Lafayette Instrument ®

LEval with VertiMetric for Android™
User's Manual

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Introduction

Thank you for downloading the Lafayette Evaluation (LEval) app. The LEval app allows users to connect an IOS or Android device to specific Lafayette Instrument products. One of these products is the Model 01111S VertiMetric. The LEval app allows VertiMetric users to manage test batteries, subjects, and results.

Under no circumstances should the VertiMetric device be disassembled. In cases where disassembly is found, device warranty will be void.

Device Specifications

- Communication: Bluetooth 4.0, USB 2.0
- Battery: LI-42B Li-Ion 3.7V 740mAh
- Battery Life: 14 hours (on)
- Auto Shut-off: After 3 minutes without Bluetooth connection
- Power Consumption: 1/4 Watt
- Resolution of +/- 1 inch
- Weight: 57 grams (.13 lbs.)
- Dimensions: 2.73" X 2.13" X .71"

Device Power

Powering On the Device

Press Power button until Green LED on device begins to flash (approx. 1/2 second).

- Green LED Flashing (1Hz): Device power on, tablet disconnected
- Green LED Steady: Device power on, tablet connected

Powering Off the Device

Press Power button until green light shuts off (approx. 3 seconds).

The Device will also power of after 3 minutes of not being connected via Bluetooth.

Charging the Device

The device has a battery life of 14 hours while powered on, and it requires approximately 1 hour to fully charge the battery from being completely discharged (using the provided AC adaptor). The LED on the device will glow Red when charging, and the LED will flash Green at 8Hz frequency when complete. Once the device's battery has been fully discharged, it is necessary to charge via the provided charging cable before additional use. Do NOT attempt a Jump Sequence while the device is connected to the charging cable.

Charge Times
- Supplied AC Wall Adapter (800mA charge current): 1 hour*
- Computer USB port (Enumerated 450mA charge current): 2 hours
- Computer USB port (Un-enumerated 100mA charge current): 4 hours

* Only use supplied AC adapter when charging device from an AC source.

Device Strap Attachment

Note: Ankle selection (left or right) does not affect the results of the device.

Step 1

With the soft side to the subject's skin, wrap one of the long Velcro straps as low as possible on the ankle tightly without causing discomfort or impeding the subject's jump movement. The strap must be tight enough to remain stationary during the jump sequence.

Step 2

Attach the device to the wrapped velcro strap without tugging on the plastic loops on the sensor. Repeatedly tugging on the sensor loops will cause damage.

Proper Jump Protocol

Before attempting a jump, ensure the test subject has stretched and warmed up his or her body to prevent physical injury. If there is any doubt of the subject being able to complete a jump, please consult a physician.

A proper jump consists of the following protocol:
- Start with feet shoulder width apart.
- Bend at the knees with the hips and ankles flexed and arms at their sides.
- Propel your body up with your legs springing off the balls of your feet and swinging your hands toward the ceiling.
- Leave the ground with both feet at approximately the same time.
- When in the air, keep legs in a natural position. Legs must not be tucked up in order to increase time in the air.
- Feet must return to the ground at approximately the same time.
- Cushion landing by bending at the joints and landing on the balls of your feet and rolling back onto your heels to avoid personal injury.

If the previous protocol is not followed by the test subject, the results should be considered invalid.
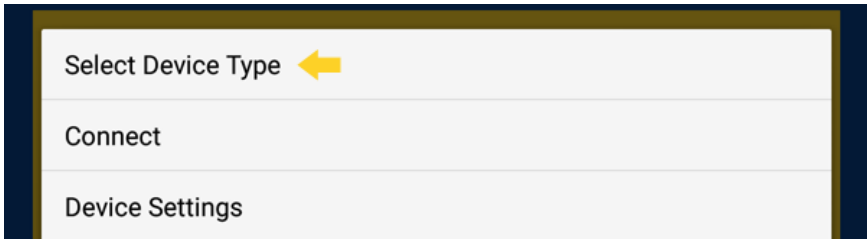
Device Warnings

Failure to follow these instructions may result in personal injury or damage to the VertiMetric device.

