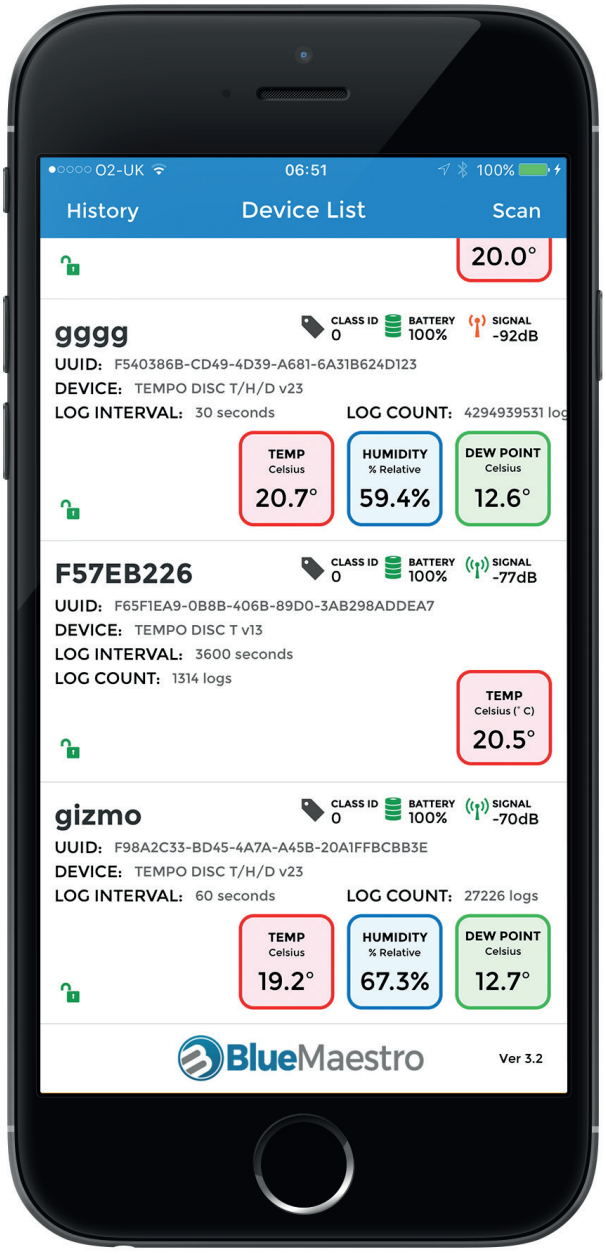
TEMPERATURE, HUMIDITY & DEW POINT BLUETOOTH SENSOR AND LOGGER

USER GUIDE



Version 1.20
October 2017

BlueMaestro

FCC COMPLIANCE STATEMENT

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.

CAUTION: Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

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.

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User assumes responsibility for correct operation of the product and any software associated with it. User assumes responsibility for determining the suitability of the product to the user's needs, for configuring and using the product to meet those needs, and for the proper placement/location of the product in the environment it is being used. User assumes responsibility for verifying and interpreting results obtained from product use.

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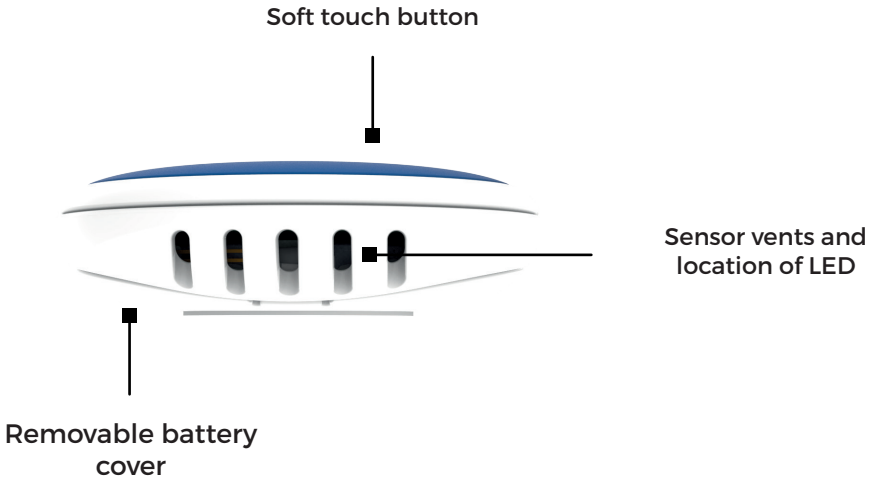
1. Quick start

1.1 Download the free iOS or Android App: Tempo Utility App

To get the links to the latest apps, please visit www.bluemaestro.com/support

1.2 Turning the Device on

The soft touch colour rubber on top of the Device is a button. Depress gently to turn it on. The LED indicator will blink three times when it is turned on. The LED indicator will blink once if it is already on. Please note it should not be depressed with excessive force, since this may damage the Device. When the Device is turned on it will immediately begin logging temperature, humidity and dew point.



1.3 Turning the Device off

The Device can be turned by depressing the button and holding it down for a period of 5 seconds. It will blink rapidly to indicate it is turning off.

1.4 Changing the battery

When the time comes, the battery can be changed by removing the two small philips 00 screws and removing the back battery cover. The Device takes a coin cell CR2032. It should be inserted so that the + side is facing outwards. The back battery cover may have small padding elements on the inside of it. If this is the case, ensure the padding elements remain in place when putting the battery cover back on. You will know when the battery is properly inserted since it will blink three times and then once every time the button is pushed. If the Device blinks three times every time the button is pushed this is an indication the battery is not making a good connection with the battery connectors and will need to be reseated.

