wavelet

Wearables Platform for Research

Wavelet Onsite App

PRODUCT MANUAL

VERSION 1.0

Table of Contents

Introduction

Thank you for using the Wavelet Wristband!
This user manual will help you get started using your new Wristband and iOS app.

Overview

The Wavelet Wristband is designed for tracking your daily activity and physical movement associated with applications in physiological monitoring. The Wavelet Wristband provides non-invasive measurement of pulse waveform and heart rate by photoelectric plethysmography (PPG).

As a clinical operator of this device, you can collect and organize data from patients and subjects through Wavelet's iOS tablet app. This data will then be processed and stored on our secure servers and available for viewing and analysis on Wavelet's web portal.

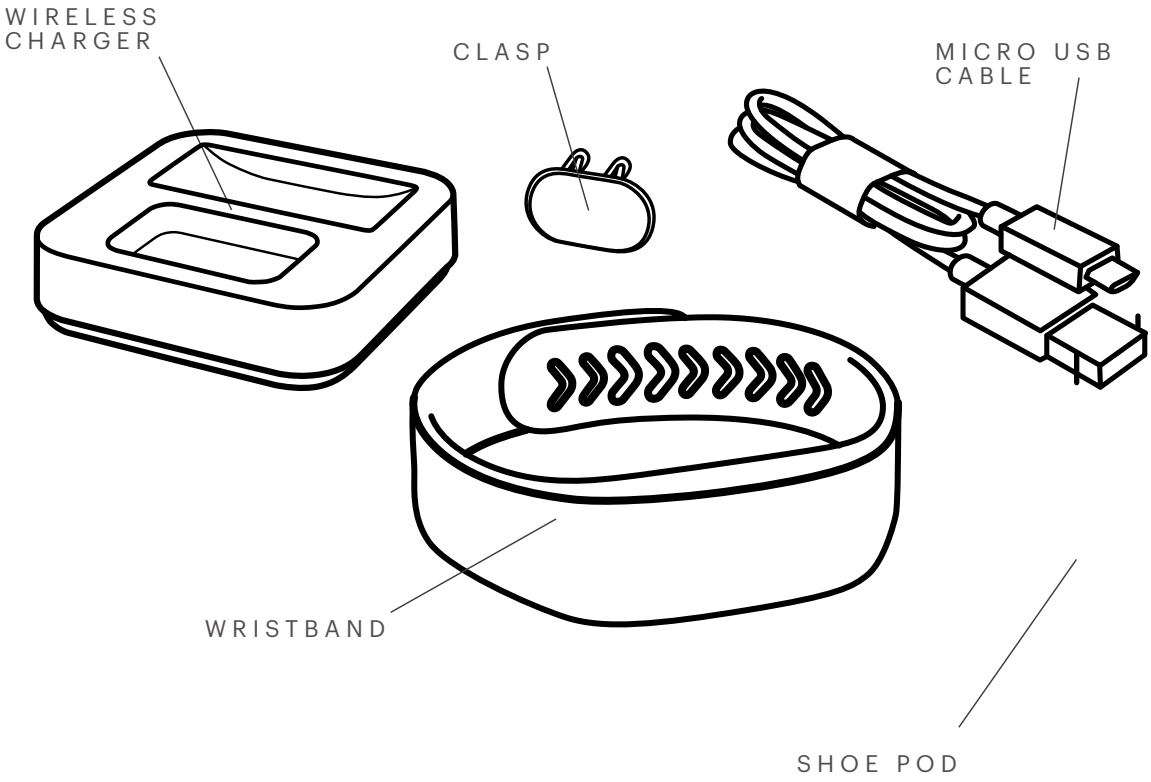
This guide will walk you through how to get started using the Wavelet device and companion app.

Getting Started

This section will guide you through all of the steps necessary to start using your Wavelet Wristband and Pod.

What's in the box

Your package should include the following items. You will need all of these items to set up and use your Wristband.



Charging the Wristband and Pod

Before using your devices you will need to fully charge them and update their firmware.

Plug in your charger to a powered USB port. The LEDs should light up white. Place the Wristband in the slot towards the back of the charger as shown in the illustration below. The white lights on the charger will turn orange next to each device when charging properly. Each LED will blink or remain white if not charging properly or if the device is not placed properly. Note: The Pod activity sensor shown in the picture may not be provided for your study. Please contact with your Wavelet Health representative for more information.

Your devices requires about 90 minutes to fully charge their lithium-polymer batteries. Once fully charged, the LEDs on the charger will change back to white. It is recommended to fully charge your device as you finish the rest of the setup process. With normal use, your Wristband should last about four days on a single charge, while your Pod should last about 5 days, both depending on use.

Wavelet Onsite App Overview

The Wavelet Onsite app is your link to the Wavelet Wristband. Use it to interact with your Wristband and collect data.

You will need a compatible iPad and to download the free Wavelet Onsite app. Please email support@wavelethealth.com if you need support getting set up.

To connect with you Wristband, you must turn on Bluetooth on your iPad. This setting can be found in your iPad's settings.

