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.

Please remove tab prior to operation.

Note: Tab can be removed without opening battery door.

Overview

Temperature Sensor

Humidity Sensor (D2 and D3 only)

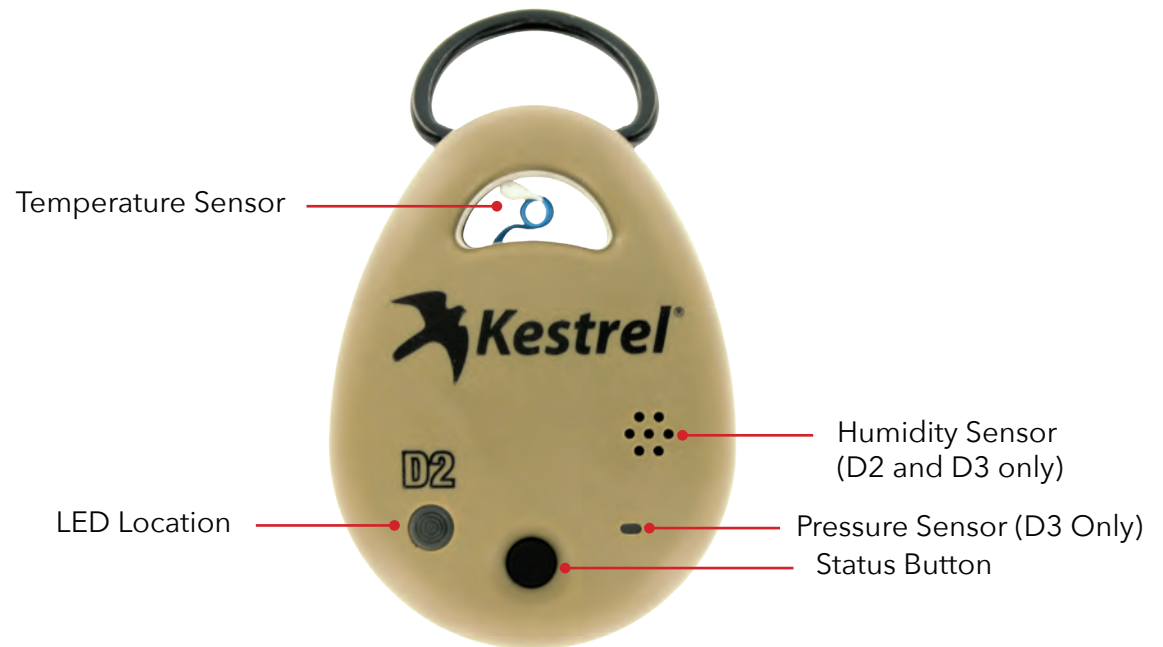LED Location
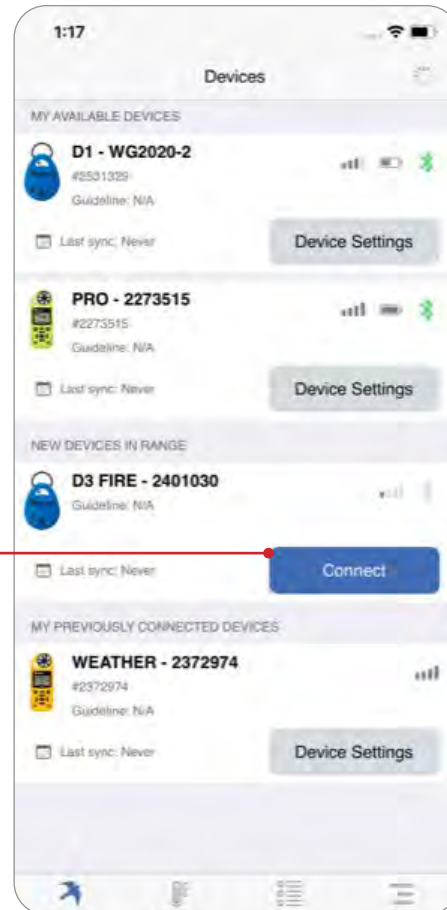
Pressure Sensor (D3 Only)

Status Button

Figure 1: Overview

Connecting your DROP to the Kestrel LiNK Application

Please note: You must connect the DROP to our Kestrel LiNK application PRIOR to using it in the field to ensure the date and time are updated on the DROP and the settings are correct.