1.5 Automated test mode

A feature of the Device is its automated test mode ("Test Mode") . This will put the Device into test settings that can allow the accuracy and reliability of the Device to be tested without having to manually set up the Device in the app. Test Mode can be entered into by pressing the button 3 times in quick succession. On entering Test Mode the device will blink slowly 5 times.

In Test Mode:

1. The Device name will have a "T" and the start and end of its MAC address name

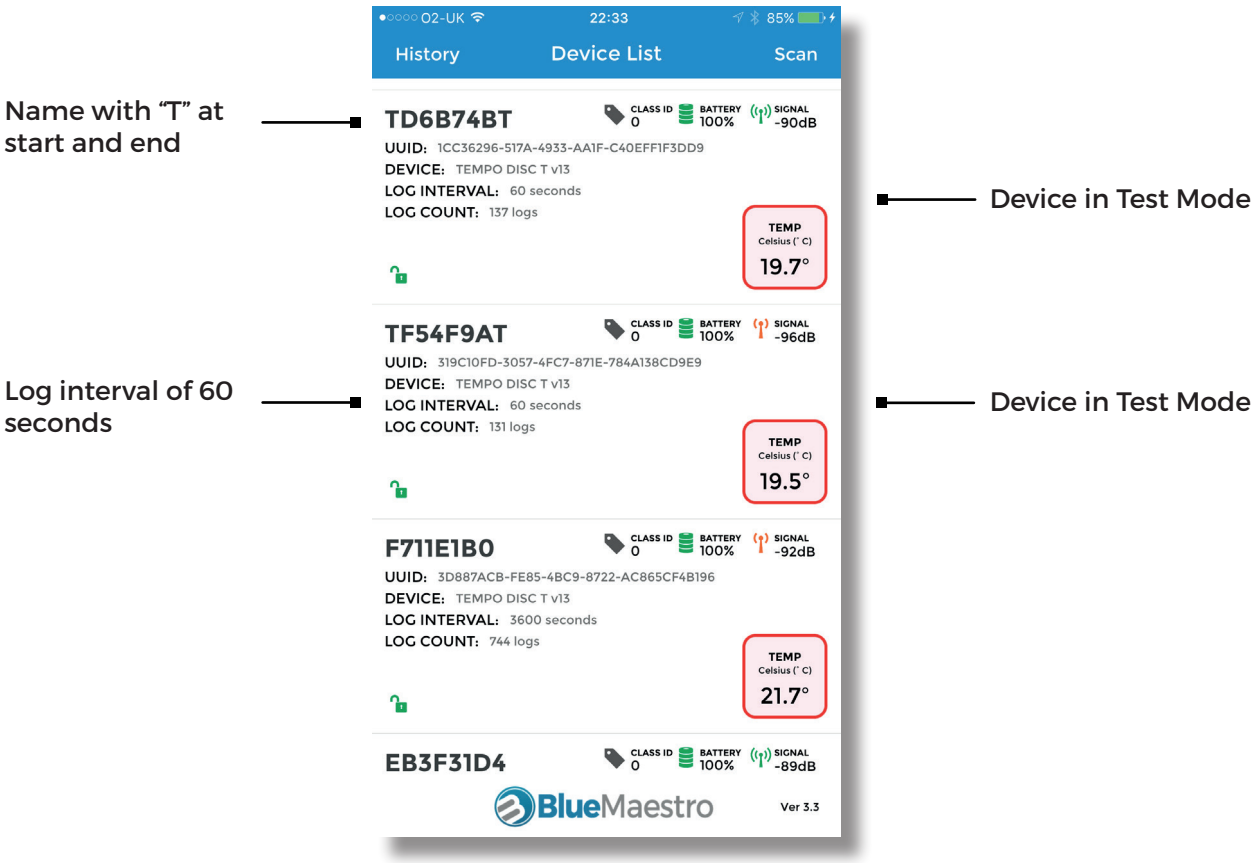
2. The Device's logging interval will be set to 60 seconds

3. Any previous data prior to entering Test Mode will be deleteted

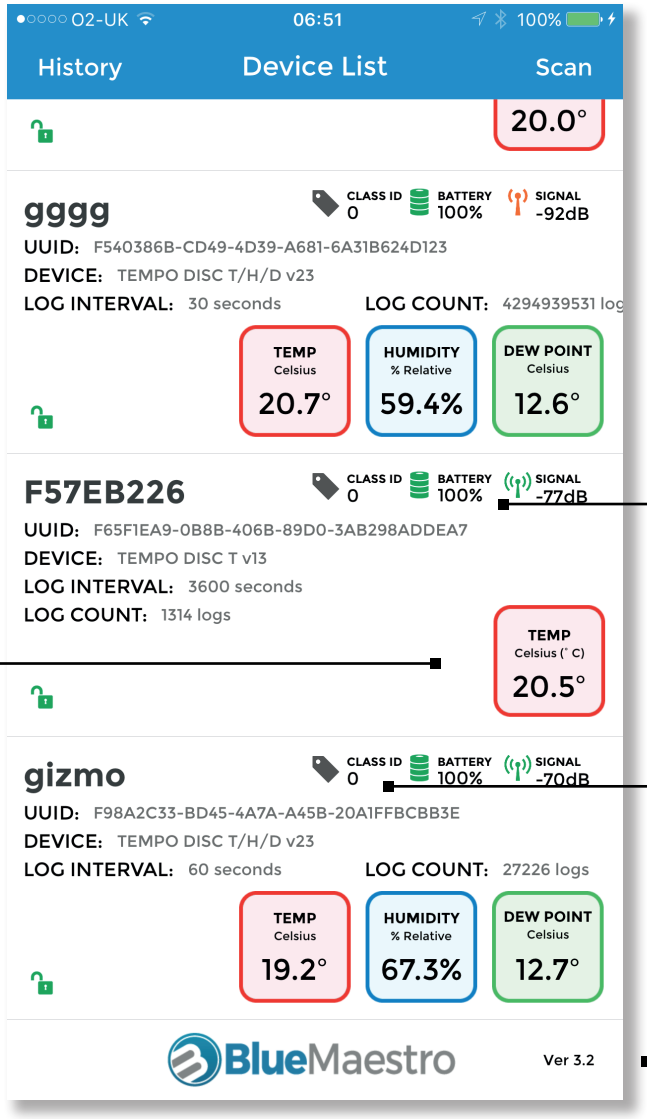
4. After 24 hours continuous operations the Device will blink to indicate that it has logged 24 hours of data

