COVID19 SAFETY SYSTEM: DOOR HANDLE SANITIZER & TEMPERATURE DETECTION

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PROBLEM STATEMENT/OBJECTIVE

- The motive of the project is, too much hand sanitization is not good for human body as it may cause irritations and can be poisonous if consumed. Instead of hand sanitization if door knobs and objects are automatically sanitized it would increase efficiency to curb the spread of new influenza virus which is transmitted by hand contact.

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LITERATURE SURVEY

Sr. No.	Title	Authors	Year of Publication	Algorithm	Aim
1	Automatic Water Level Controller with Short Messaging Service (SMS) Notification	Sanam Pudasaini, Anuj Pathak, Sukirti Dhakal, Milan Paudel	2014	Despite being the smart system there are many rooms for improvement, which when considered, this system can be more smart ultimately user being smarter.	The project was carried out to assist user in load shedding based country like Nepal. SMS notification was added to automatic controller system so that water can be managed by user during load shedding.
2	Self-Activating Sanitizer With Battery Imposed System For Cleansing Hands	Mr. M. M. Srihari	2020	The motor pumps the sanitizer liquid or solution to the human while detecting the IR Sensor.	Implementing of Contactless Automatic Hand Wash Dispenser for Sanitation is efficient and the cost price is minimized.

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LITERATURE SURVEY

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3	Design and Implementation of a Smart Hand Sanitizer Dispenser with Door Controller using ATMEGA328P	Enerst Edozie, WantimbaJ anat, Zaina Kalyan kolo	2020	The smart hand sanitizer is stationed at the entrance door and it is connected to the door in such a way that it controls it	The main objective of this research paper is to design and implement a low cost touch free smart hand sanitizer dispenser with door controller that includes features such as ultrasonic sensor, LCD display and servo motor, based on Microcontroller.
4	Measurement of Temperature and Humidity by using Arduino Tool and DHT11	Deeksha Srivastava1, Awanish Kesarwani, Shivani Dubey	2018	This paper proposes a cost -friendly and efficient, humidity and temperature monitoring system, which can be easily used in industrial and agronomic sector.	To measures room temperature and humidity using an Arduino board, based on Atmega328P using the sensor HDC1080 from Texas Instrument.

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5	A gsm based intelligent wireless mobile patient monitoring system	Shahin Mahmud, Md Morshed Alam, Joynal Abedin, Saikat Roy	2014	Implement a GSM based system using microcontroller and LM35 sensor which is low-cost and use-friendly	Monitoring one's heart rate and body temperature continuously from a remote area is impossible for a medical expert by using typical monitoring devices

