**HO CHI MINH CITY UNIVERSITY**

**OF TECHNOLOGY**

Faculty of Electronics and Electrical Engineering

Product Requirements Document



**HEART RATE MONITOR**

***Class: TT01***

*Instructor:*

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|  |  |
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# **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**

### **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 Interface | Allow to chage the displace by button interactions | P0 |  |  |
| 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/Fastener | 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 |  |  |

### **Display Screen**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Feature/Characteristic** | **Product Requirements** | **Priority** | **Technical/Engineering Specifications** | **Comments** |
| II.1 | Always On  Displays | The display shall always show:   * 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 controls:   * ON/OFF * Settings (to change format and color, metrics) | P0 |  |  |
| II.4 | Orientation | Display other relevant information such as exercise duration, calories burned, and sometimes the current time. | P1 |  |  |

### **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 |  |  |

### **Power**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Feature/Characteristic** | **Product Requirements** | **Priority** | **Technical/Engineering Specifications** | **Comments** |
| 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 |  |  |

### **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 drop may result in circuit damage and potential failure. | P0 |  |  |
| V.3 | Operating Temperature Range | Shall be fully functional and operational within the range of 32℉ (0℃) to 120℉ (49℃) | 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 |  |  |

### **Packaging**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Feature/Characteristic** | **Product Requirements** | **Priority** | **Technical/Engineering Specifications** | **Comments** |
| VI.1 | In the box | Included in the box are:   * 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 |  |  |

### **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 transmisster) | Overall software setup shall be done in 8 mins or less | P0 |  |  |

### **Security & Privacy**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Feature/Characteristic** | **Product Requirements** | **Priority** | **Technical/Engineering Specifications** | **Comments** |
| VIII.1 | WiFi/Bluetooth Security Protocol for Transfering 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 |  |  |

### **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 | * ISO 9001 * ISO 14001:2015 * ISO 45001:2018 * IC | P0 |  |  |
| IX.2 | Thailand | * IC * ISO equivalent | P1 |  |  |

### **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 |  |  |