DROP is logging data. |

## LED Indicators

| LED Condition | Status Button | Possible Conditions |
|---|---|---|
|  | Pressed | Unit is functioning normally. |
| | Not Pressed | Battery was inserted.<br>Bluetooth has connected successfully.<br>Bluetooth has disconnected successfully. |

*Note: Status button can be used to immediately send a connection signal to your iOS device.*

# Getting More from Your DROP

**Temperature**

- A slight air flow of 2 mph or more will speed up temperature response times.
- DROP can be used to measure water or snow temperature by submerging the thermistor.

**Humidity**

- For accurate humidity readings, allow the DROP to equilibrate to its environment. Depending on the temperature and humidity differential between environments, this can take between 20 and 90 minutes.
- After submersion in a liquid, humidity readings, if available on your DROP, will be impacted until the humidity sensor area has fully dried. Gently blowing on the sensor area (the small grid of holes in the front case) can speed this process.
- After exposure to temperatures over 80°C, an offset in humidity may be present for a period.

**Connectivity**

- Typical range is 100 ft but longer ranges can be achieved. Metal enclosures, ice, submersion in liquids, obstructed lines-of-site and ground level or non-vertical logging positions will reduce connection range.
- If more than 3-4 DROPs are present, turning off auto connect and manually connecting one at a time will help the app connect successfully. Typically, a maximum of 8 DROPs can be connected to a device at a time.
- The DROP uses Bluetooth Low Energy (BLE) to connect to iOS devices. Android compatibility is coming soon.

**Operating Temperature**

- The DROP will operate without restriction from 14°F/-10°C to 131°F/55°C. Operation at lower temperatures will be limited by the available power and life span of the coin cell battery. Downloading a full data log in temperatures below 14°F/-10°C may tax the battery to the point where the DROP will not operate until the battery has been replaced. For best results below 14°F/-10°C, use a fresh battery, keep data log downloads short (1000 data points or fewer), or allow the DROP to warm to above 14°F/-10°C before connecting or attempting to download logs. The DROP can generally be expected to continue to log data points down to 0°F/-18°C with these limitations.

**Battery Life**

- Cold conditions, frequent logging rates, and frequent log downloads will all shorten battery life.
- When downloading extremely large data logs or making firmware updates, avoid using low batteries and conditions below 32°F/0°C.
- Estimated battery life at the baseline settings programmed into your DROP when shipped from the factory (10 min logging rate, 5 sec connection rate) and room temperature (77°F/25°C) is about 4 months. Intensive logging and connection settings (2 sec logging rate, constant connection) can reduce battery life to as little as 11 days.

# Glossary of Measurements

**Wet Bulb:** The lowest temperature in the ambient atmosphere yielded by evaporating water from a wet muslin-covered bulb of a thermometer.

**Absolute/Station Pressure:** The actual measured pressure of the weight of air above the measurement point. Often called station pressure.

**Density Altitude:** The equivalent altitude in the ICAO standard reference atmosphere for the measured temperature, relative humidity and air pressure. A measure used primarily by pilots, high-performance engine mechanics and long-range shooters.

**Heat Stress Index:** A measurement of the air temperature in relation to the relative humidity, used as an indicator of the perceived temperature.

**Relative Humidity:** The ratio of the amount of water vapor in the air at a specific temperature to the maximum amount that the air could hold at that temperature, expressed as a percentage. Relative humidity is a function of temperature and therefore changes as the temperature changes, even if the amount of moisture in the air remains constant.

**Dewpoint:** The temperature at which the water vapor in the atmosphere begins to condense. Any further cooling causes condensation (fog and dew). This is also the temperature of saturation at which the dry-bulb, wet-bulb and dew-point temperatures are all the same.

**Temperature (Air/Water/Snow):** Air temperature is the ambient temperature of the air and water vapor as measured by a thermometer or other measuring device in which the thermal element is dry and shielded from radiation. Water and snow temperature are measured with a measuring device in direct contact with the environment. Available units are Fahrenheit – a temperature scale where water at sea level has a freezing point of +32° F°, and a boiling point of +212° F; and Celsius – a temperature scale where water at sea level has a freezing point of 0° C and a boiling point of +100° C.

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