- To begin, download Kestrel LiNK for Android or iOS from the Play Store (icon shown).

- Make sure Bluetooth is enabled on the mobile device you are using.

- Open the Kestrel LiNK app and when your device appears, select the Connect button.

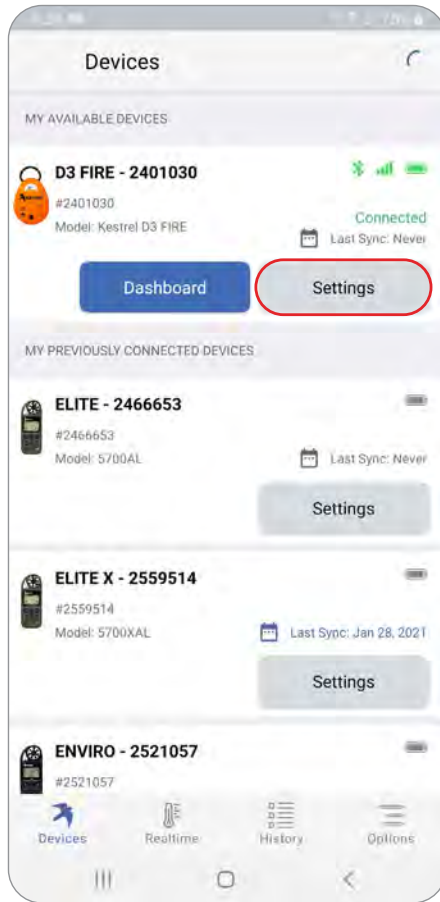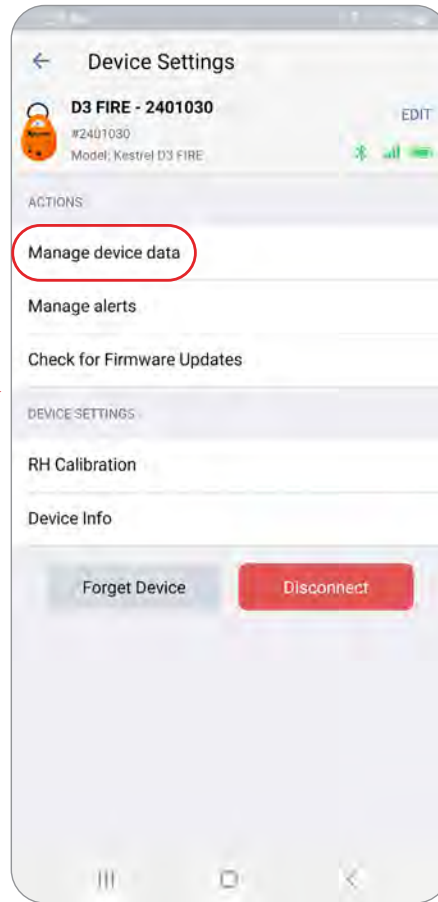# Connecting your DROP to the Kestrel LiNK Application
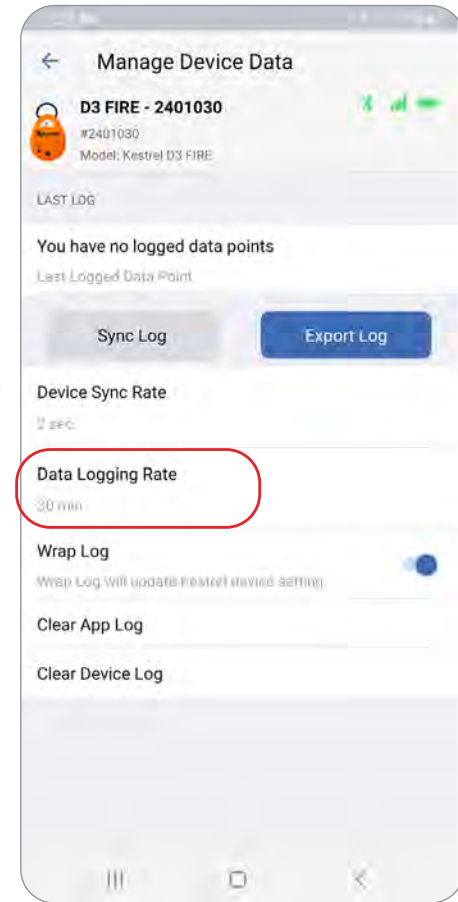
Please note: You must connect the DROP to our Kestrel LiNK application PRIOR to using it in the field to ensure the date and time are updated on the DROP and the settings are correct.