- Never open or tamper with the device or battery charger.
- Do not expose the device to excess heat. Doing so can result in fire due to the internal Li-ion batteries.
- Do not expose the device to moisture. This includes placing the device in water or exposing it to an excessively humid environment.
- Do not handle the device with wet hands. This is especially important while charging the device. Doing so may result in electric shock or damage to the internal circuitry.
- Only authorized LIC personnel should handle service of the device. Faulty maintenance/repairs may result in accidents and will void the product warranty.
- Do not drop, strike, or shake the device excessively. Doing so may result in damage to the internal circuitry.
- Lafayette Instrument Company Inc. is not responsible for personal injuries sustained while performing a vertical jump test. Please use caution when jumping and consult a physician if the ability to perform a vertical jump is in question.
- When jumping, always warm up by stretching the upper and lower extremities and performing a variety of cardiovascular exercises. Failure to do so can result in personal injury.
- Always ensure that the sensor strap is secure around the ankle of the test subject. Failure to do so can cause inaccuracy of data reading as well as the potential for an accident while jumping.
- Always jump in an open area, free of any physical obstacles.

Select Device Type
Select Device Type from the Drop Down Menu
Open the navigation menu by tapping the Action Bar Drop Down Menu in the upper right corner of the screen. Select ***Select Device Type*** from the menu.
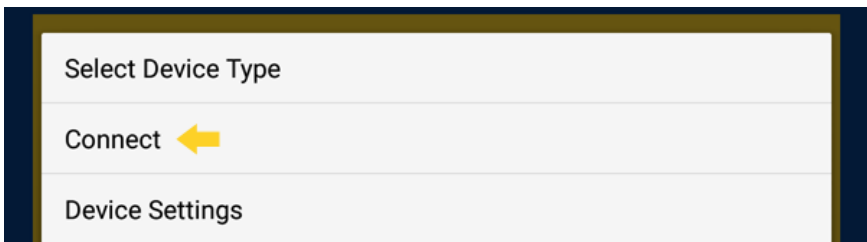

Select a Device Type
After selecting ***Select Device Type***, a selection box will open allowing you to choose between available device types. Use the drop down to select which device you wish to connect. VertiMetric was chosen for this example.

After selecting a device type, the selected device will be loaded at the top of the screen.

Connecting to a Device
Select Connect from the Drop Down Menu
Open the drop down menu by tapping the Action Bar Drop Down Menu in the upper right corner of the screen. Select ***Connect*** from the menu.

Select a Device to Connect

After selecting **Connect**, a new page will open allowing you to scan for available devices. All paired devices will automatically be displayed in the list. If the device you are looking for is not available in the list, tap the **Scan** button at the bottom of the dialog (see *Scan for a Device* for more information). Selecting a device that is not paired will cause a dialog box to appear asking you to pair with the device. Tapping PAIR will pair the device; upon pairing, the device will automatically connect.

Select a device to connect or press scan.
Paired Devices

Vert 12345XXX

LI Jackson

VertiMetric D

VertiMetric B

Scan for a Device

Scanning for a device will return a dialog box with two sets of devices: "Paired Devices" and "Other Available Devices" (other Bluetooth devices). Previously paired devices will be listed in the top section.

Selecting a device that is not paired will begin steps to pair the device (see *Select a Device to Connect* for more information).

Connection Successful

After selecting a device and pairing the device (if necessary), the application will attempt to connect to the device. Once the device has successfully connected, the Connection Bar (located below the Action Bar) will turn from red to blue, and the name of the connected device will appear. The device's current battery level is also noted by the battery icon in the Connection Bar.

connected to Vert 12345XXX

Device Settings

Open the drop down menu by tapping the Action Bar Drop Down Menu in the upper right corner of the screen. Select **Device Settings** from the menu. All Device Settings are available on a single page. Once all the settings are correct, tap the **Accept Changes** button. The following explains the meaning of each setting.

Jump Height Unit
Inches

Subject Weight Unit
Pounds

Number of Jumps: 5

Jump Timeout (seconds): 3

Jump Height Unit

From the Settings page, see *Jump Height Unit*. This setting governs the displayed unit of jump height for the app. The unit may be set for inches or centimeters.

Subject Weight Unit

From the Settings page, see *Test Duration*. This setting governs the displayed unit of subject weight for the app. The unit may be set for pounds or kilograms.

Number of Jumps

From the Settings page, see *Number of Jumps*. A slider controls the number of jumps that make up a single Jump Sequence. The Jump Sequence can have between 1-5 jumps. The chosen number of jumps will be stored together with the same timestamp.

Jump Timeout

From the Settings page, see *Jump Timeout*. A slider controls how long an incomplete Jump Sequence is open for data/jumping. A user may select any number between 1-10 seconds.