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BLOCK DIAGRAM

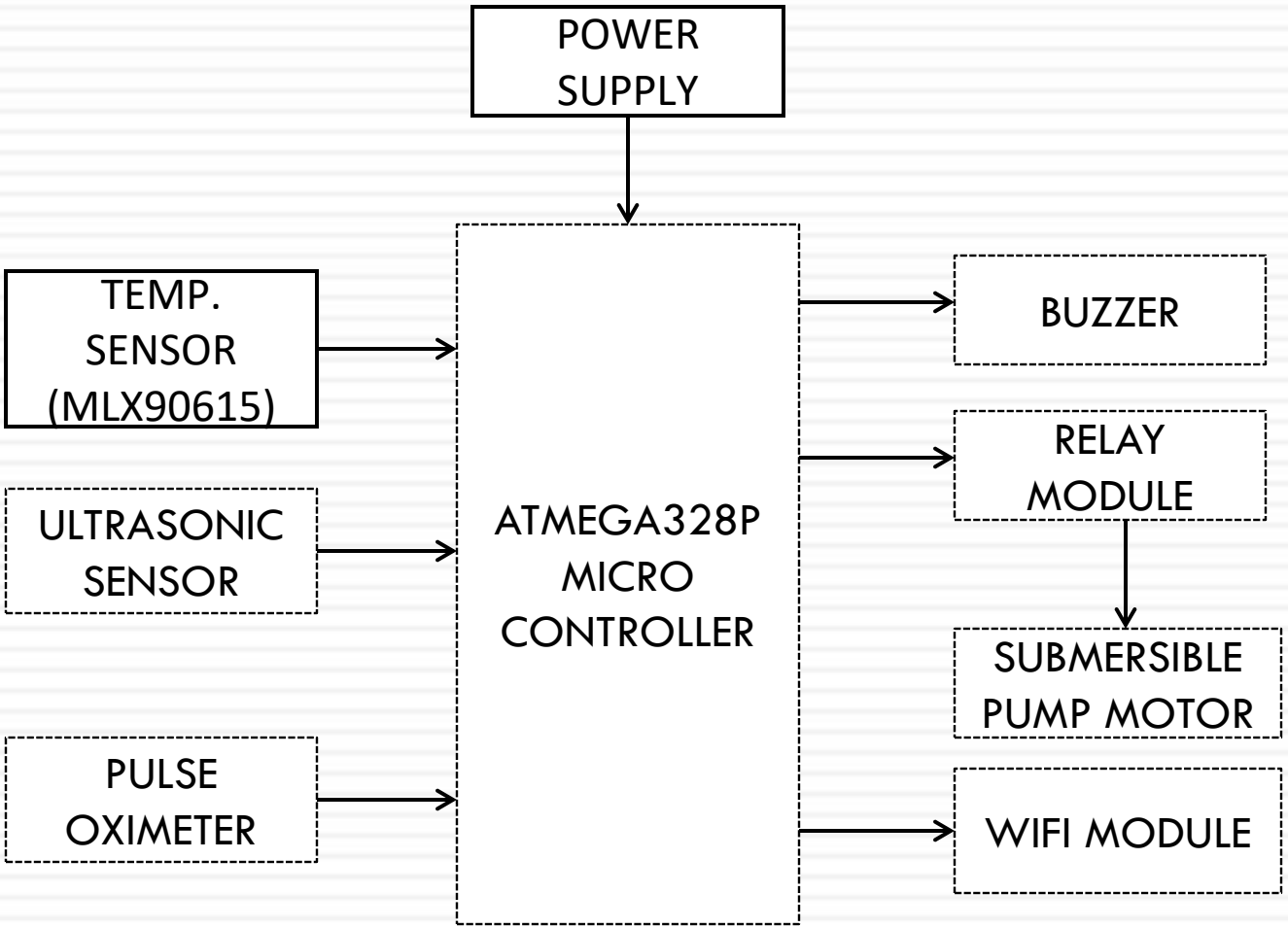
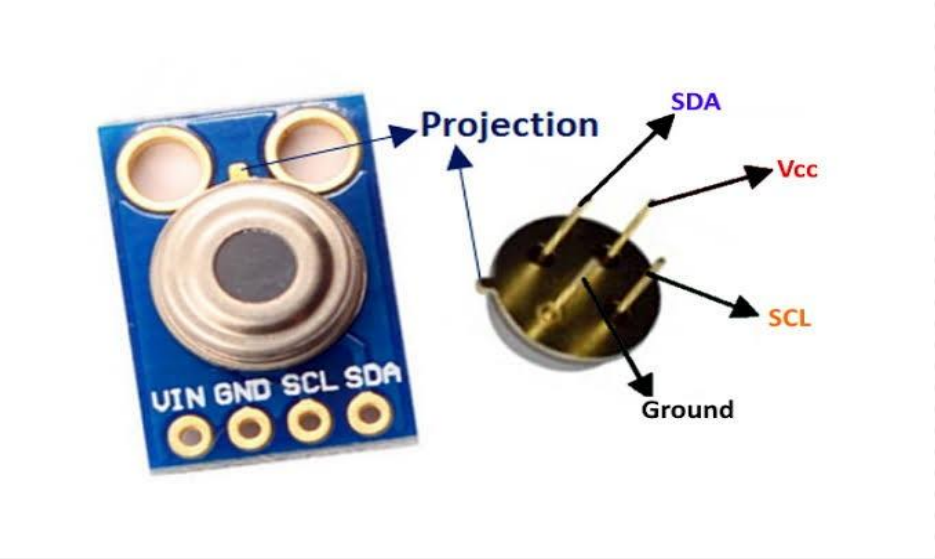


Fig. 1 Block Diagram of System

- Power Supply :- A power supply is an electrical device that supplies electric power to an electrical load. The primary function of a power supply is to convert electric current from a source to the correct voltage, current, and frequency to power the load.

- Temperature sensor :- A temperature sensor is an electronic device that measures the temperature of its environment and converts the input data into electronic data to record, monitor, or signal temperature changes.



- Ultrasonic Sensor :- It is an elctronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal.

- Microcontroller :- An integrated circuit that contains a microprocessor along with memory and associated circuits and that controls some or all of the functions of an electronic device or system.

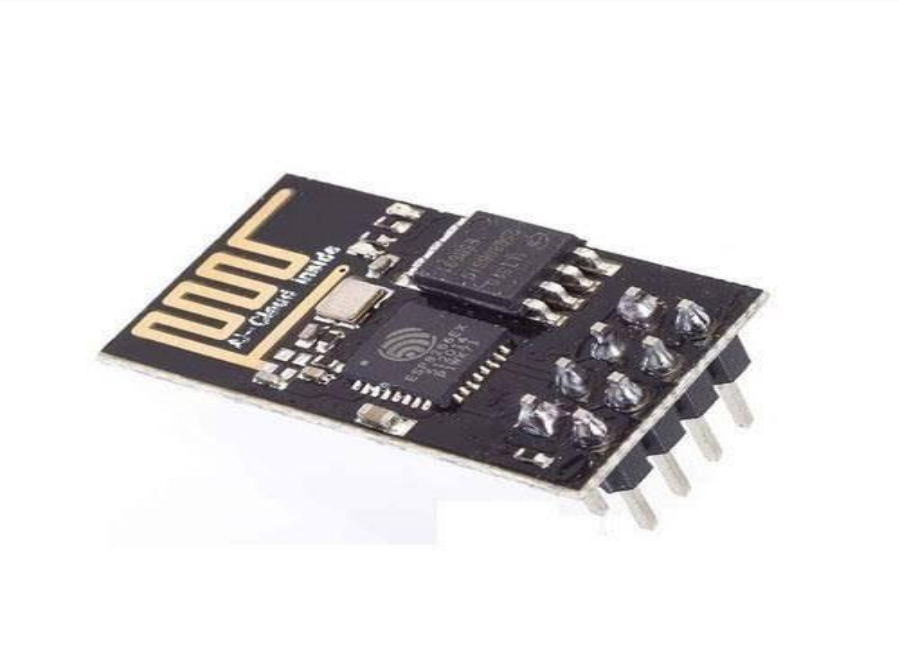
- Pulse Oximeter :- It is a noninvasive and painless test that measures our oxygen saturation level, or the oxygen levels in our blood.