Internet

The Wavelet Onsite app requires an internet connetion to transfer recorded data to Wavelet's servers. Please connect your iPad to Wi-Fi or a cellular data service during use.

Wavelet Onsite App Compatibility

The Wavelet device is compatible with select iOS devices including:

iPad 3 & 4, iPad mini & mini 2, iPad Air, Air 2, & Air 3, all versions of iPad Pro

Download on the App Store

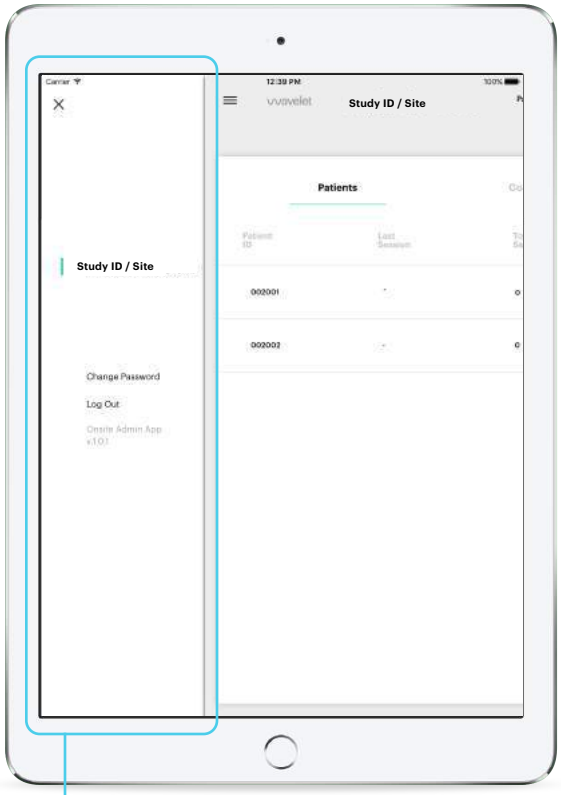
Log In with Admin Profile

You will need to login to the app with the credentials shipped or emailed to you. If you have not received this email, please contact your supervisor or email us at support@wavelethealth.com. Upon your first time logging in, please change your password. See page 5 for details.

Using The Wavelet Onsite App

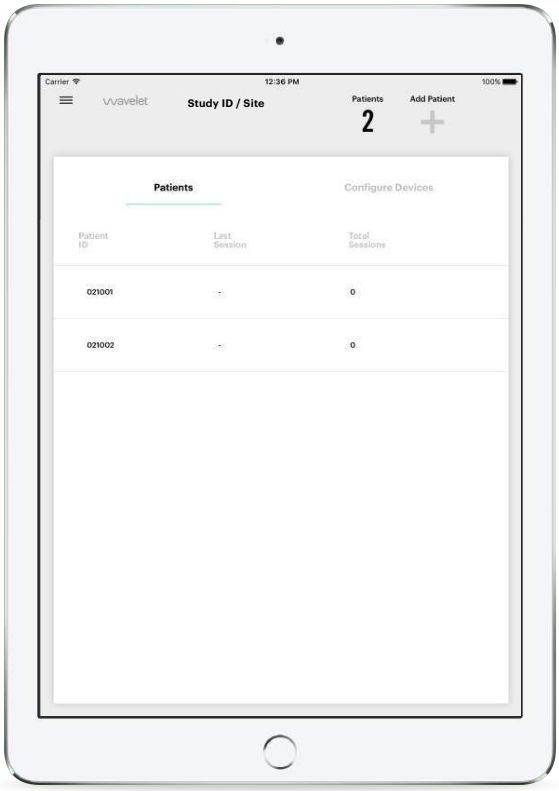
Data Recording Workflow

This section will walk you through setting up and using your Wavelet Wristband for the first time. The Wavelet Onsite app is the link to your Wristband. Use it to manage Wavelet devices and collect data. The app will welcome you with the Main Menu where you can see your affiliated sites and the Patients Page. Tap on the Patients Page to begin collecting data.



Main Menu

The Main Menu displays the affiliated site information. Admin can change their password and log out of the app here.



Patients Page

The Patients page is used to manage all subjects and their collected data. Each patient's unique User ID should be added as shown on page 7. Tapping on an individual's user ID allows you to record data for that subject.

Manage Patients

To begin recording data, tap on the “Patients” tab. Tap “Add Patient” to set up a new patient. You must enter the patient’s ID and demographics. Once the patient(s) is set up, select the desired patient ID to record their data.