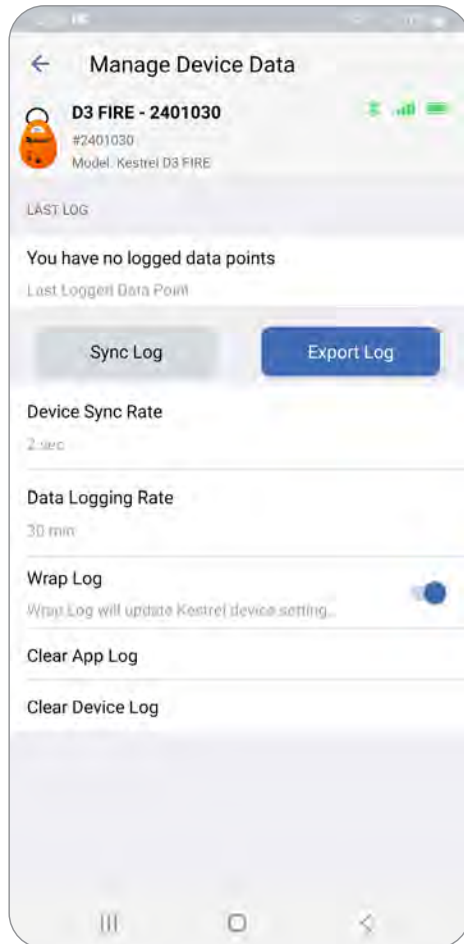From the Devices screen, select the Settings button.

Navigate to the Manage Device Data Screen.

Here you can set the Data Logging Rate on the DROP. Time and Date are updated upon connecting.

Uploading and Exporting your Data

From Manage Device Data Screen:

- Press Sync Log to manually upload all the data on the DROP.

- Press Export Log to export the data log as a CSV file.

- You can view and export all saved data on the History tab.

More Information

For detailed instructions of all the features of the Kestrel LiNK App, please review our Kestrel LiNK instructions found here: https://kestrelinstruments.com/mwdownloads/download/link/id/1083/

