

HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY



Faculty of Electronics and Electrical Engineering

Product Requirements Document

HEART RATE MONITOR

Class: TT01

Instructor:

Bùi Quốc Bảo

HO CHI MINH CITY UNIVERSITY OF TECHNOLOGY

Student's ID	Full Name
2151111	Huỳnh Lê Phi Long
2151113	Nguyễn Hồng Long
2151206	Đoàn Hy Khang
2151136	Đoàn Duy Quân

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Table of Contents

Overview 3

Priority Description 3

Product Requirements 3

I. Industrial Design 3

II. Display Screen 4

III. Connectivity 5

IV. Power 5

V. Durability 6

VI. Packaging 7

VII. Out of Box Experience (OOBE) 8

VIII. Security & Privacy 8

IX. Regulations & Certifications 8

X. Serviceability & Warranty 9

Overview

Internal Name	Heart Rate Monitor
External Name	HRM
MSRP (Solo)	200,000 VND – VN, 290 Baht - ThaiLand
Channel	Online Only
Launch Target	March, 2024

The Heart Rate Monitor is a modern device that tracks a user's heart rate in real time and provides insightful data on their fitness and cardiovascular health. This little, easy-to-use device fits in with anyone's daily schedule and makes it easier for them to keep an eye on and take care of their general health.

The Heart Rate Monitor is designed for people who prioritize their health and fitness, appealing to a wide range of customers such as athletes, fitness enthusiasts, and health-conscious consumers. The target demographic is made up of people of all ages, but there is a special emphasis on tech-savvy people who value incorporating cutting-edge technology into their health practices.

Priority Description

P0: Must Have Requirement i.e. Product will not launch without it

P1: Not a requirement for launch but is needed 3-6 months post-launch

Product Requirements

I. Industrial Design

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
I.1	Color, Material, Finish (CMF)	Have a transparency acrylic shell with some waterproof protection. Inside is a red PCB.	P0		
I.2	Dimensions	Should be 2in x 3in	P0		
I.3	Visual Interface	Have 1 OLED displace	P0		
I.4	Button	Allow to chage the	P0		

	Interface	displace by button interactions			
I.5	Connectors	Can only be format by USB to wire by UART module interface.	P0		
I.6	Placement	Small and convinient, can be place on any flat surface.	P0		
I.6	Supporter/Fast ener	The table version will have a rubber supporter to prevent damage the surface when place on, and the hand version will have a strap to fastener it to our hand.	P0		

II. Display Screen

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
II.1	Always On Displays	The display shall always show: <ul style="list-style-type: none"> - Irregular Heart rate - Blood Oxygen - Heart Rhythms 	P0		
II.2	Measurement Instructions	The device features a real-time guided measurement display that automatically activates upon device startup. This intuitive interface provides users with immediate guidance during measurements, ensuring a seamless and user-friendly experience.	P0		
II.3	Display Controls	Display shall be button-enabled with the following	P0		

		controls: <ul style="list-style-type: none"> - ON/OFF - Settings (to change format and color, metrics) 			
II.4	Orientation	Display other relevant information such as exercise duration, calories burned, and sometimes the current time.	P1		

III. Connectivity

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
III.1	Heart Pulse Sensor	By placing a fingertip on the sensor, it can detect the user's pulse and promptly display heart rate.	P0		
III.2	Wire	USB to wire by UART module interface	P0		
III.3	WiFi Frequency Bands	Shall operate on both 2.4GHz and 5GHz	P1		
III.4	Bluetooth	Allowing the devices to sync with smartphones or other devices. This enables users to view and track their heart rate data on dedicated apps.	P1		

IV. Power

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
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IV.1	Power	Using a cable USB to wire by UART module interface connect from PC/Laptop to the circuit with 5V voltage supply supplement	P0		
IV.2	Alternative Power	5V supplement from other voltage source (e.g: pin, ...)	P1		

V. Durability

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
V.1	Humidity	Equipped with two layers of waterproof protection, this device can operate seamlessly at 100% humidity in wireless mode. However, in wired mode, it is recommended to operate under conditions below 90% humidity.	P0		
V.2	Weather Resistant	The device is designed to function reliably in wireless mode with an IPX6 rating. Operation under higher ratings has not been tested yet.	P0		
V.2	Drop Test	Minimize the circuit to prevent physical damage, as a significant	P0		

		drop may result in circuit damage and potential failure.			
V.3	Operating Temperature Range	Shall be fully functional and operational within the range of 32°F (0°C) to 120°F (49°C)	P0		
V.4	Touch Discomfort	Should not produce discomfort, such as sharpness or heat, when touched or held. Compact for convenient carrying and transportation.	P0		
V.5	Lifetime	Shall last for at least 3 years	P0		

VI. Packaging

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
VI.1	In the box	<p>Included in the box are:</p> <ul style="list-style-type: none"> • USB to wire by UART module interface • Guideline book • Heart Rate Monitor module 	P0		
VI.2	On the Box	LLQK Tech Logo Packaging with the addition of the Heart Rate Monitor System	P0		

VII. Out of Box Experience (OOBE)

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
VII.1	Time to Install (Physical Installation)	Shall be physically installed within 5 mins or less	P0		
VII.2	Software/Firmware Setup (For wifi and bluetooth data transmissster)	Overall software setup shall be done in 8 mins or less	P0		

VIII. Security & Privacy

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
VIII.1	WiFi/Bluetooth Security Protocol for Transferring data to Phone/Laptop	WPA-PSK, WPA2-PSK protocols for wifi and SSP, BLE protocols for Bluetooth	P1		
VIII.2	Data Storage and Data Deletion	Ensure that the storage infrastructure meets security standards. Provide users with the option to delete their data in their phone/laptop	P1		

IX. Regulations & Certifications

Here will be all the regions that Heart Rate Monitor will be sold in as well as certifications/compliance tests. Exact tests that need to be done will need to be confirmed with the manufacturing engineers and team.

Assuming this will be launched in the VN and Thailand first, then the certification tests might be :

#	Region	Compliance/Certifications	Priority	Technical/Engineering Specifications	Comments
IX.1	VN	<ul style="list-style-type: none"> • ISO 9001 • ISO 14001:2015 • ISO 45001:2018 • IC 	P0		
IX.2	Thailand	<ul style="list-style-type: none"> • IC • ISO equivalent 	P1		

X. Serviceability & Warranty

#	Feature/Characteristic	Product Requirements	Priority	Technical/Engineering Specifications	Comments
X.1	Warranty - VN and Non-Thailand	Shall have a 1-year Warranty on parts	P0		
X.2	Warranty – Thailand	Shall have a 2-year Warranty on parts	P0		
X.3	Repairs/Returns Process	Shall adhere to the LLQK Tech returns and repair process (link here)	P0		