Patients

Recording Data

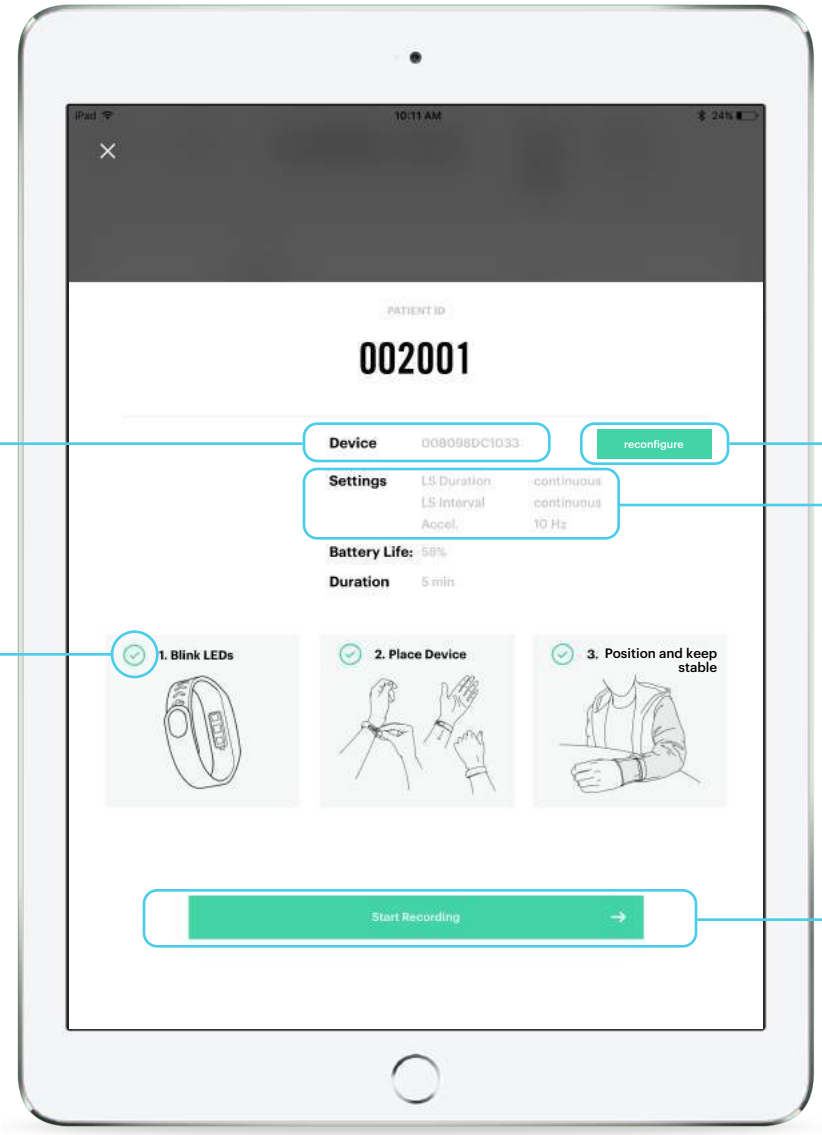
Tapping a patient ID leads to the recording page shown below. Before recording, confirm that the device's MAC ID is displayed. If not, please see page 10 for instructions on pairing a device. Follow the illustrated checklist to begin recording:

1. Blink LEDs to locate device.
2. Ensure the wristband is placed / secured correctly – see page 8.
3. Instruct the patient to rest their arm on a flat surface and keep it stable. For best results, cover the wristband with a light-blocking fabric.

Tap "Start Recording" to begin the recording process.

Paired device's MAC ID. See page 10 if no device is paired

Tap each of these steps before recording



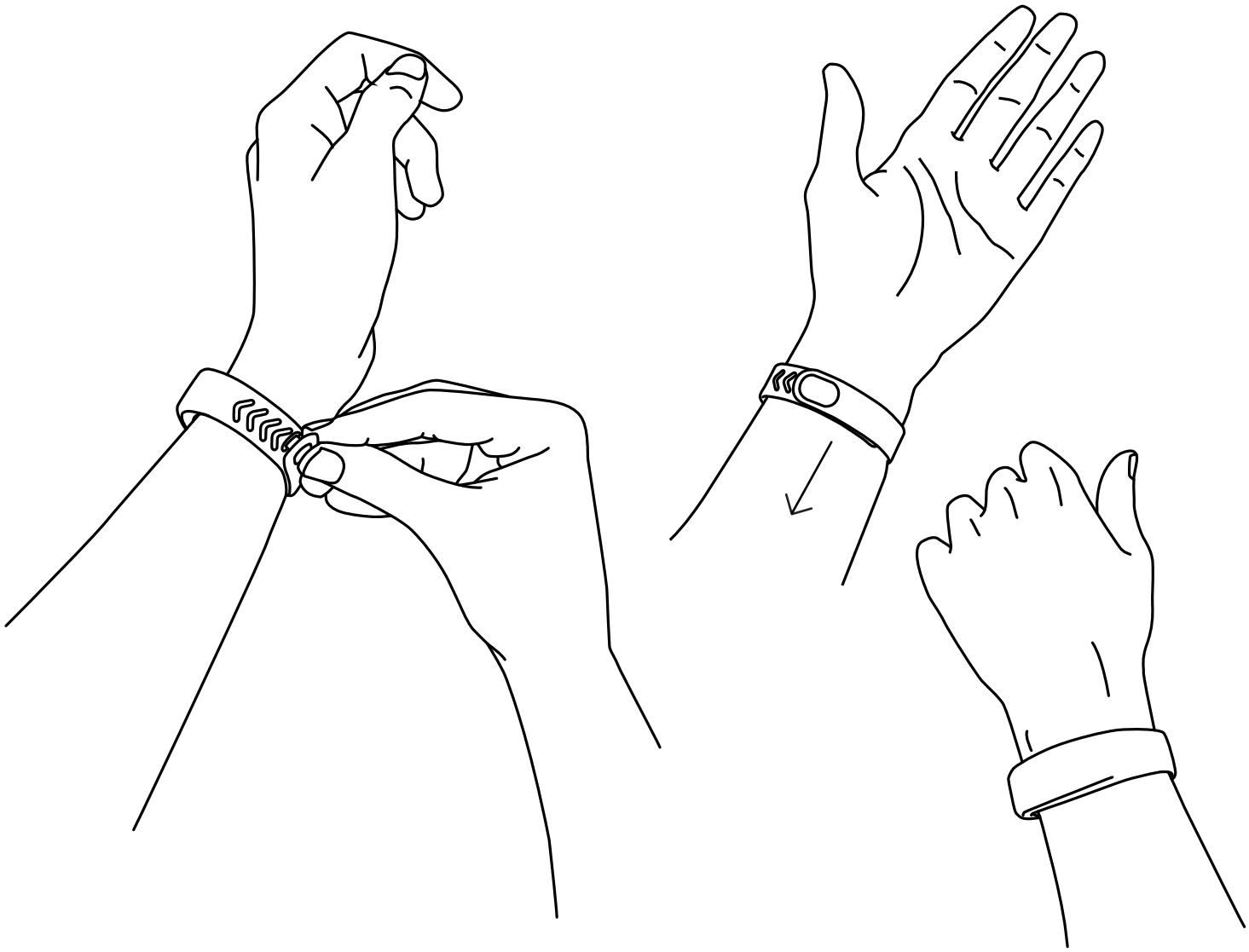
Reconfigure device settings and recording duration