Test Settings
Subject Weight

In order to accurately calculate the power required during a Jump Sequence, it is necessary to have the weight of the subject. Tap the **Subject Weight** icon from the Test Action Bar at the bottom of the application. Another page will appear with a text area to type the subject's weight. The unit of measure can be modified in the Device Settings. After entering a weight, the weight will be displayed below the connection bar.

Subject Weight: 160 lbs

Performing a Jump Sequence

A Jump Sequence may be ran immediately following successful connection to a VertiMetric device. The app will use defaults for unit of measurement and test timeout, but a subject weight must be entered in order to receive power readings.

To start each jump phase of a Jump Sequence, tap the play button from the Test Action Bar at the bottom of the application.

If the subject fails to make a jump or the VertiMetric does not detect a valid jump before the Test Timeout is reached, the app will play a tone and display an error message. The user must tap the play button again to restart that jump phase.

Power Calculation

All resultants from the power calculations are in Watts. The calculations for power are completed by using the Sayers Formula. This formula is an estimation of the peak anaerobic power (PAP) of a completed jump.

PAP(Watts) = 60.7 x Jump Height(cm) + 45.3 x Body Mass(Kg) - 2055

Reference: Sayers, S., et al. (1999) Cross-validation of three jump power equations. *Med Sci Sports Exerc*. 31: 572.

Saving a Jump Sequence

After running a jump sequence, the results may be saved. To save a test tap the **Save** icon from the Test Action Bar at the bottom of the application. A Save Test Results dialog box will appear requesting you to select the Organization and Subject where you would like to save the results. Selecting an Organization filters the available subjects.

To filter the Subject list by Organzation, tap the drop down. Subject is a required field, and it can be populated by typing a name or beginning to type a name and selecting it from the populated list.

Note: The Save Jump Sequence form will not accept Subject names that are not already saved as subjects. The name listing that appears in blue to the right of the Subject field will scroll vertically if the name list is too long for the available space.

Once the desired Subject and Organization are selected, tap on the *Save Results* button.

Note: If a subject's weight was not entered prior to testing, it can still be entered before saving.

Tapping the *Save Results* button will close the dialog box and a toast message will appear stating "Test Results Saved". All force values visible on the main screen will be cleared, and the unit will be ready for additional testing.

Clear Test Results

After running a Jump Sequence, the results can be cleared by tapping the *Clear Results* icon in the Test Action Bar at the bottom of the application.

Note: It is not necessary to clear the results before running another sequence.
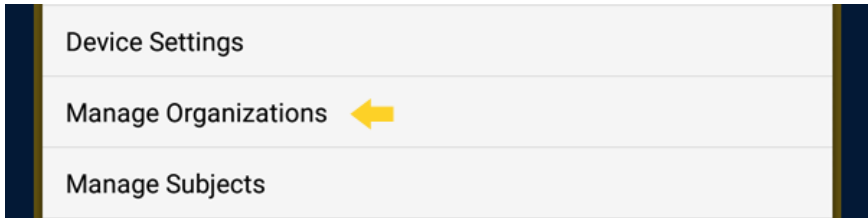
Battery Status

After connecting to a device, the device's battery status will be displayed in the Connection Bar. The app will update the status of the battery every 60 seconds.

connected to Vert 12345XXX

Manage Organizations

Manage Organizations Dialog Box

Open the navigation menu by tapping the Action Bar Drop Down Menu in the upper right corner of the screen. Select **Manage Organizations** from the menu.

Add Organizations

After selecting **Manage Organizations** from the menu, a new page will appear with all organizations listed. Tap the **Add** icon to add a new Organization.
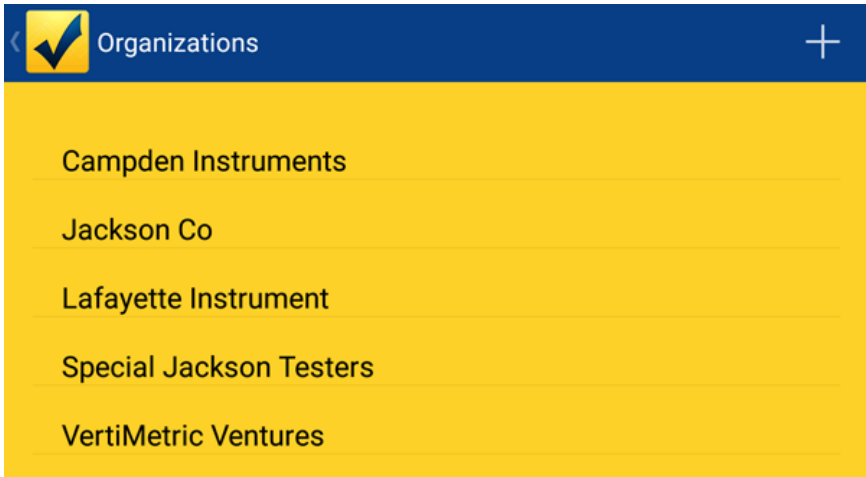

A new page will appear with a text area entitled "Organization Name". Type in the Organization Name then tap the **Save** icon.

