



Khulna University of Engineering & Technology

Department of Electronics & Communication Engineering

COURSE NO: 3200

COURSE TITLE: ELECTRONICS PROJECT DESIGN LAB

PROJECT NAME: COVID-19 DITECTION

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Aim of the Design:

COVID-19 is a disease caused by the SARS-CoV-2 virus that primarily attacks a person's respiratory system. Some milder symptoms can include fever, aches, and chills, but it can also lead to more serious conditions such as pneumonia. A person who has pneumonia or even slight shortness of breath might not know when to go to a hospital, especially as they start to get even more overwhelmed. This is why I created this open source pulse oximeter, which can assist in getting people the help they need and get accurate information about their current condition.

Aim of the Design:

1. It will measure heart beat and oxygen level
2. No moving part so it is durable
3. Low cost so anyone can buy
4. Easy to integrate other functionality
5. No complexity, easy to use

Components:

In order to design a pulse oximeter based smart COVID-19 detection system, we need following components-

- Arduino Nano R3
- Maxim integrated MAX30102
- OLED 128X64 Display

Necessary Online Apps:

- **An Arduino IDE:** The Arduino Integrated Development Environment - or Arduino Software (IDE) - contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the Arduino and Genuino hardware to upload programs and communicate with them.
- **Autodesk Fusion 360:** Fusion 360 is a cloud-based 3D modeling, CAD, CAM, CAE, and PCB software platform for product design and manufacturing.

Circuit Configuration:

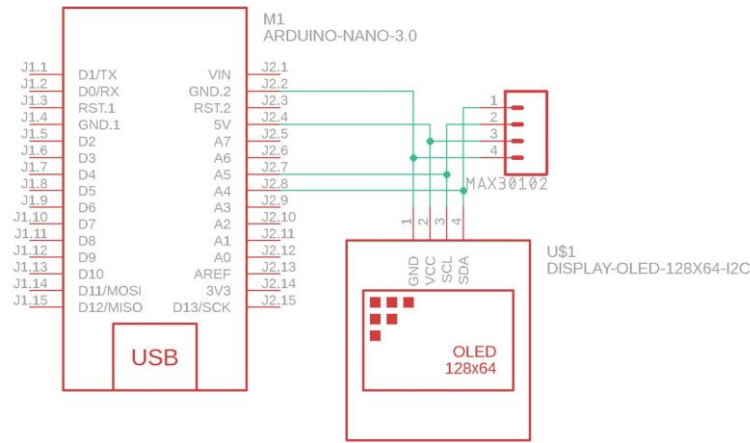


Fig-1: Pulse oximeter circuit configuration

Description & Analysis:

MAX30102: The MAX30102 is an integrated pulse oximetry and heart-rate monitor module. It includes internal LEDs, photodetectors, optical elements, and low-noise electronics with ambient light rejection. The MAX30102 provides a complete system solution to ease the design-in process for mobile and wearable devices. The MAX30102 operates on a single 1.8V power supply and a separate 3.3V power supply for the internal LEDs. Communication is through a standard I2C-compatible interface. The module can be shut down through software with zero standby current, allowing the power rails to remain powered at all times

128x64 Pixel OLED: This tiny 0.96 inch OLED display has a resolution of 128 x 64 pixels and uses a standard (configurable) serial interface for communication. Based on the SSD1306 controller. By default the module is configured to use an SPI interface for serial interface but can be modified (soldering required) to communicate via I2C protocol (see note). Pre-written libraries for Arduino are freely available.

Arduino Nano R3: The Arduino Nano is a small, complete, and breadboard-friendly board based on the ATmega328P released in 2008. It offers the same connectivity and specs of the Arduino Uno board in a smaller form factor.

The Arduino Nano is equipped with 30 male I/O headers, in a dip-30 like configuration, which can be programmed using the Arduino Software integrated development environment (IDE), which is common to all Arduino boards and running both online and offline. The board can be powered through a type-b micro-USB cable, or through a 9V battery.

Cost Analysis:

Table-1: Required hardware

Serial No	Name	Price Per Piece (Tk)	Quantity
01	Arduino Nano R3	540	01
02	MAX30102	200	01
03	128x64 pixel OLED	550	01
	Total	1290(tk)	

Conclusion:

This project is all about helping vulnerable potential COVID-19 patient to improve their current situation. It will help to take precaution if there is a potential corona patient in a family. We have a plan to integrate this project to a app so that we can collect data from a neighbourhood so that people of that neighbourhood can be aware.

Because of the current lock down situation, every tech shop is off for a while. we decided to do more of a software base project so that we can continue develop our project. We also thought about improving the lockdown situation. We tried to use less hardware as it is hard to get now.