"Start Recording" button is activated once all steps are checked

Recording

Placing the Wristband On Patient

Wearing the device properly is critical to getting reliable data. It can be worn on either wrist. When worn properly, both of the teeth on the clasp should engage with the Wristband fully. The device should sit above the wrist bone as illustrated below. The sensor unit inside the wristband should sit snug against the skin so the sensors can collect a high-quality signal. The most comfortable fit is often achieved by securing the device with some slack and then sliding it up (towards the elbow) until it is snug.



Recording Countdown and Confirmation

Once recording begins, a countdown timer will be displayed. Please keep Wavelet Onsite app active, with the iPad on and unlocked during the recording. Once the data has finished syncing, tap “Done” to finish the recording session. Data is now recorded and transmitted to our server. If you wish to record another session, begin the process again starting at page 6.

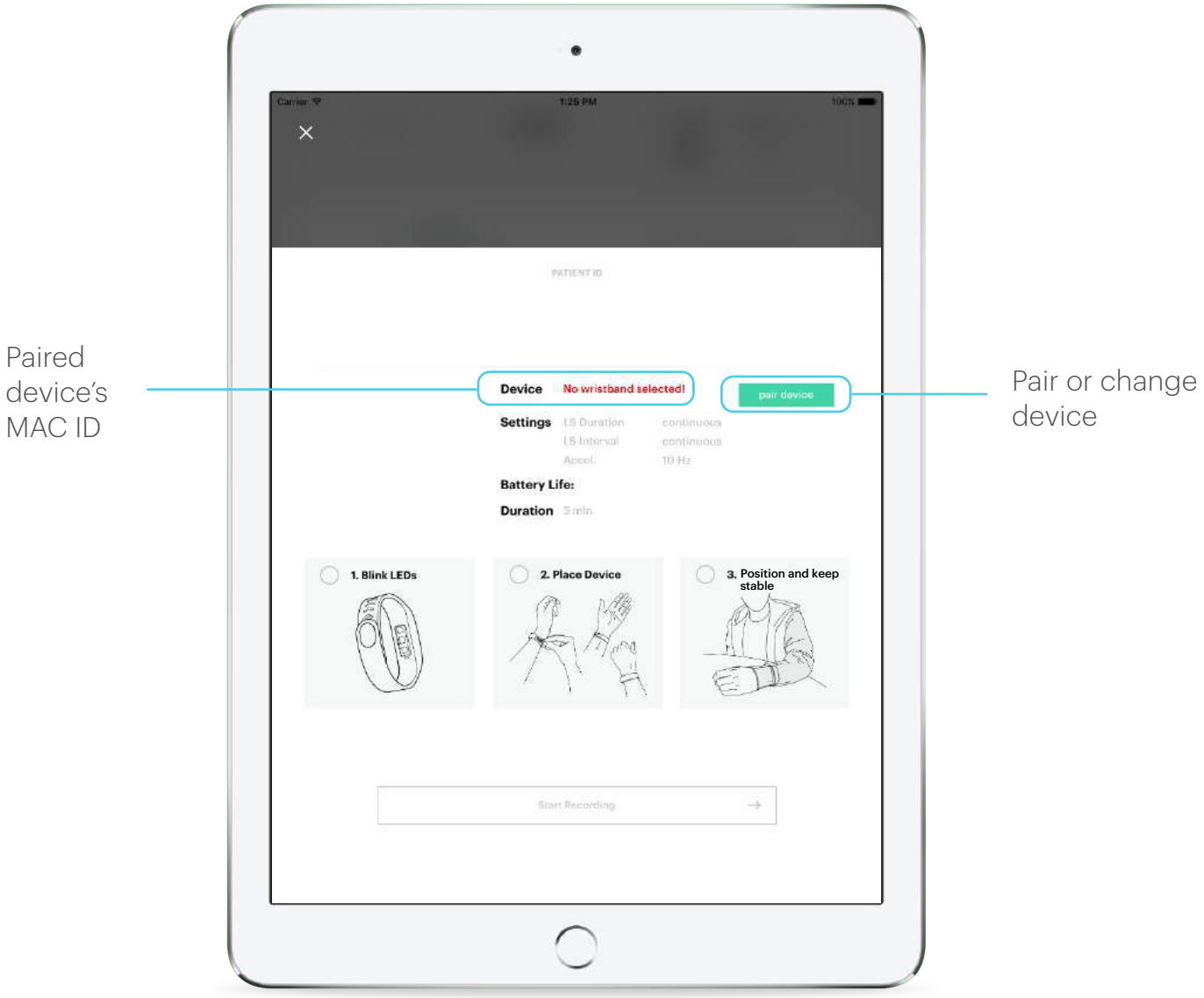
Recording Countdown

Data Transfer Confirmation

Device Management

No Wristband Selected

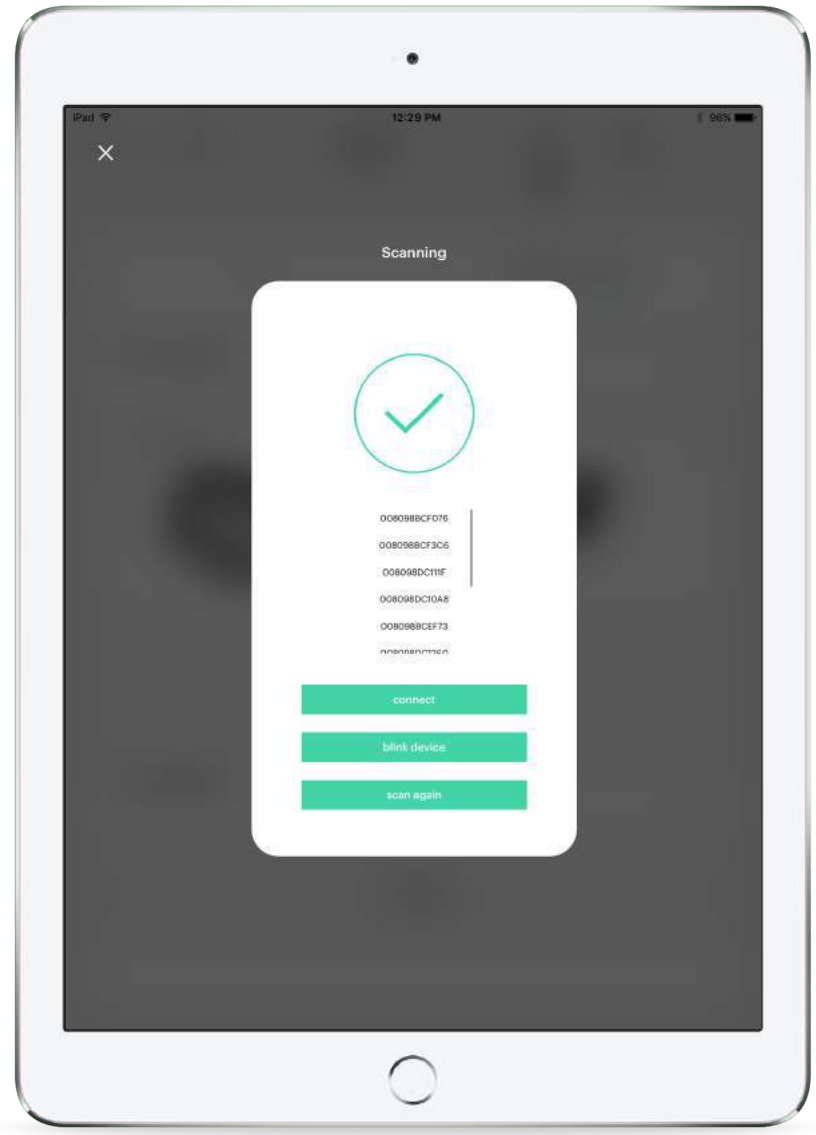
If no devices are currently paired, the Device section will display “No wristband selected”. The “pair device” button will turn green. Press this button to scan for nearby devices. Once a device is paired, the “reconfigure” button will appear. You can customize the device configuration and / or continue with the recording process.