Once the Organization is saved, a toast message will appear stating "Saved Organization", and the Organization list will be re-populated to include the new Organization.

Edit Organizations

After selecting ***Manage Organizations*** from the menu, a new page will appear with all organizations listed.

Tap the desired Organization and another page will appear. Type in the new or modified name and click the ***Save*** icon.

Once the Organization is saved, a toast message will appear stating "Saved Organization", and the Organization list will be re-populated to include the new Organization.
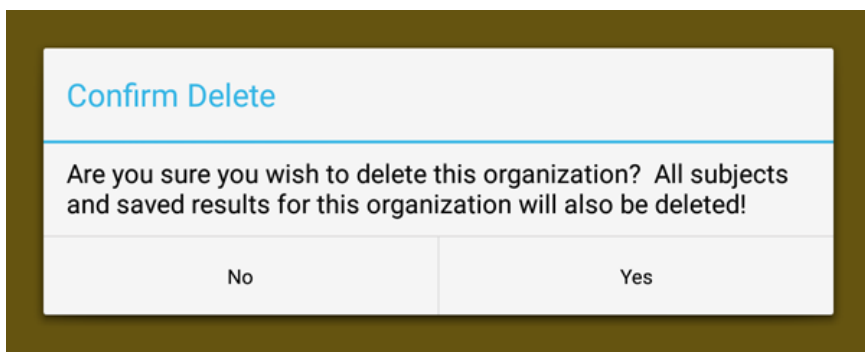
Delete Organizations

After selecting **_Manage Organizations_** from the menu, a new page will appear with all organizations listed. Tap the desired Organization and another dialog box will appear. Tap the **_Delete_** icon on the dialog box menu bar.

A dialog box will open asking you to confirm the deletion.
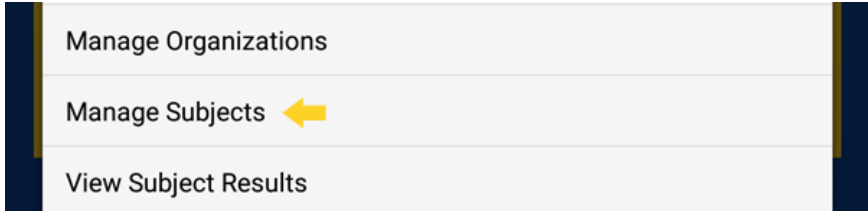

Once the deletion is confirmed, a toast message will appear stating "Organization Deleted", and the Organization list will be re-populated without the deleted Organization.

Manage Subjects
Manage Subjects Dialog Box

Open the navigation menu by tapping the Action Bar Drop Down Menu in the upper right corner of the screen. Select **Manage Subjects** from the menu. A new page will appear with all Subjects listed. Subjects may be filtered by using Organization drop down.

Manage Organizations

Manage Subjects ←

View Subject Results

Add Subjects

After selecting **Manage Subjects** from the menu, a new page will appear with all the Subjects listed. Tap the **Add** icon to add a new Subject.

Subjects

A dialog box will appear with a textareas entitled "First Name", "Last Name", "More Info", and "Organization". Selecting "New Organization" from the Organization spinner will bring up the New Organization dialog box. Type in the Subject Name then tap the **Save** icon.

Subject

Once the subject is saved, a toast message will appear stating "Saved Subject", and the Subject list will be re-populated with the new Subject.