5. The data can be viewed/downloaded as normal

6. On pressing the button three times again, the Deviec will be taken out of Test Mode.



2. Features of the iOS app

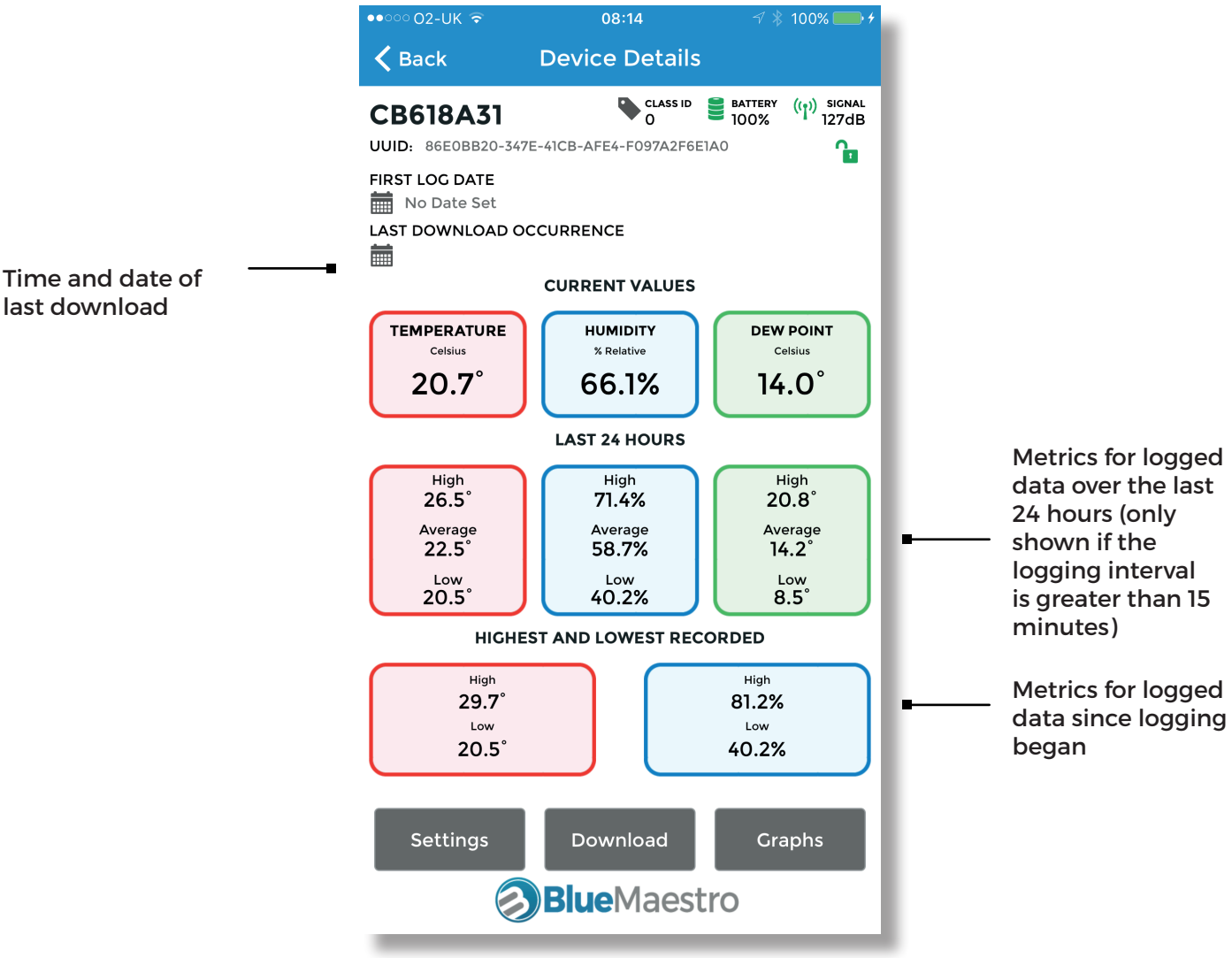


The Device List screen will list all Blue Maestro Bluetooth Devices within range. It will also show key values for the Devices, such as radio strength, current values, logging interval and how many logs the Device holds.

When a Device's button is pressed, the background of the Device cell in the Device List will turn grey for approximately 10 seconds. The Class ID will also become 255 during this time. This feature is designed to enable a Device to be identified in the app physically.

If a Device's cell is left swiped, it will expose a button "blink" that if pressed will cause the LED on the Device to blink. This feature is designed to enable the Device to be identified from inside the app.