Recording

Choose Device

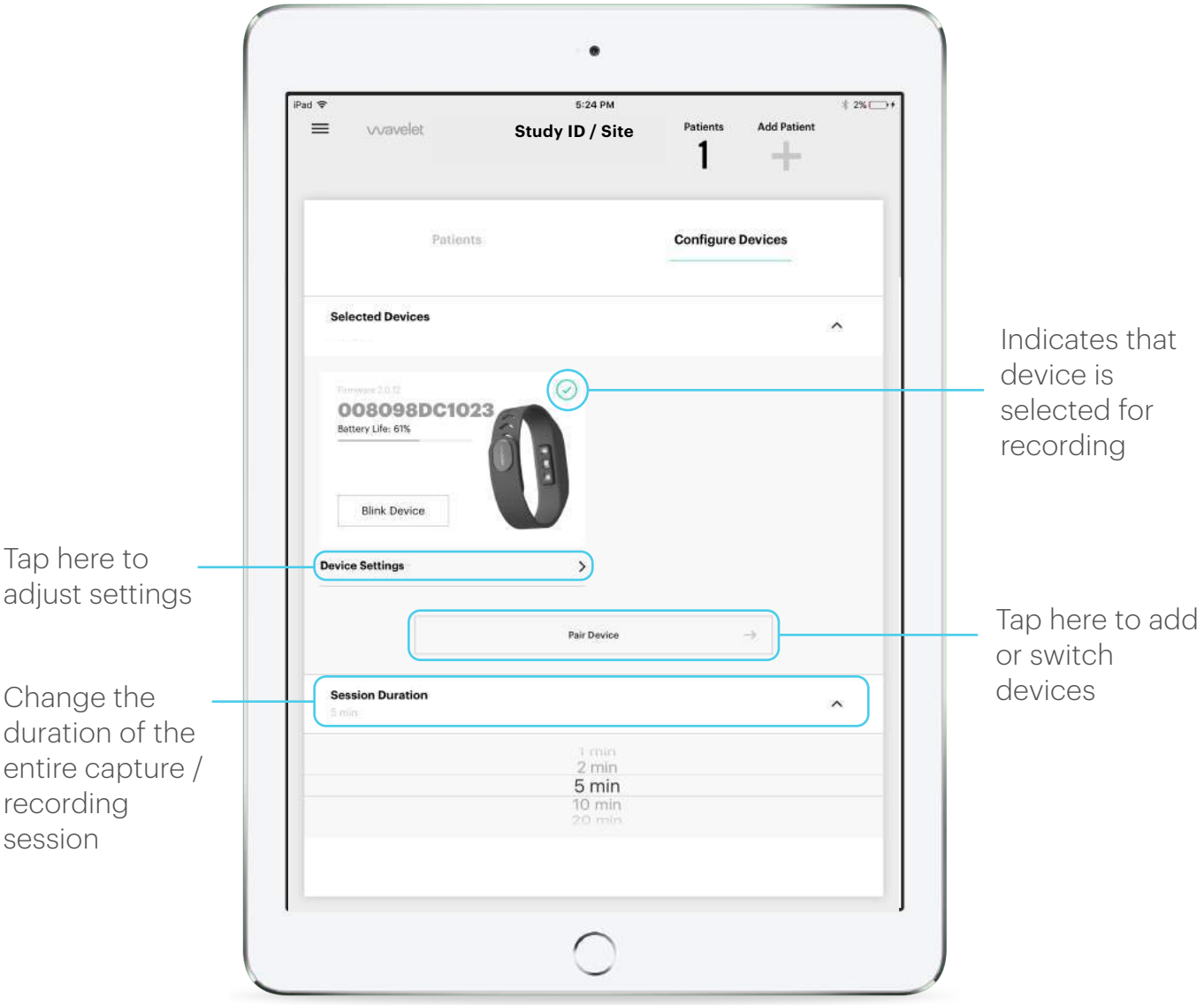
When attempting to connect to a device, all nearby devices will show up on this list. Select a device by tapping it's Mac ID number. To locate the selected device, tap "blink device", which will flash the red LEDs on the bottom of the device for several seconds. Once the desired device is selected and identified, tap "connect" to pair with it.



Connect

Configure Devices

This page allows you to manage devices and customize device settings, including light and motion sensor sampling rates and light sensor capture intervals. Connected devices will be displayed along with their current battery life and firmware version. The Wavelet Onsite app can be paired with one Wristband at a time. To switch to another Wristband tap “Add new”, which will open the scanning page as shown on page 11. The recording Session Duration can be adjusted from “30 seconds” to “unlimited” using the roller at the bottom of the screen. Tap “Device Settings” to adjust the device’s recording settings as described on page 13 and 14.

