Lifeleaf Smartwatch User Guide

A. User Requirements Specification

- The Lifeleaf is Lifeplus' smartwatch and is wearable device on the wrist.

Figure 1 Lifeleaf main watch face

- The band is magnetic and wore tight on the wrist.

Figure 1 Magnetic Band

- User to tighten the wrist band in order to make sure the sensor at the bottom of the watch does not move relative to the wrist. This assures that there is less to almost no motion between sensor relative to the skin at the wrist and also that there is less external ambient light affecting the signal quality.
- The watch communicates with an external received via a secured Bluetooth wireless connection
- The external receiver (smartphone) has the Lifeplus App
- User can send the following requests from the App to the smartwatch
    - Measure now: all physiological parameters are measured and sent to the to the App installed in an external receiver (smartphone)
    - Calibrate now: PPG signal is collected and sent to the App installed in an external receiver (smartphone)
- Watch collects the following user physiological parameters automatically at a predetermined frequency or just per user request:
    - Heart rate

    - Blood pressure
    - Respiration rate
    - Oxygen saturation
    - Blood glucose
- The watch also collects the source signal called PPG (photoplethysmography)
- The data collected is stored in an internal memory in the smartwatch
- The collected data is displayed at the watch screen
- The collected data is also wirelessly sent to the user external receiver via bluetooth.

B. User Manual or Instructions for Use

1. Power button is the smartwatch crown.
2. The smartwatch is switched on by pressing and holding the crown for 3 seconds. The Lifeplus logo appears on the watch screen upon the user pushing the crown
3. The smartwatch is switched off by pressing and holding the crown until the watch goes off
4. The charger is through a magnetic pogo pin that connects at the bottom of the watch. The charger connector is a USB connector that can be connected to a USB power adapter or to a laptop. For a faster charge, use the a power outlet and charging via a laptop can be very slow.
5. The watch has the battery indicator on the main watch face. A full battery can do continuous measurements of vital for 3 days.
6. It is recommended however not to let the watch's battery run empty. It is recommended to put the battery on the charger when not in use
7. The watch is connected to the App via BLE 4.0 using the QR-code that is one of the watch face. Scan the QR-code of the watch with Smartphone where there App is installed and the watch and the smartphone where the App is installed with be paired via the BLE stack.

C. Technical Watch Specification

LifePlus Smartwatch High Level Specification	
	Description
General	Lifestyle & Low power Smartwatch for continuous vital parameter tracking
Charger	Li-Polymer Charge Management Controler (wireless) Inductive charger (no connector)
	Battery Gauge
Battery	Rechargeable lithium Ion battery (up tp 500mAh) Up to 750 charges, 7 years lifetime Size: Size: 29mm x 36mm x 4.75mm (or less)
Bluetooth	BLE 4.0 IOs/Android compatible
CPU	MT2502C From Mediatek Long term: Custom processor (coming from a foundry)
	Accelerometer, gyroscope, magnetometer
Flash	256MB flash
Memory	256MB SRAM
Crystal oscillator	Crystal oscillator
LED Sensor	PPG sensor (will provide our sensor), SFH7072 from OSRAM
Motion Sensor	LSM6DS3H from ST Micro
AFE	Analog Front End for signal conditioning, AFE4405 from TI
	ADC
Case	Case (water resistant) / touch screen Circular shape Size: ~ 51 x 44 x 13.4mm Charge is inductive (no connector, since case water resistant) Stainless steel as material Color: black, silver
touch screen	1.22" IPS full view, 240*240 pixel 3D AMOLED Capacitive touch screen,16M colors 360 x 360 pixels (~278 ppi pixel density)
Band material	leather, magnetic stainless steel
Strip Length	19-26cm, adjustable
Pedometer	automatically running, including Step records, Calories calculation, Distance
Notification	clock, stop watch, calendar, push notification display

Other functions	clock/calendar display (goes to sleep after 60s, comes back with screen touch) Pedometer (step counts)
Tests	Functionality (pcb yield), heat, Emission (radiation), ESD, Dust, drop, water resistance, chemical reactions, Aging, battery & adoptor, Salt & fog corrupting, plug & pull USA FCC compliances & certifications (to be discussed)

FCC Statement

1. 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.

(2) This device must accept any interference received, including interference that may cause undesired operation.

2. 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.