The battery level is in % of volts. 100% means voltage is approximately 3 volts. The battery will need to be changed if the voltage drops below 2 volts or approximately 70%. As a safety precaution to prevent the RAM of the Device from being corrupted, if the battery drops below 70% the Device will power down until the battery is replaced.



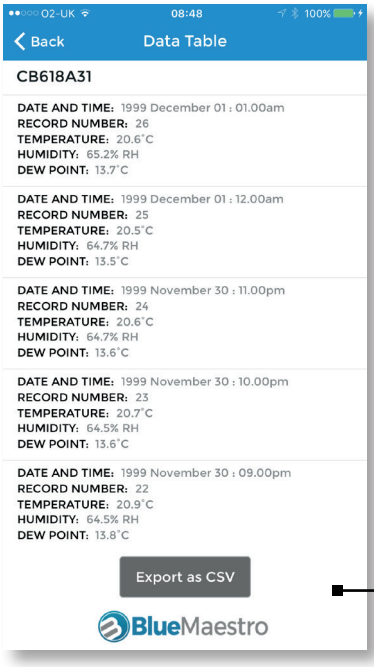
The Device Details screen will provide further information in relation to a particular Device. The Current Values are the current readings of the sensors. The historic metrics are derived from logged data. It may be that the Current Values appear to exceed or be lower than historic metrics simply because the Current Values are only logged every Logging Interval.

The First Log Date is the same as the Reference Date and is the time and date of the first log. This then sets the timestamp reference for each and every logged value stored in the Device. If there is no Reference Date then on a Download the app will try to work out the Reference Date but this can be inaccurate. It is advisable that a User sets the Reference Date as a first step in setting up the Device. IMPORTANT: Changing the Reference Date will cause stored sensor data to be deleted and logging to restart.

Back to Device Details screen

Scrollable, pinchable and zoomable graph

A pdf image of the graph can be exported to a chosen email address

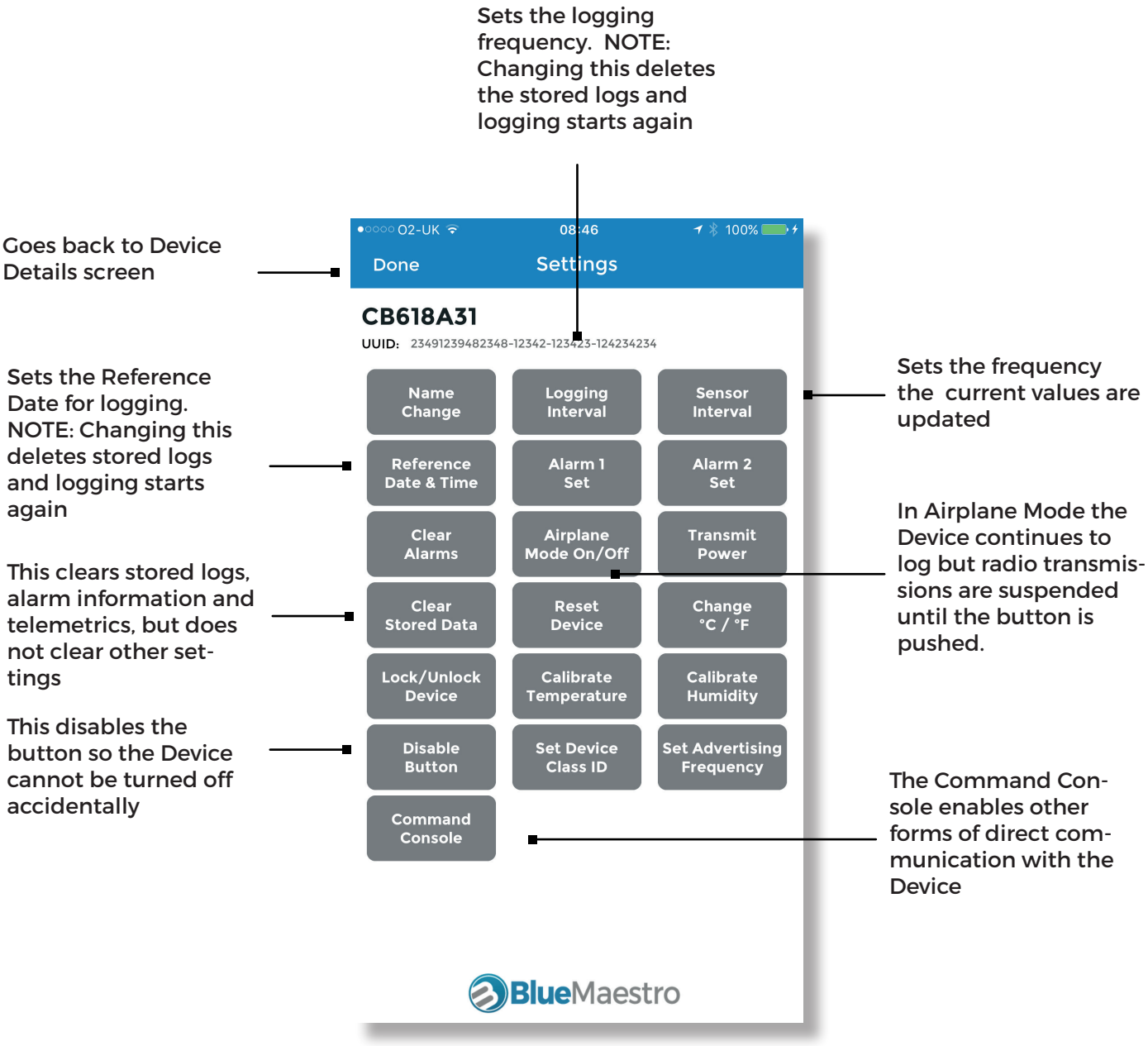


Data can be displayed in a table showing the timestamp and value of each log

Data can be exported as an .CSV spreadsheet that can be opened in Excel to a chosen email address

Once data has been downloaded from the Device into the iOS smartphone or tablet, the logged data can be graphed or viewed as a table. Both the graphs and the data table can be exported directly from the iOS smartphone or tablet via email to an email address.