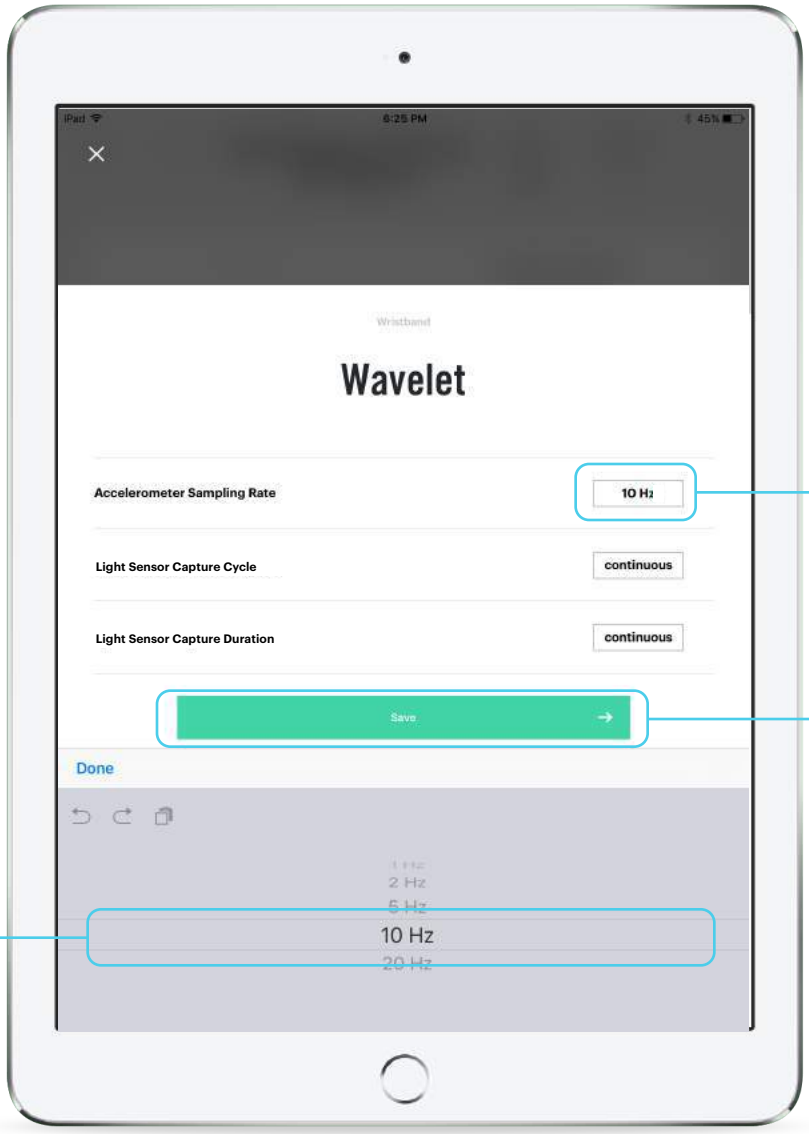


Configure Devices

Customize Device Settings: Motion Sensors

Device sensor settings are customizable for various applications to help investigators meet their research goals. Administrators can adjust motion and light sensor settings by tapping on the desired sensor's current setting and using the roller menu that appears at the bottom of the page.

Motion sensors, i.e., accelerometers and gyros on Wavelet devices collect data continuously once a recording session is started as described on Page 7. For applications that involve fast cyclic motions (e.g. hand gestures during sleep) or require higher sampling frequency for accurate assessment of physical activity (e.g. frequency domain analysis of tremor). Accelerometer and gyro sampling rates can be adjusted between 1 and 30 Hz.



Tap here to adjust settings

Tap here to save settings

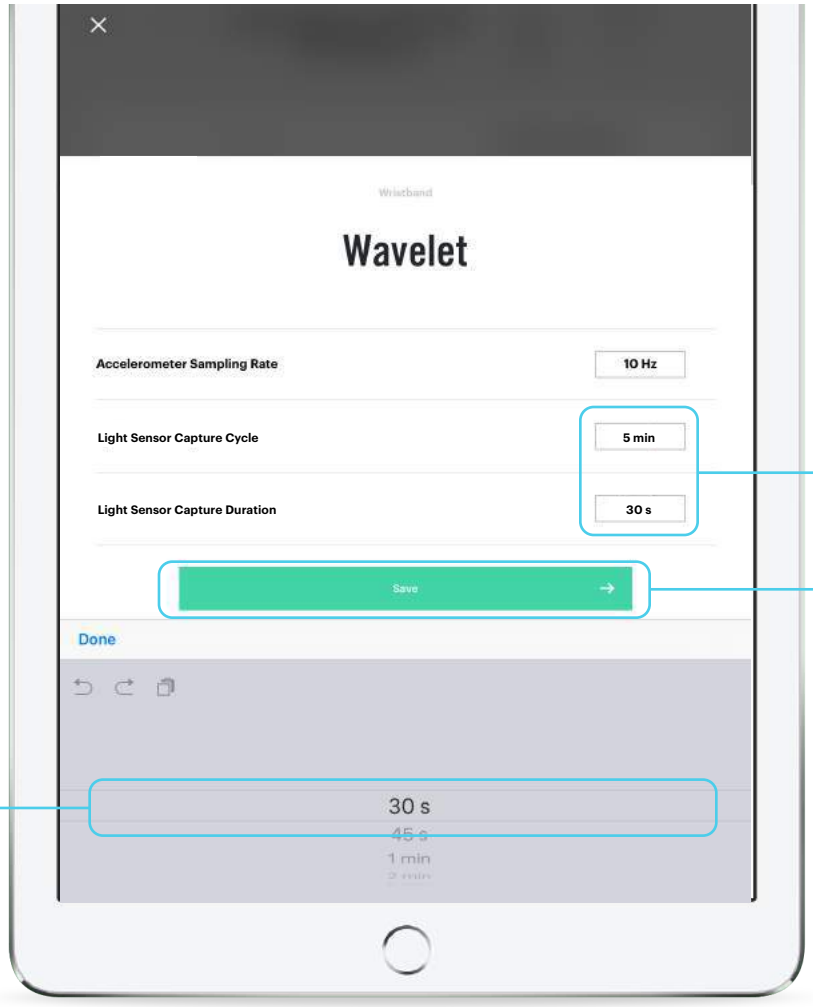
Scroll through device setting options once selected above

