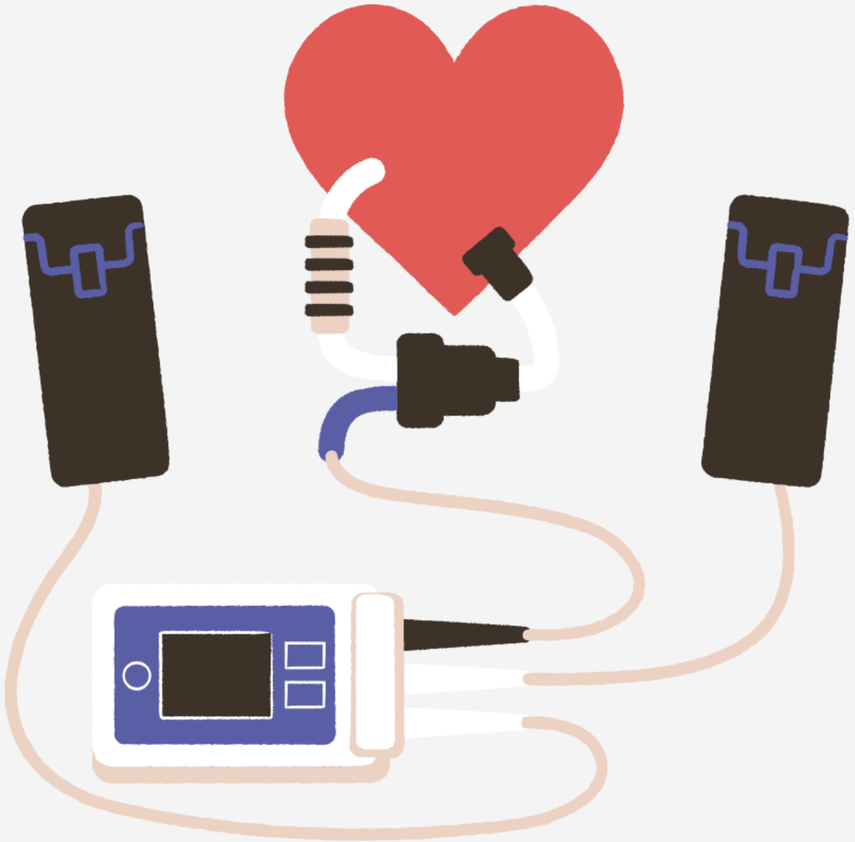
# PulseCare



**"Peace of Mind, Every Beat"**

E/20/192 Karunarathne AGSI
E/20/418 Wahalathantri TN
E/20/440 Wickramsinghe RT

# Problem

## Cardia Care Gap

- Doctors only see patient data during hospital visits.
- Current care often relies on patients reporting symptoms after they occur, rather than capturing precautionary data to prevent incidents.
- Patient Isolation: High-risk patients often feel anxious and disconnected from medical oversight when recovering at home.

# Solution


Core Concept: A compact wrist-worn device that continuously tracks Heart Rate and $SpO_2$ and bridges the gap between patient and guardian via BLE.

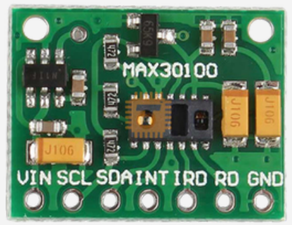
Key Value Proposition:

- **Continuous Monitoring**: Non-invasive tracking of vital signs.
- **Instant Alerts**: Emergency SOS button for immediate help.
- **Remote Connectivity**: Seamless data sync to a mobile app.