3. Commands of the iOS app



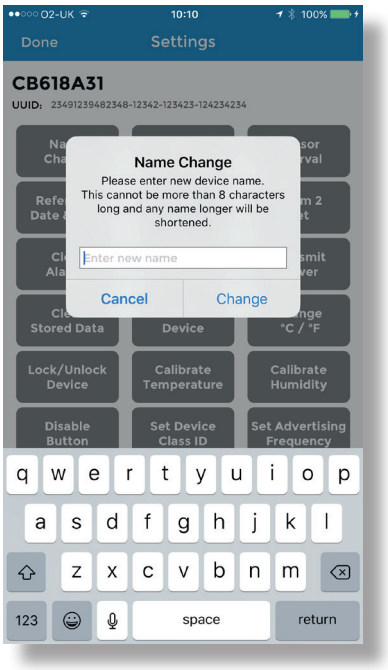
Each of these commands will be explained more fully in the following sections.

3.1 Name Change

Name Change

The default name of the Device is the first 8 digits of its MAC address, which can also be found on a sticker on the back cover of the Device. This can be changed to any other name not exceeding 8 characters in length. Any characters in excess of the 8 limit will be omitted.

The Device's name will appear in the advertisement packet of the Device itself. That is to say the name is not local to the iOS smartphone/tablet, it is actually embedded in the Device and will be seen by all users.



3.2 Logging Interval

Logging Interval

The logging interval determines the frequency of logging. The minimum value is 60 seconds (or 1 minute) and the maximum value is 24 hours. The value should be entered in as seconds.

Changing the logging interval deletes any stored logs and logging restarts. This is due to any change in the logging interval potentially compromising the integrity of the timestamps for the logs since the timestamps are calculated on the assumption each log has the same time interval from the Reference Date.

3.3 Sensor Interval

Sensor Interval

This sets the frequency the sensor is polled for displaying the current sensor readings. It does not affect the Logging Interval. Changing this does not delete any stored logs. The default is 20 seconds.

NOTE: Shortening the sensor interval can have a negative impact on battery life.

3.4 Reference Date

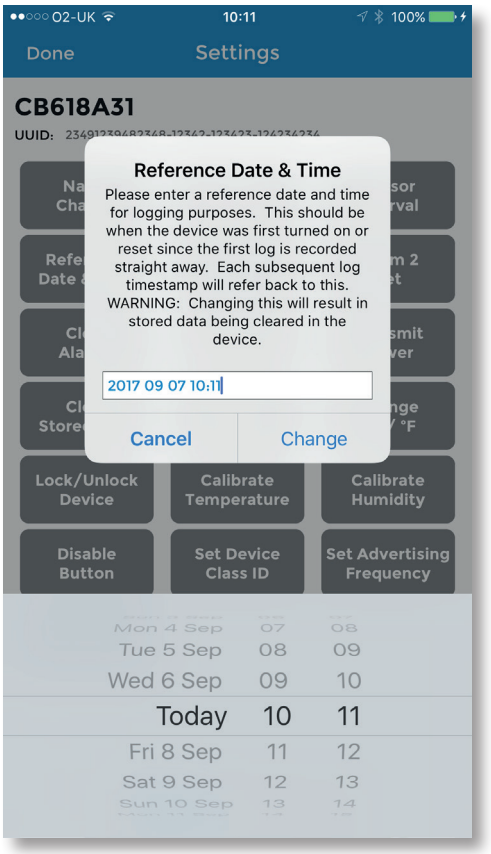
Reference Date & Time

The Device uses a real time clock to log each reading at the Logging Interval. The Reference Date and Time is the time and date of the first log which is then used to calculate the time and date of each subsequent log. Reference Date and Time is entered as a 10 digit number and represents the time of the first log to the minute.

For example to enter 11.42pm on Thursday 7 September 2017 the 10 digit number would be: 1709072342.

It is advisable when setting up the Device for a logging task, one of the first steps is to set the Reference Date and Time.

NOTE: Changing the Reference Date and Time will delete the stored data and logging will begin again.



In the iOS App the Reference Date and Time able to be entered in a more user friendly format than typing in 10 digits since the app will convert the current date and time into the 10 digit number for you

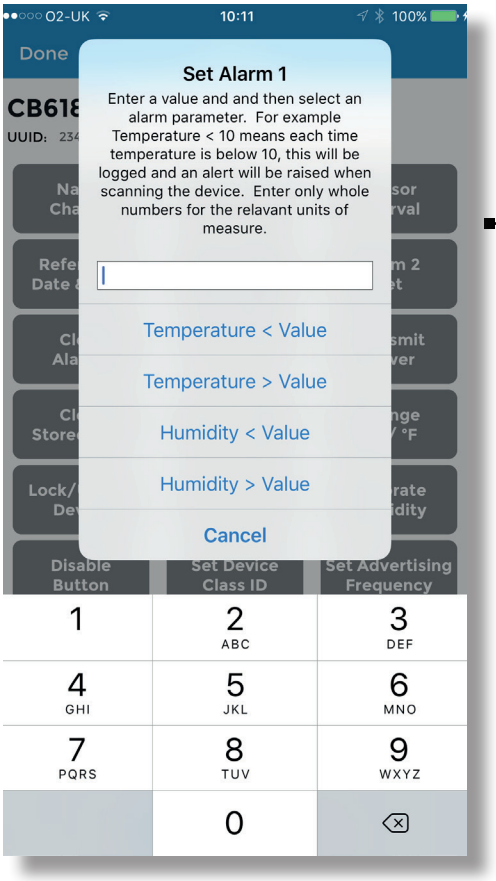
3.5 Alarm 1 Set and Alarm 2 Set

The Device is able to keep track of temperature or threshold breaches in real time by a user setting either or both Alarm 1 and Alarm 2.