Using Your Kestrel DROP

- As soon as the battery supplies power to the DROP, it begins logging data. Battery life will depend on logging rate, amount of time connected to Kestrel LiNK app and ambient temperature. The only way to stop a DROP from logging is to remove the battery.
- The DROP will log at the default of once per hour unless the user changes the logging rate with the Kestrel LiNK app.
- The DROP will continue logging until the memory is full or if "wrap log" is enabled, it will log until the battery runs out.
- Status Button and LED functions: status button will promote a DROP to the top of the devices list in the LiNK app. "Beacon Mode" on the app will cause the LED to blink.
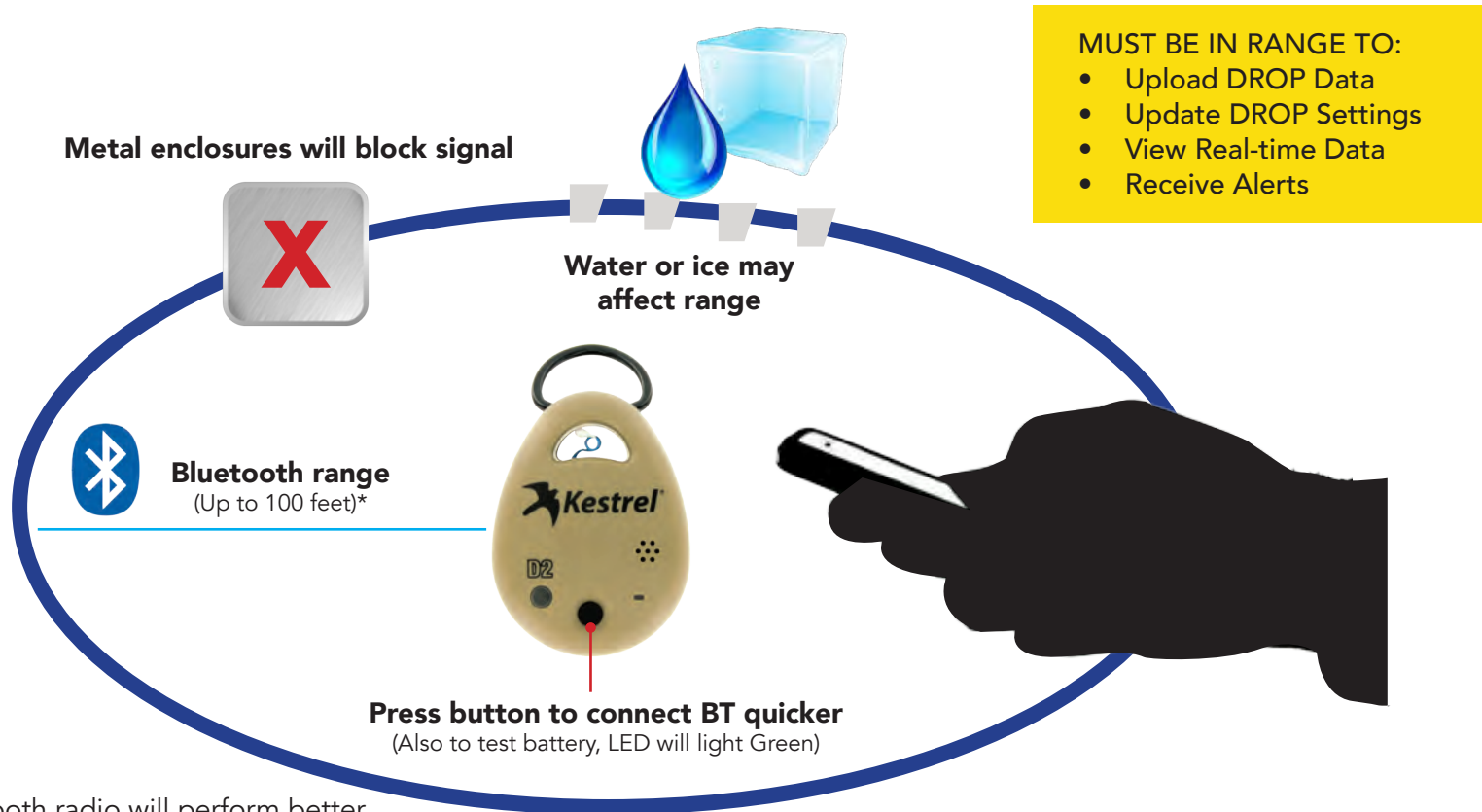
If Battery Is Inserted	Unit is on. (Only powers off if battery is removed)
	Bluetooth is on.
	DROP is logging data.

LED Indicators

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

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

DROP Connection Guidance

Metal enclosures will block signal

X

Water or ice may affect range

Bluetooth range
(Up to 100 feet)*

Kestrel

D2

Press button to connect BT quicker
(Also to test battery, LED will light Green)

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

Battery Replacement

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

Figure 2: Battery Replacement

Note: Please inspect the o-ring when opening battery door and ensuring it is clean before replacing door. Also ensure it is properly aligned when closing battery door.

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.

- DROP can withstand being in 1 meter of water for up to 30 minutes.

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.

  Note: Users can use the graph in the Kestrel LiNK app to monitor when the humidity reaches equilibrium as the humidity graph will trend flat when it reaches this point.

- 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/176°F, 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 devices.

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

WB **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.

D **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.

HI **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.

DP **Dew Point:** 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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