# System Architecture

## Input

MAX30100 Sensor
+
Button Input




## Process

ESP32-C3 Super Mini

## Output

OLED Display
+
BLE Transmit


## Receiver

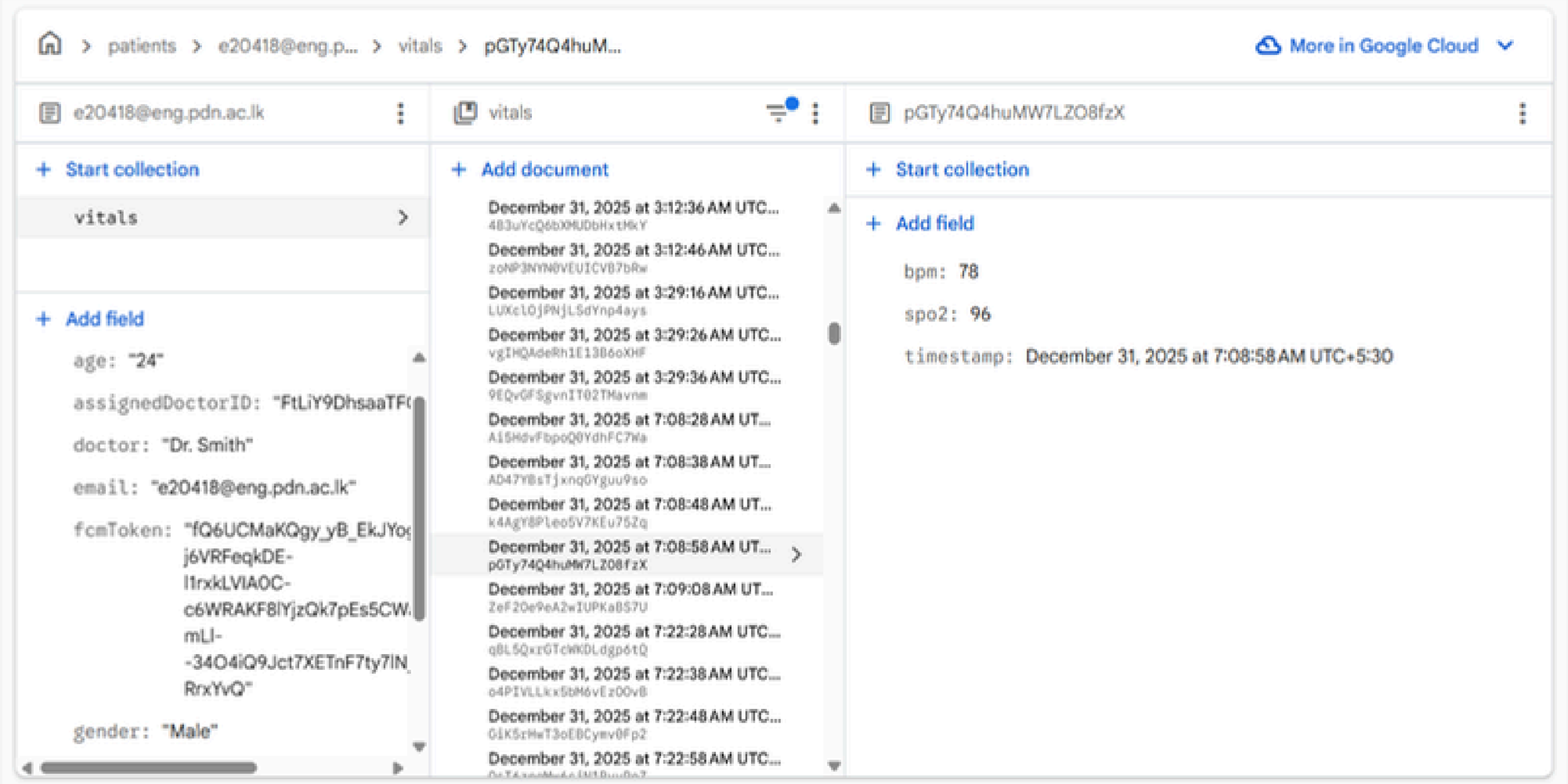
Android App
+
Web Portal

android studio

Cloud Firestore

# Demonstration

# FireStore

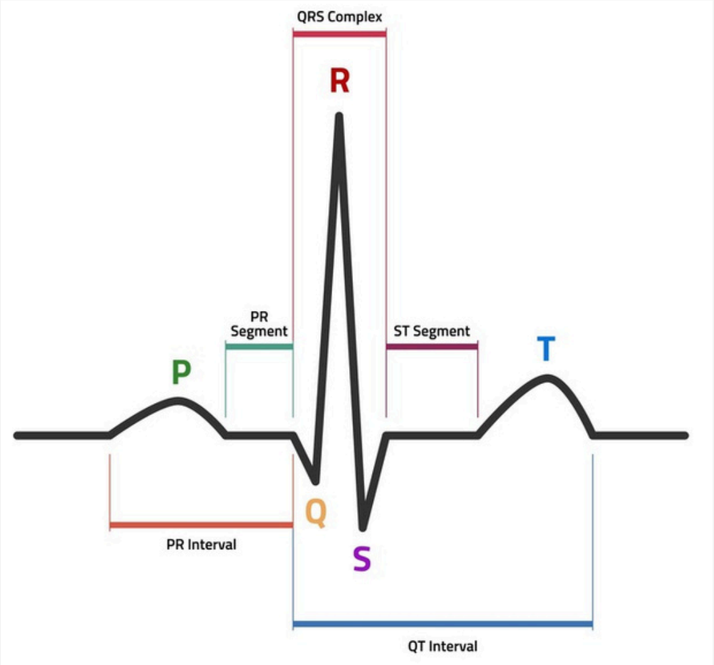

patients > e20418@eng.p... > vitals > pGTy74Q4huM...
More in Google Cloud
e20418@eng.pdn.ac.lk
vitals
pGTy74Q4huMW7LZO8fzX
+ Start collection
vitals
+ Add field
age: "24"
assignedDoctorID: "FtLiY9DhsaaTF
doctor: "Dr. Smith"
email: "e20418@eng.pdn.ac.lk"
fcmToken: "fQ6UCMaKQgy_yB_EkJYo
j6VRFeqkDE-
l1rxkLVlA0C-
c6WRAKF8lYjzQk7pEs5CW
mLI-
-34O4iQ9Jct7XETnF7ty7lN
RrxYvQ"
gender: "Male"
+ Add document
December 31, 2025 at 3:12:36 AM UTC...
4B3uYcQ6bXMUDbHxtMkY
December 31, 2025 at 3:12:46 AM UTC...