If either or both of these alarms are set, at each Logging Interval if the temperature or humidity being logged breaches any of the alarms a flag is raised in the advertisement packets being transmitted by the Device and when the Device is scanned by the app a red triangle with a number next to it representing the count of how many times the temperature or humidity has breached the set values will appear in the Device List screen.

The breach count maximum is 255, and any further breaches beyond this number will not be counted.

The alarms are set by entering the threshold number as a whole unit (no decimal points) in the relevant units of measure then selecting whether the breach will occur if the metric is above or below this number.



Enter the threshold number FIRST before selecting whether the threshold is > or < than. This number is a whole number (no decimal points).

If this is left blank then the relevant alarm will be turned off

NOTE: The alarms apply on a forward logging basis only. That is to say that if an alarm is set and there is already logged data breaching the alarm stored in the Device, there will be no warning indicator shown.

3.6 Clear Alarms

This will clear the alarms and turn them off.

3.7 Airplane Mode

To comply with U.S. FAA and international carrier regulations, the Devices have an Airplane Mode that will allow them to continue logging but prevent them from radio transmitting. This works by toggling Airplane Mode On or Off.

When Airplane Mode is On the Device will continue transmitting for 60 seconds and will then go to sleep but will continue to log data and keep track of alarm information and telemetrics. If the Device's button is pushed during this time the Device will transmit for 60 seconds before going back to sleep. To take the Device out of Airplane Mode it is necessary to cause the Device to transmit since the app is unable to communicate with the Device if its radio is asleep.

Not only does Airplane Mode allow the Device to continue logging while in flight, Airplane Mode can also be set when it is necessary or desirable to extend the battery life of the Device on long journeys (such as when logging sea journeys). In Airplane Mode the Device consumes substantially less power since the radio consumes most of the power of the Device. Therefore if it is not necessary for the Device to continuously transmit consider putting it in Airplane Mode to conserve battery.

TIP: Airplane Mode can extend the battery life of the Device and over 2 years of logging is possible with just a CR2032 coin cell. Consider putting the Device in Airplane Mode if it is not necessary for the Device to continuously transmit.

3.8 Transmit Power

This allows the transmission power of the Device to be changed to conserve battery life. The default setting is +4dB which is the maximum. Choose from one of the other settings (either 0dB and -4dB). Please note reducing the transmission power can affect the operational range of the Device.

3.9 Clear Stored Data

This clears any stored logs, the alarms and any telemetric data stored in the Device. It does not change other settings such as the Name, Reference Date and Time and the Logging Interval.

3.10 Reset Device

This performs a factory reset of the Device and is the same as a long button push performed on the Device itself.

3.11 Change °C/°F

This changes to the units of measure for temperature and dew point in the Device. Any other user of the Device will also see the units of measure change.

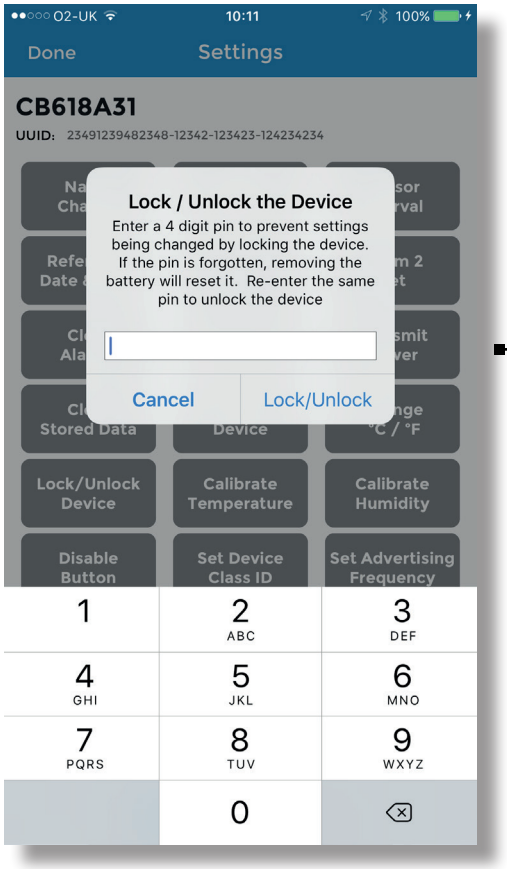
3.12 Lock/Unlock Device

The Device can be locked by apply a 4 digit pin. This may be necessary or desirable where the Device is able to be accessed by third parties who may have sufficient knowledge to be able to change settings within the Device or delete stored data. By locking the Device, the Device will not respond to any commands until the 4 digit pin is entered again.

When the Device is locked a small red locked padlock image will appear in the Device List and Device Details screen.

To unlock the Device re-enter the 4 digit pin. To lock the Device once more enter a 4 digit pin again.

NOTE: Do not lose or forget the pin since it will not be possible to unlock the Device unless a full reset of the Device occurs.



