

# Body Temperature And Blood Oxygen Level Monitoring Device

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**ABSTRACT:** *Temperature and Blood oxygen level is one of the most important parameters of the human body. A lot of health issues are depending upon Body temperature and blood oxygen level. There are various types of devices are available to measure those parameters. But still, it leads to a lot of problems like high cost, size, accuracy, and more. To made a solution for this problem, a plan to develop a project as low cost, compact size, and high accuracy. In this project was using MAX30100, MPU6050, Arduino, OLED, and buzzer to detect the body temperature and blood oxygen level. Body temperature and blood oxygen was a major factor for most of the illness occurs in body. But if it was frequently monitoring, it could able to control it. Before, it turned into a serious issue. After the pandemic, need to take care of temperature and blood oxygen level. So, this project would be useful to detect and monitor those parameters.*

**KEY WORDS:** *Temperature sensor, Blood oxygen level sensor, Arduino, OLED display.*

## 1. INTRODUCTION

The body had certain temperature to maintain itself as warm. If it lost its balanced temperature, then there is a problem with the body. So, checking the body temperature was important. The body had the property of kept temperature within a safe range, even though the outside temperature changes a lot. When the body was too hot, the blood vessels in the skin widen to carry the excess heat to the skin's surface. When the immune system detected a virus in the body, it sent the signals to the Hypothalamus, which created the heat, fever, a hot and hostile environment that weakened the body. If the temperature was higher than 100 degrees Fahrenheit, it would indicate that the body was fighting with some infection. By frequently monitoring the body temperature can help to detect illness. Traditionally, body temperature was measured in either the axilla or rectum. Most guidelines on fever management are based on rectal temperatures [12]. Blood oxygen level was a measure of how much oxygen our red blood cells are carrying. Our body closely regulated our blood oxygen level. Oxygen was not only important for the respiration process, but also for the brain, cell, and blood circulation. Imbalance in blood oxygen led to confusion, headache, chest pain, and rapid heartbeat. So, measuring our blood oxygen level would help to know about the body condition.

## 2. EXISTING SYSTEM AND PROPOSED SYSTEM

### A. Existing system model 1:

The existing system model one was used to measure the temperature of human body. The MAX30205 temperature sensor was used in this application. This sensor had some disadvantages like high cost and also this sensor is not a contactless temperature sensor.

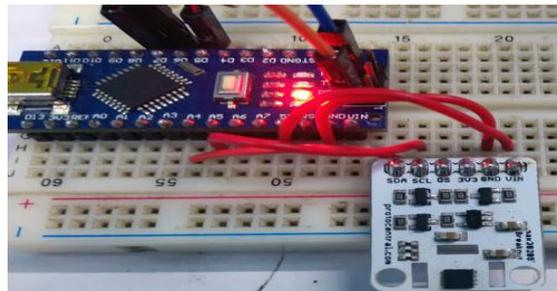


Figure 1: Existing system model 1

### B. Existing system model 2:

The existing system model two is used to measure the blood oxygen level. In the application, they used a pulse oximeter to measure and monitor. This application had some disadvantages like lack of efficiency.

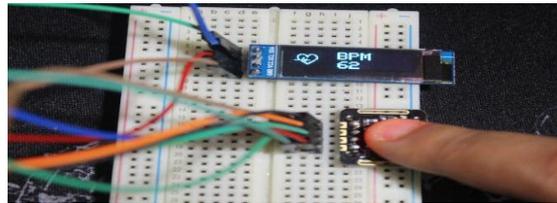


Figure 2: Existing system model 2

### PROPOSED SYSTEM:

This paper provided a platform for the measurement of temperature and Blood oxygen level at low cost, which may have helpful for the public to do analysis on their own. The main objective of this project was to measure the body Temperature and Blood oxygen level from their remote location during this COVID period using a low-cost device. In this paper, the MPU6050 and MAX30100 sensors would compare the normal values with the current temperature and the Blood oxygen level. If temperature and blood oxygen level are normal it will be indicated it as normal. Whenever any one of the parameters went to the abnormal condition it would give an indication through buzzer sound or any other display devices. Data could be accessed by the patient himself, by doctor or patient's family members [2].