Edit Subject

After selecting **Manage Subjects** from the menu, a new page will appear with all the Subjects listed. A new page will appear with all Subjects listed. Tap the Subject and another page will appear.
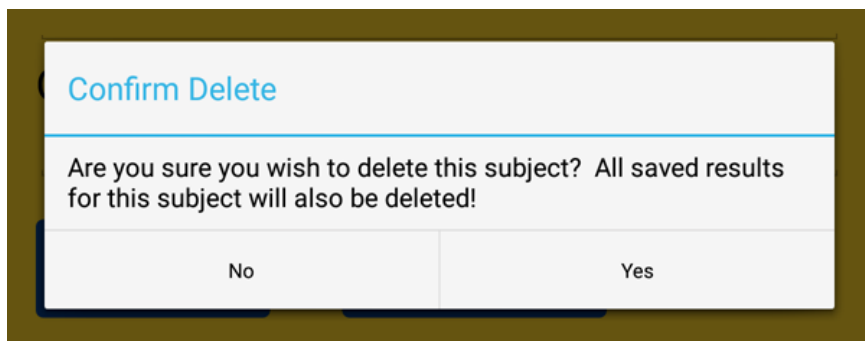

Tap the **Save** icon to complete the edit.

Once the subject is saved, a toast message will appear stating "Subject Saved", and the Subject list will be re-populated with the edited Subject.
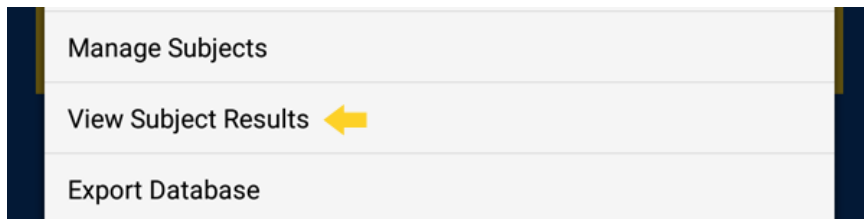
Delete Subject

After selecting *Manage Subjects* from the menu, a new page will appear with all the Subjects listed. Tap the Subject and another dialog box will appear. Tap the *Delete* icon on the dialog box menu bar. A dialog will open asking you to confirm the deletion.

Once the deletion is confirmed, a toast message will appear stating "Subject Deleted", and the Subjects list will be re-populated without the deleted Subject.
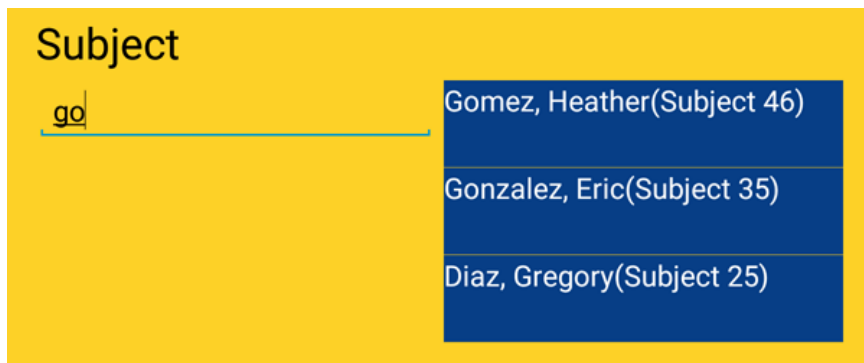
View Subject Results

Open the navigation menu by tapping the Action Bar Drop Down Menu in the upper right corner of the screen. Select **View Subject Results** from the menu.

A new page will appear with search criteria required for the Subject Results. Submitting the form without filtering by Organization will return all results that fit between the chosen Start and End Dates.

Use the "Organization" drop down to filter the Subjects by Organization; typing in the "Subject" field populates a selection list of relevant Subject Names (filtered by the current organization).

Note: The name listing that appears in blue to the right of the Subject field will scroll vertically if the name list is too long for the available space.

Test type will be shown in the drop down. Select a date range, and tap the **Filter Results** button.

A list displaying all results within the selected filter criteria will appear. To view details for specific results, tap the desired record in the list. Once selected, a new page will appear with additional details.

From the Specific Subject Results dialog box, it is also possible to navigate back to the filtered results (tap the **Back** icon) or Delete the Result (tap the **Delete** icon). Selecting to delete the result will require a confirmation. Once deleted, the filtered results will be refreshed.
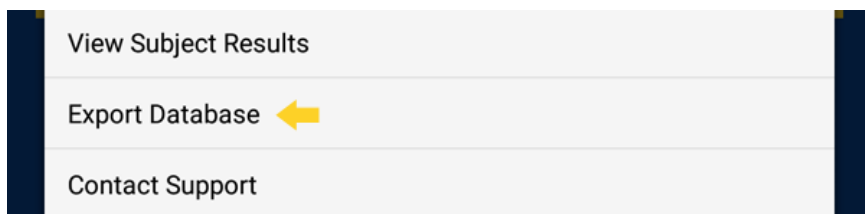

A print icon is available at the top of the result.