Enter a 4 digit pin to lock the Device. Enter the same 4 digit pin to unlock the Device

3.13 Calibrate Temperature/Calibrate Humidity

It is possible to enter a calibration offset within the Device for either or both of temperature and humidity. Enter the offset (adding - if the offset is a negative number) and pressing Enter.

The Device carries its calibration so every user of the Device will see the calibrated values. On a reset of the Device any calibration values are reduced to zero and are effectively removed.

3.14 Disable Button

The Disable Button feature ensures the Device cannot be accidentally rest by a long button push. This may be necessary or desirable with the Device can be physically reached by third parties or there is a risk of pressure being exerted on the Device.

3.15 Set Class ID

This enables a Device to be set with a Class ID representing a number between 0 and 254. This can be used for identifying groups of Devices where the Device name is not sufficient to identify which group a Device belongs to.

When the Device's button is pushed, or it is powered up such as on a change of battery, the Class ID will temporarily become 255 and the cell of the Device in the Device List will turn grey. This enables the Device to be easily identified in the app by pressing its button.

3.16 Set Advertising Frequency

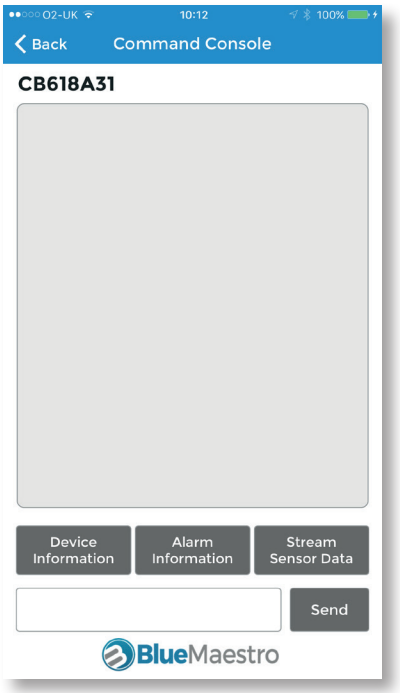
A Device's advertising (radio transmission) frequency can be changed to extend the battery life or to make the Device more responsive to commands.

NOTE: Shortening a Device's advertising frequency can have a detrimental affect on its battery life.

3.17 Command Console

Command Console

The Command Console provides a method of issuing commands and extracting further information directly from the Device. Please refer to the relevant API and Command Guide for a list of commands that can be issued directly to the Device.

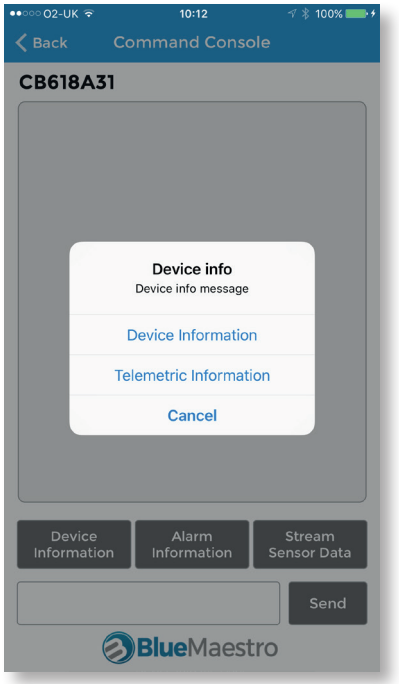


Output area for feedback from the Device

Device Information/ Alarm Information can be obtained directly from the Device

It is possible to put the Device into streaming mode for 30 seconds

Area for inputting commands



When selecting Device Information, you can further select Device or Telemetric Information. This will display things like Memory Size, Firmware Version Number, Run Time, averages, highs and lows etc.

