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HealthRatePro

**User Manual**

First Year Hardware Project

School of ICT

Metropolia University of Applied Sciences

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**Version history**

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# Introduction

Welcome to the Heart Rate Pro! This device is designed to give accurate heart rate readings consistently. It's perfect for athletes, healthcare pros, and anyone focused on their heart health. With Heart Rate Pro, you can easily track your heart rate and understand heart rate variability (HRV). This guide is here to help you set up, use, and troubleshoot any issues you might have with Heart Rate Pro.

The content is organized into different sections for easy reference:

Introduction: A quick overview of Heart Rate Pro, including its uses and who it's designed for.

Getting Started: This section helps you set up Heart Rate Pro and get it running smoothly.

Using the Device: Learn how to measure your heart rate, analyze HRV, and view past data.

Troubleshooting: If you run into any problems, this section has solutions and info on contacting support.

Additional Information: Technical specs, warranty info, and more details about Heart Rate Pro.

Heart Rate Pro helps you monitor your heart rate and assess your heart health in real-time. By measuring your heart rate and analyzing HRV, you can get insights into your cardiovascular health and track changes over time.

* Heart Rate Pro uses advanced tech to give precise heart rate readings, so you can trust the accuracy of the data.
* It's compact and easy to use, wherever and whenever you need it making it the most convenient solution on the market.
* Beyond just measuring heart rate, Heart Rate Pro can do basic HRV analysis and even work with Kubios software for more advanced analysis.
* It is fully customizable; you can personalize your experience with Heart Rate Pro by adjusting settings to suit your needs.
* Heart Rate Pro keeps track of your past measurements.

Heart Rate Pro is great for athletes, healthcare pros, health-conscious individuals, and even research institutions looking into cardiovascular health and performance.

# Getting Started

# Using the Device

Now that you've successfully set up HeartRatePro, you can begin using it to monitor your heart rate and track your cardiovascular health. This section will guide you through the process of using the device, including how to start and stop heart rate measurements, navigate the menu options, and interpret the displayed information.

* 3.1. Starting a Heart Rate Measurement

To start measuring your heart rate, navigate to the main menu using the controls on the OLED screen.

Select the "Measure Heart Rate" option from the menu.

Once selected, the device will initiate the heart rate measurement process automatically.

Place your finger gently on the heart rate sensor and remain still while the device captures your heart rate data.

After a few seconds, the device will display your current heart rate (in beats per minute, BPM) on the OLED screen.

* 3.2. Stopping a Heart Rate Measurement

If you wish to stop the heart rate measurement process at any time, simply press the designated stop button on the device.

The device will halt the measurement process and display the last recorded heart rate value on the OLED screen.

* 3.3. Navigating the Menu Options

HeartRatePro features a user-friendly menu system displayed on the OLED screen.

Use the navigation controls to scroll through the menu options and select the desired function.

The menu options include:

* Measure Heart Rate: Initiates the heart rate measurement process.
* Basic HRV Analysis: Displays basic Heart Rate Variability analysis metrics.
* History: Shows a history of previous heart rate measurements with timestamps.
* Kubios: Collects data for advanced analysis using the Kubios software.
* 3.4. Interpreting Heart Rate Data

The device will display your heart rate in beats per minute (BPM) on the OLED screen.

Ensure that your heart rate falls within a normal range for your age and fitness level.

Consult with a healthcare professional if you have any concerns about your heart rate or cardiovascular health.

* 3.5. Advanced Analysis with Kubios

Select the "Kubios" option from the main menu to perform advanced analysis of heart rate data.

Follow the on-screen instructions to collect data for at least 30 seconds.

HeartRatePro will send the collected data to the Kubios software for analysis.

Once the analysis is complete, the results will be displayed on the OLED screen for interpretation.

* 3.6. Additional Features

HeartRatePro also offers additional features, including connectivity to a Wi-Fi network for data transmission to a client laptop over MQTT. These features enable remote monitoring and analysis of heart rate data by healthcare professionals.