Customize Device Settings: Light Sensors

While motion sensors always collect data continuously, light sensors can be adjusted to collect data either continuously or intermittently during the Session Duration. To collect data continuously, tap on “Light Sensor Capture Interval” and select “continuous” using the roller.

For long-term monitoring applications where battery life needs to be extended or when continuous data recording is not required, light sensor captures can be collected in cycles called “Capture Cycles”, which dictate how often data captures take place during a recording session.

To capture intermittently, adjust the “Capture Cycle” and then adjust the “Capture Duration”, i.e., how long the LEDs blink and data is captured. For example, to collect data every 5 minutes for 30 seconds at a time, set “Capture Cycle” to 5 minutes and “Capture Interval” to 30 seconds.



Caring For The Wristband

The lenses of the Wristband should be cleaned periodically, and ideally before each data capture; a simple wipe with a damp cloth is sufficient. Never let harsh chemicals or solvents come in contact with the device.

The Wristband is designed to be worn 24/7 if needed. It is fully waterproof and can be left on while bathing or showering. It is, however, recommended to remove the wristband periodically so your skin can have a break.

Storing the Wristband

Although it is waterproof, the device should be stored in a dry place at room temperature. Never overheat, puncture, or dispose of the device. It contains a Lithium-polymer battery that can be hazardous if not cared for properly.

Checking the Current Battery Level

The current battery status can be see on the “Recording” page (page 7) or “Configure Devices” page (Page 12).

Returning the Wristband

Once the rental contract is expired, please repackage and return devices to the following address:

Wavelet Health
465 Fairchild Drive, Suite 228
Mountain View, CA 94043

For details, please email us at support@wavelethealth.com or call 650-422-0339.

Troubleshooting

Use this section to diagnose issues that you may face during setup and use of this product. If these methods prove unsuccessful, please contact support at support@wavelethealth.com. For fastest support, please include photos or screen shots illustrating your problem.

Charging Wristband

Wristband is not charging, or the charger LED won't change color

• Ensure that the charger is plugged in properly and that the cable is properly inserted into a computer or supported base and the charging pad.

• Ensure that the charging pad is not upside down; the top has a rubber ring on the outermost edge, as seen in the image on page 3.

• The LED is green when NOT charging; it will turn BLUE when it is engaged. If it is flashing green then it is not properly placed.

• The app shows the approximate battery level once you are connected to the device. The battery should last up to 6 days.

Connecting Wristband

Wristband is not discoverable by the app

• Ensure that your iPad is supported by the app.

• Ensure that the battery is not dead or nearly depleted.

• Restart your iPad and try connecting again.

• If the device is not showing up after restarting your iPad and charging the Wristband, email support@wavelethealth.com for additional support.

FAQs

Is my iPad compatible?

The Wavelet device is compatible with select iOS devices including:

iPad 3 & 4, iPad mini & mini 2, iPad Air, Air 2, & Air 3, all versions of iPad Pro

Is the Wavelet Wristband waterproof?

The Wavelet Wristband is waterproof up to 3 meters and can be worn swimming. It is recommended to remove the device periodically as anything contacting your skin for prolonged periods can cause irritation. Discontinue use and contact support at support@wavelethealth.com if irritation persists.

Do patients need to shave the hair on their wrist?

Although hair may attenuate the signal quality, thanks to Wavelet's sensor technology, use of Wavelet wearables do not require shaving any body hair.

Is it important to wear the Wristband so that the holes on the wrist band stays outside or inside the wrist?

For pulse wave analysis the Wavelet Wristband can be worn bidirectionally and on either wrist thanks to the symmetrical design of the Wristband's optical sensor. However, if physical activity tracking and motion analysis is of interest, please follow the Wristband orientation shown in the illustrations on page 8.

Wristband Specifications

Manufacturer	Wavelet
Head Office	Mountain View, CA
Origin	USA
Sensor Size	2mm x 2mm
LEDs	2 red LEDs, 2 IR LEDs
Wristband Weight	23 grams
Shipping Weight	150 grams
Shipping Dimensions	70 x 70 x 95 mm
Communication Interface	Bluetooth LE
Display	Mobile device display / app
Heart Rate Accuracy	+/- 3 BPM
Battery	130 mAh Li-ion
Operating Time	Up to 5 days
Operating Temperature	-20 – 150 degrees F
Water Resistance	Fully submersible 5 ATM
Band	Silicone, fully replaceable
Other components	3-axis accelerometer, 3-axis gyroscope

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