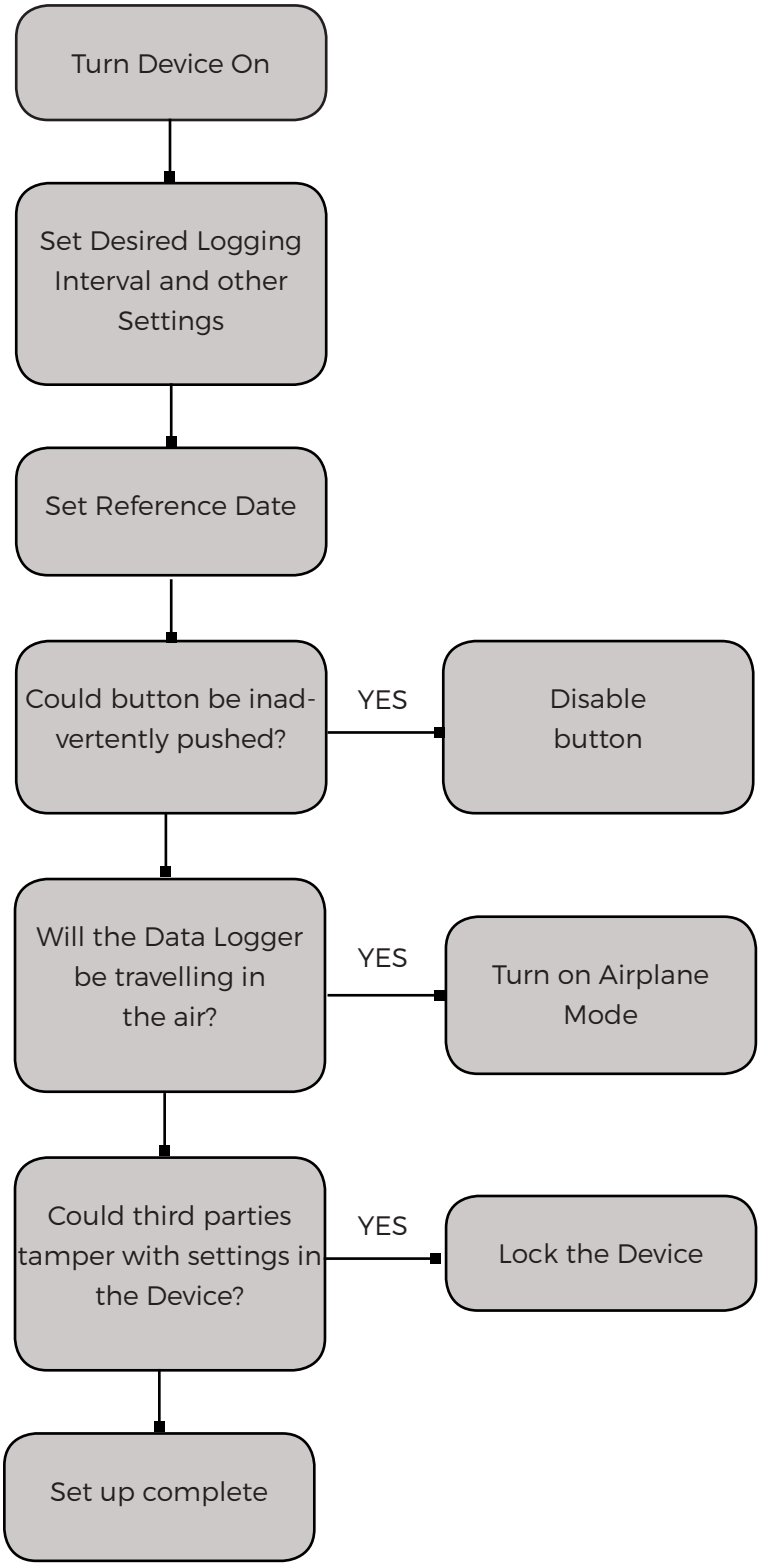
3. Process for setting up the Device

Logging commences from now

A long button push could reset the Device, consider disabling the button if this could happen inadvertently

If accompanying air cargo put the logger into airplane mode. To interact with the Device push the button to cause the Device to temporarily advertise (Note disabling the button does not prevent a button push causing the Device to advertise in airplane mode).

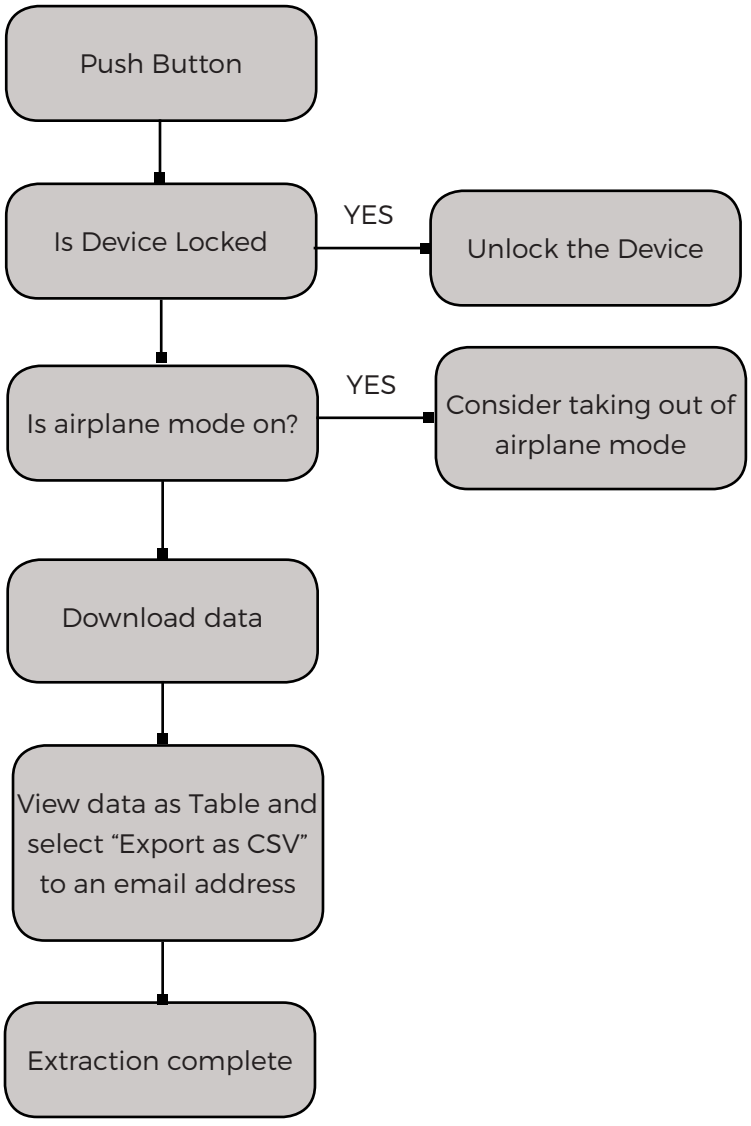
If third parties could tamper with settings or delete the Device, lock the Device.



4. Process for extracting data from the Device

Does the device blink once? If so Device is operational. If not then either LED has been turned off or battery is flat and will need to be changed before data can be extracted

If the device is locked, it will not be possible to extract logged data, therefore it needs to be unlocked first



If button has been disabled consider enabling it so the device can be turned off to save battery after its logging job