zoNP3NYN0VEUICVB7bRw
December 31, 2025 at 3:29:16 AM UTC...
LUXclOJPNjLSdYnp4ays
December 31, 2025 at 3:29:26 AM UTC...
vgIHQAdeRh1E13B6oXHF
December 31, 2025 at 3:29:36 AM UTC...
9EQvGFSgvnIT02TMavnm
December 31, 2025 at 7:08:28 AM UT...
AI5HdvFbpoQ0YdhFC7Wa
December 31, 2025 at 7:08:38 AM UT...
AD47YBsTjxnqOYguu9so
December 31, 2025 at 7:08:48 AM UT...
k4AgY8PleoSV7KEu75Zq
December 31, 2025 at 7:08:58 AM UT...
pGTy74Q4huMW7LZO8fzX
December 31, 2025 at 7:09:08 AM UT...
ZeF2Oe9eA2wIUPKaBS7U
December 31, 2025 at 7:22:28 AM UTC...
qBL5QxrGTcWKDLdgp6tQ
December 31, 2025 at 7:22:38 AM UTC...
o4PIVLLkx5bM6vEzOOvB
December 31, 2025 at 7:22:48 AM UTC...
GiK5rHwT3oEBCymv0Fp2
December 31, 2025 at 7:22:58 AM UTC...
+ Start collection
+ Add field
bpm: 78
spo2: 96
timestamp: December 31, 2025 at 7:08:58 AM UTC+5:30