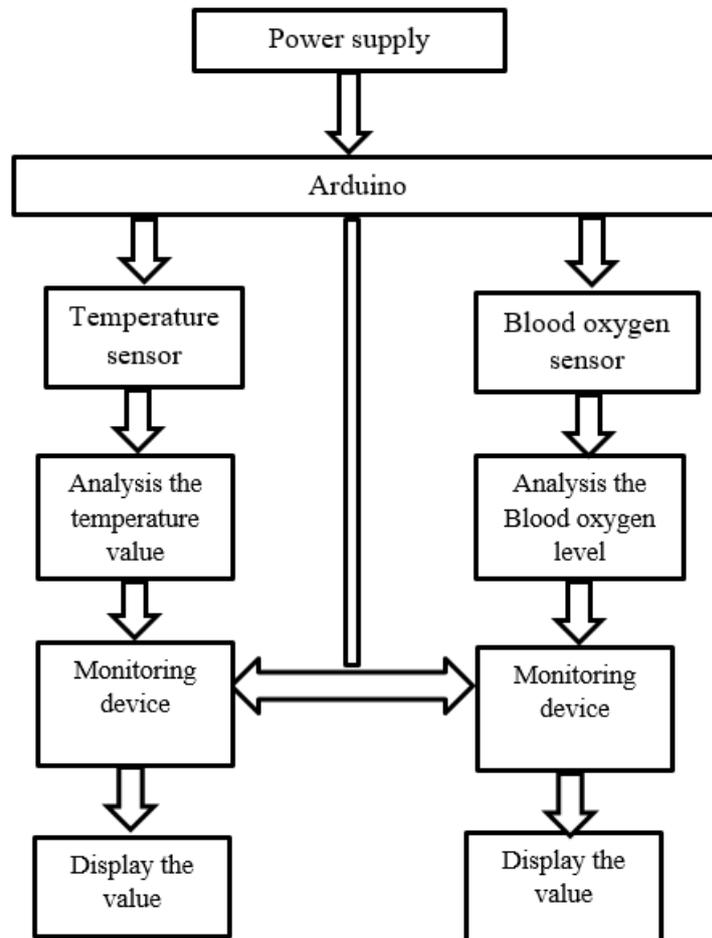


Figure. 3 Block diagram of proposed system

### 3. MATERIALS AND METHODS

#### A. Arduino Nano:

Arduino Nano board was a powerful board combined with low power architecture. It was small and robust board. It embedded with a 9-axis inertial sensor which made this board ideal for wearable devices. It had 20 digital I/O pins and 12 analog input pins. The difference between Arduino Nano and Arduino Uno was size. Arduino with Ethernet shield had been used for that purpose. Test results can be monitored by the patient in the home itself as well as for the doctor in the remote location itself [3]. Because Arduino Uno size was double the Arduino Nano. And also, the programming of Uno was often through with Uno cable and Nano with Nano cable.

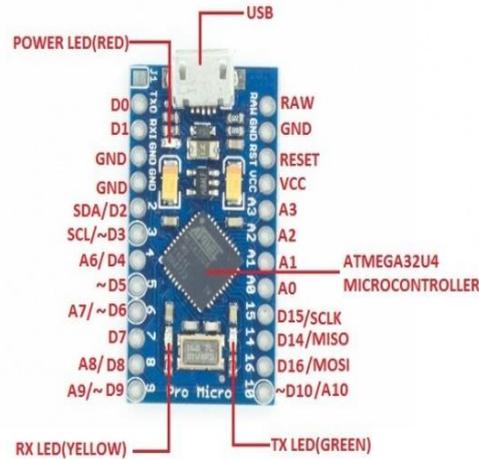


Figure 4: Arduino Nano

**B. MAX30100 Sensor:**

It was an integrated pulse oximetry sensor. This sensor consisted of two LEDs. The first one was Red and the one was Infrared. The coordinated chip MAX30100, which could work on the circuit configuration, decrease framework impression, lessen the planning time and framework power utilization [17]. The MAX30100 sensor had some devices that read the values from emitting two wavelengths of light from two LEDs a red and an infrared one. Then it would measured the absorbance of pulsing blood through a photodetector.



Figure 5: MAX30100 Sensor

**C. MPU6050 Sensor:**

MPU6050 sensor was usually used in motion processing devices. It could be able to measured the temperature of human body. It was called as world first six dimension motion tracking device. The data can be analysed which was received from different sensor nodes with various distance such as 10cm, 20cm, 30cm and 40cm [1]. It would capture motion in X, Y and Z axis at the same time.

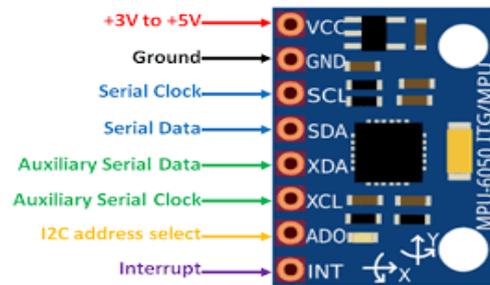


Figure 6: MPU6050 Sensor

#### D. OLED Display:

OLED was defined as Organic Light Emitting Diode. This technology was used in LEDs in which the light was produced by organic molecules. This OLED does not need a backlight like conventional LCD/ LED lights[26][27][28]. This type of organic material had a property known as Electroluminescence (EL), which could help the material glow when stimulated by a current or an electric field[29][30]. This type of display panel was considered the best energy-saving display[31-34].



Figure 7: OLED display

#### E. Buzzer:

A buzzer was an electromagnetic, electromechanical, magnetic, mechanical, electro-acoustic or piezoelectric audio signalling device. Piezoelectric buzzer was driven by an oscillating electronic circuit and by any another audio signal source. A click, beep, or ring, would indicate that a button had been pressed.

### 4. RESULT AND DISCUSSION:

This was a sample output of the project. OLED display was showing the value of the temperature, Blood oxygen level and pulse rate. If the Temperature and Blood oxygen level was not in normal level, it would indicate to the patient.



Figure7: Body temperature and blood oxygen level monitoring device output



Figure8: Body temperature and blood oxygen level monitoring device output

## 5. CONCLUSION AND FUTURE SCOPE:

The past few years had witnessed an increased in the development of wearable sensors for health monitoring systems.[5]The presented smart and Low-cost Temperature and Blood oxygen level monitor was small, compact and advanced technology in the medical field. Here continuously body temperature and blood oxygen level were monitored. This could be done by measuring the level of temperature and Blood oxygen level in human body. This method was used to overcome the high-cost measuring system of temperature and blood oxygen level system. By using this device one can frequently check their body condition was in good condition or not. They don't need to go hospital daily to check their current condition. Being in home itself we can analyse our data regarding health. If we found any changes in the reading or data collected you could immediately go to the hospital for further clarifications.Because, Temperatureand Blood oxygen level was the most talked topics in every aspect of our life. After that pandemic scenario, we should check those parameters regularly.

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