Note: See the *Print Options* section for more details about how to setup your device to print.
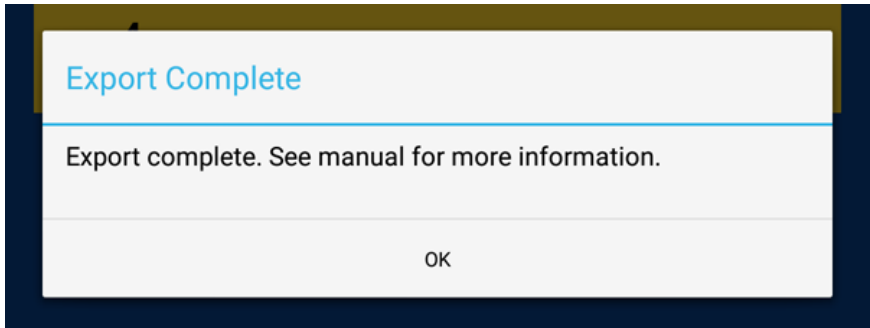
Export Database

Open the drop down menu by tapping the Action Bar Drop Down Menu in the upper right corner of the screen. Select **Export Database** from the menu.

A toast will notify the user that export has started, and the screen will turn white temporarily.

A dialog box will appear confirming the database (.CSV format) has been exported.

The database can be found in the **External Storage** area where application data is stored. For this example (Google Nexus 7 Tablet), the path "`Storage > sdcard0 > Android > LEval`" was used. The exported file can be accessed via PC connection (or alternatively through the use of a 3rd party file manager) by navigating to "`[computer-name]\[tablet-name]\Internal storage\Android\LEval`".

Note: There are many popular file managers available in the Google Play store; Lafayette Instrument recommends that users research which one would work best for his/her organizational needs.

Print Options

The Android platform allows printing through several functions. The print dialog allows connections for Network Printers, Cloud Printers, Printing to Google Drive, and also printing to .PDF files. For more information regarding printing to your network printer, read the printer's documentation.
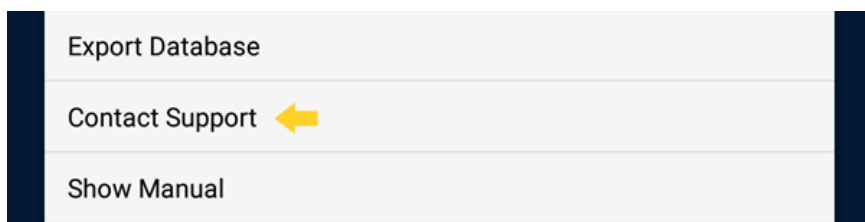
Printing to Google Cloud Print registered printers:
https://support.google.com/cloudprint/answer/1686197?rd=1

Printing to Google Cloud Print Ready Printers:
http://www.google.com/intl/en/cloudprint/learn/printers.html

To print to a .PDF file, select "Save as PDF" from the print dialog box, and tap Print button. The print dialog will direct you to name the pdf and then save it in the Downloads area.

Contact Support

In the event of an unexpected error or by choosing *Contact Support* from the Action Bar drop down, the user will be prompted to submit a report to Lafayette Instrument Company.

A short form will appear asking the user to include contact information and any comments regarding the issue. The form can be filled out by tapping in each field and entering the applicable information individually. When completed, the form may be sent to our team of software engineers by tapping the *Submit* button.

Icon Glossary

The following icons can be found in the VertiMetric interface of the LEval app. See the section corresponding to the icon for more information.

Action Bar Dropdown: Tapping this icon brings up the main dropdown navigation for the app.

Device Battery Indicator: Non-tappable icon that shows the current status of the connected device's battery.

Set Subject Weight: Tapping this icon brings up a form to enter Subject Weight. Required for power calculation.

Run Test: Tapping this icon begins the selected test type with the chosen parameters.

Save Test Results: Tapping this icon brings up a form to select a subject and save the previous test results.

Clear Test Results: Tapping this icon clears previous test's results without saving.

Add: Tapping this icon brings up a form to add a new item.

Save: Tapping this icon saves the current item.

Delete: Tapping this icon deletes the current item. Deleting a subject removes all test results for that subject. Deleting an organization removes all subjects and test results for that organization.

Print: Tapping this icon brings up a print dialog box.

End-User License Agreement

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