# Budjet

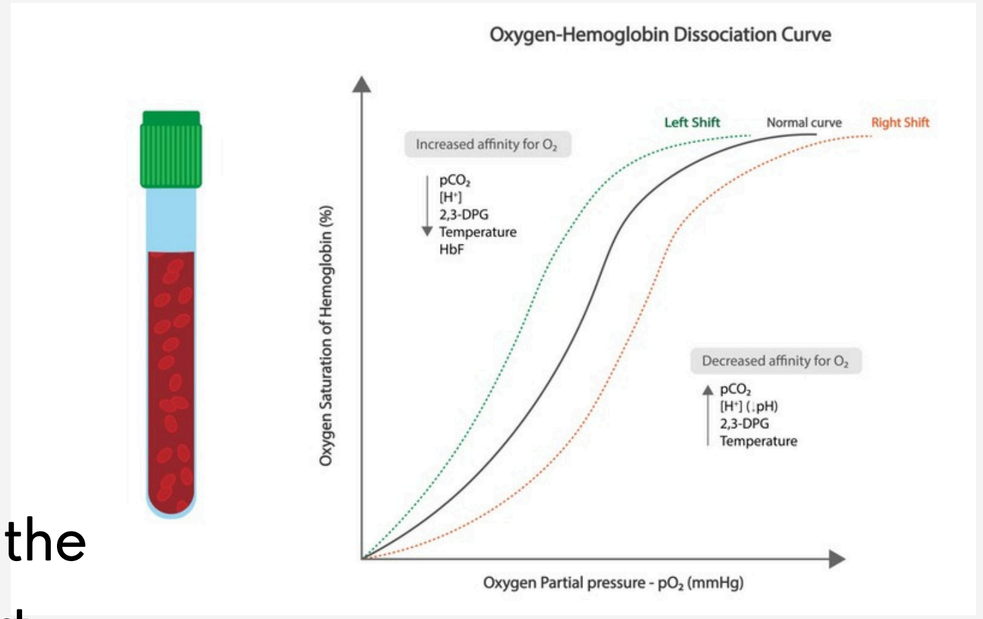
| Component | Unit Price (LKR) |
|---|---|
| 3.7 V Li-Po ion battery | 880 |
| ESP32-C3 Super Mini | 730 |
| MAX30100 Sensor | 290 |
| TP4056 Charger IC | 80 |
| 0.96" OLED 128×64 White | 590 |
| Button and Switch | 60 |
| Enclosure print | 600 |
| Package & Label design | 300 |
| Wires, Resistors, Capacitors, LED bulbs | 100 |
| Total Cost | **3630** |

# Heart Rate

- Uses Photoplethysmography (PPG) to detect blood volume changes in the microvascular bed of tissue.
- Normal Range: 60 – 100 BPM (Resting).
- Critical Detection: PulseCare identifies abnormal spikes (tachycardia) or drops (bradycardia) to trigger alerts.