Congratulations! You are now equipped with the knowledge to effectively use HeartRatePro to monitor your heart rate and track your cardiovascular health. If you encounter any difficulties while using the device, refer to the troubleshooting section of this user manual for assistance.

# Troubleshooting

Encountered an issue with your HeartRatePro device? Don't worry, most problems can be easily resolved with the help of the following troubleshooting guide. If you're unable to resolve the issue on your own, feel free to contact our technical support or customer service team for further assistance.

Problem: Device Not Powering On

Solution: Ensure that the device is charged properly by connecting it to a power source using the provided USB cable. Check if the power indicator LED lights up when the device is plugged in. If the device still does not power on, try resetting it by pressing and holding the power button for 10 seconds.

Problem: Inaccurate Heart Rate Readings

Solution: Make sure that the heart rate sensor is clean and free from any dirt or debris. Ensure that your finger is placed securely on the sensor during measurements and avoid moving it excessively. If the issue persists, recalibrate the device by restarting it and following the setup instructions again.

Problem: Connectivity Issues

Solution: If you're experiencing difficulties connecting the device to your Wi-Fi network or MQTT broker, check your network settings and ensure that you're using the correct credentials. Try restarting the device and re-establishing the connection. If the problem persists, contact your network administrator for assistance.

Problem: Menu Navigation Problems

Solution: If you're having trouble navigating the menu options on the OLED screen, check if the control buttons are functioning properly. Clean the buttons and ensure that they are not stuck or obstructed. If the issue continues, try resetting the device to its factory settings.

Problem: Device Freezing or Crashing

Solution: If the device becomes unresponsive or freezes during operation, try restarting it by pressing and holding the power button for 10 seconds. If the problem persists, check for any software updates and install them accordingly. If the issue continues, contact our technical support team for further assistance.

Contact Information:

For technical support or customer service inquiries, please reach out to us via:

Email: support@heartratepro.com

Phone: +1-234-567-8910

Our dedicated team is here to assist you with any questions or concerns you may have regarding your HeartRatePro device. We strive to provide prompt and effective solutions to ensure your satisfaction and continued use of our product.

# Additional information

**Specifications:**

Device Dimensions: 3.5 inches (length) x 2 inches (width) x 0.5 inches (height)

Weight: 50 grams

Display: OLED screen

Connectivity: Wi-Fi

Power Source: Rechargeable lithium-ion battery

Compatibility: Compatible with Pico board and LED monitor

Sensor Type: Optical heart rate sensor

Measurement Interval: Updates heart rate every 5 seconds

Storage Capacity: Stores up to 10 previous measurements

Operating Temperature: 10°C to 40°C

Warranty: 1-year limited warranty

**Glossary:**

BPM: Beats Per Minute, a measure of heart rate

HRV: Heart Rate Variability, the variation in time intervals between heartbeats

PPI: Peak-to-Peak Interval, the time between consecutive peaks in the heart rate signal

RMSSD: Root Mean Square of Successive Differences, a measure of HRV

SDNN: Standard Deviation of Normal-to-Normal Intervals, another measure of HRV

**Warranty:**

HeartRatePro is covered by a 1-year limited warranty against defects in materials and workmanship. This warranty does not cover damage caused by misuse, neglect, or unauthorized modifications.

Feedback Form:

Thank you for choosing HeartRatePro as your trusted partner in monitoring your heart health. We understand the importance of accurate and reliable heart rate measurement, and we are honored that you have entrusted us with this crucial aspect of your well-being.

At HeartRatePro, we are committed to providing you with the highest quality products and services to support your health journey. We value your feedback and strive to continuously improve our products and services. If you have any suggestions, comments, or concerns, please fill out our online feedback form available on our website. Your input is essential in helping us meet your needs and expectations.

Should you have any questions, concerns, or feedback, please do not hesitate to reach out to our dedicated customer support team. We are here to assist you every step of the way and ensure that you have a seamless experience with our device.

Once again, thank you for choosing HeartRatePro. We look forward to being a part of your health and wellness routine and helping you achieve your goals.