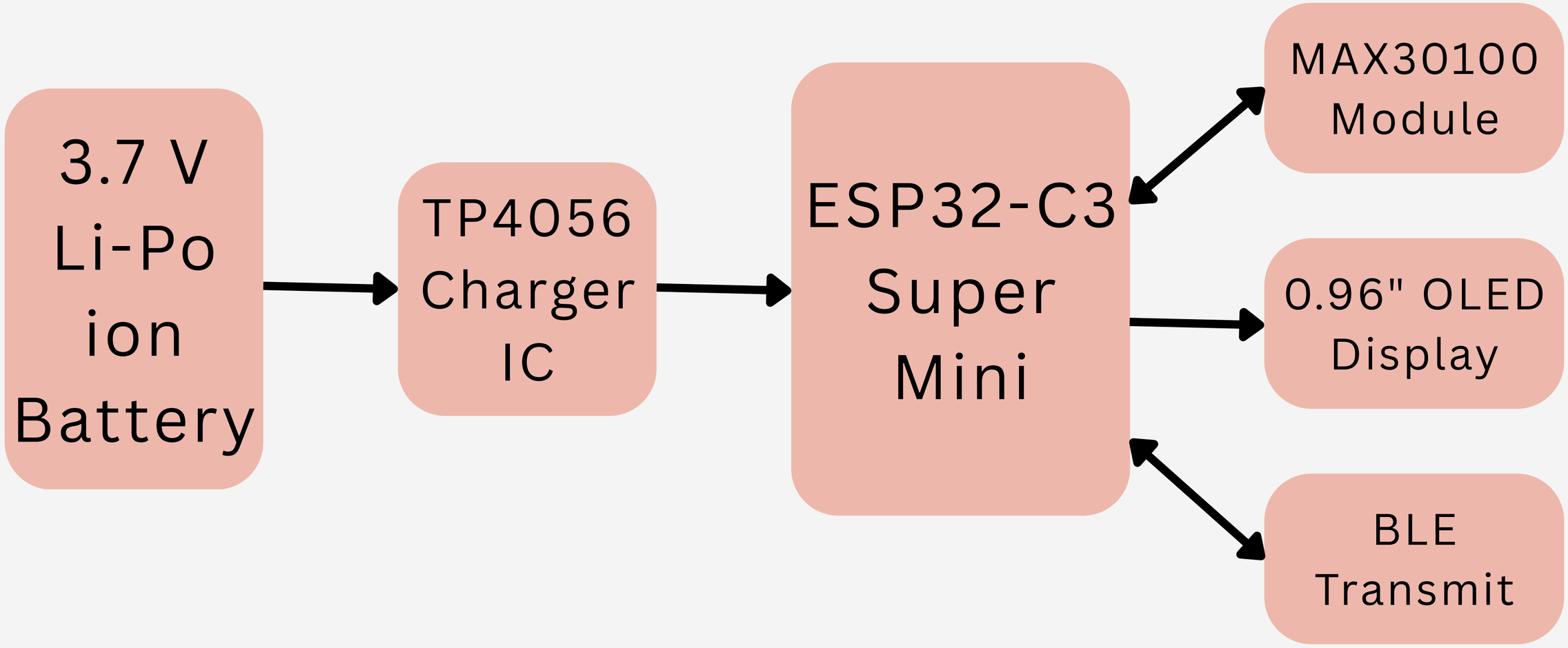
# SpO2



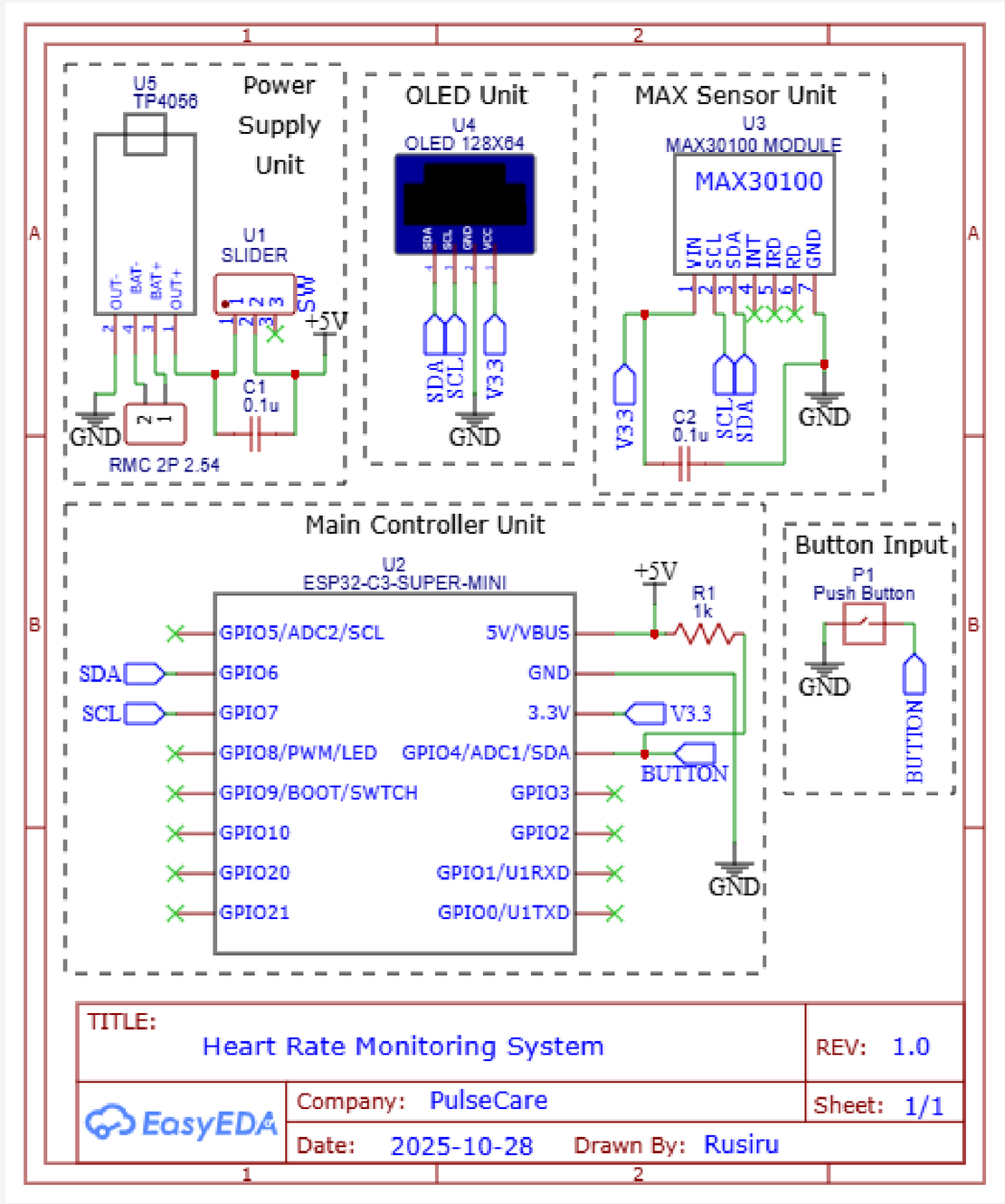

$SpO_2$ measures the percentage of hemoglobin in the blood that is oxygenated. It acts as a direct report card for respiratory and cardiac efficiency.

- Healthy Range: 95% – 100%.
- Hypoxia Warning: Values below 90% indicate insufficient oxygen supply to the brain and organs.

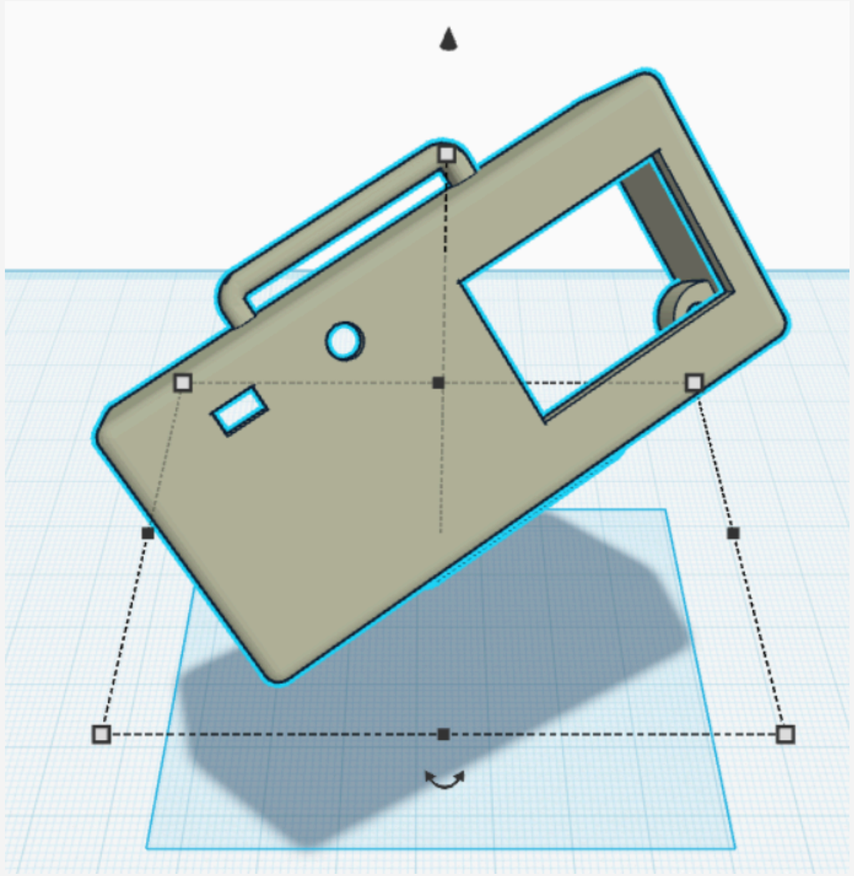
# White Box Analysis

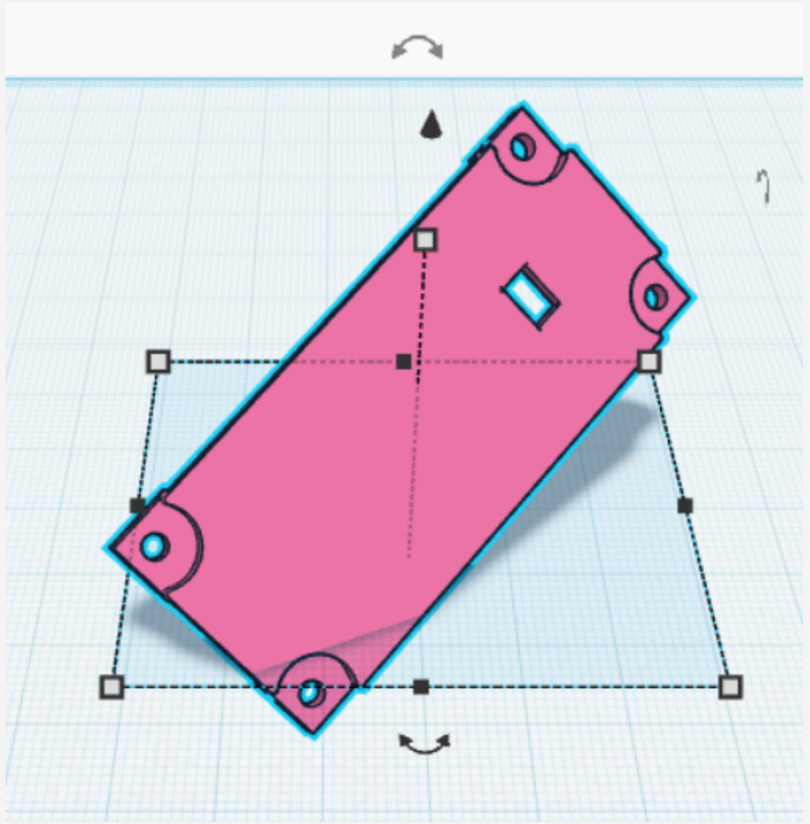


# Schematic


Power Supply Unit
U5
TP4056
OUT-
BAT-
BAT+
OUT+
U1
SLIDER
SW
+5V
C1
0.1u
GND
RMC 2P 2.54
OLED Unit
U4
OLED 128X64
SDA
SCL
GND
VCC
SDA
SCL
V3.3
GND
MAX Sensor Unit
U3
MAX30100 MODULE
MAX30100
VIN
SCL
SDA
INT
IRD
RD
GND
V3.3
C2
0.1u
SCL
SDA
GND
Main Controller Unit
U2
ESP32-C3-SUPER-MINI
GPIO5/ADC2/SCL
GPIO6
GPIO7
GPIO8/PWM/LED
GPIO9/BOOT/SWTCH
GPIO10
GPIO20
GPIO21
5V/VBUS
GND
3.3V
GPIO4/ADC1/SDA
GPIO3
GPIO2
GPIO1/U1RXD
GPIO0/U1TXD
SDA
SCL
+5V
R1
1k
V3.3
BUTTON
GND
Button Input
P1
Push Button
GND
BUTTON
TITLE:
Heart Rate Monitoring System
REV: 1.0
EasyEDA
Company: PulseCare
Sheet: 1/1
Date: 2025-10-28
Drawn By: Rusiru

# Enclosure Design





# Thank you!