- Buzzer :- It is an electrical device that makes a buzzing noise and is used for signalling.

- Relay Module :- It is a separate hardware device used for remote device switching.

- Submersible Pump Motor :- It is a pump that can be fully submersed in water. The motor is hermetically sealed and close-coupled to the body of the pump.

- WIFI Module :- It is a self contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your wifi network.



SPECIFICATIONS OF PROJECT

- Microcontroller IC: AVR ATMEGA328P
- DC Submersible pump motor: 9V DC
- Non-contact Temperature Sensor: MLX90614
- Ultrasonic Sensor: HC-SR04
- Pulse Oximeter Module: MAX30100
- Wifi Module: ESP8266
- Relay module: 5V Single channel

- Software: ARDUINO IDE :v1.8.13
- Simulation: Proteus v7
- Application Required: Blynk (legacy)

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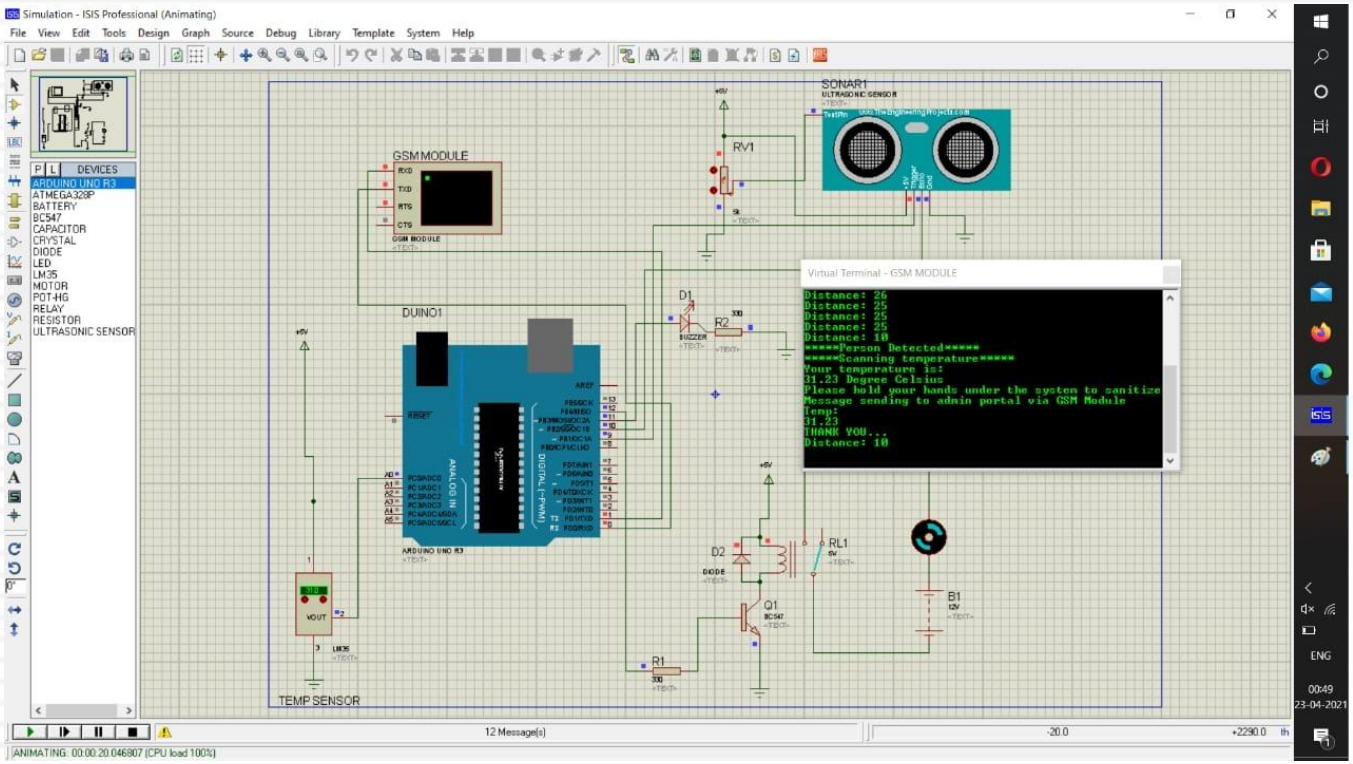
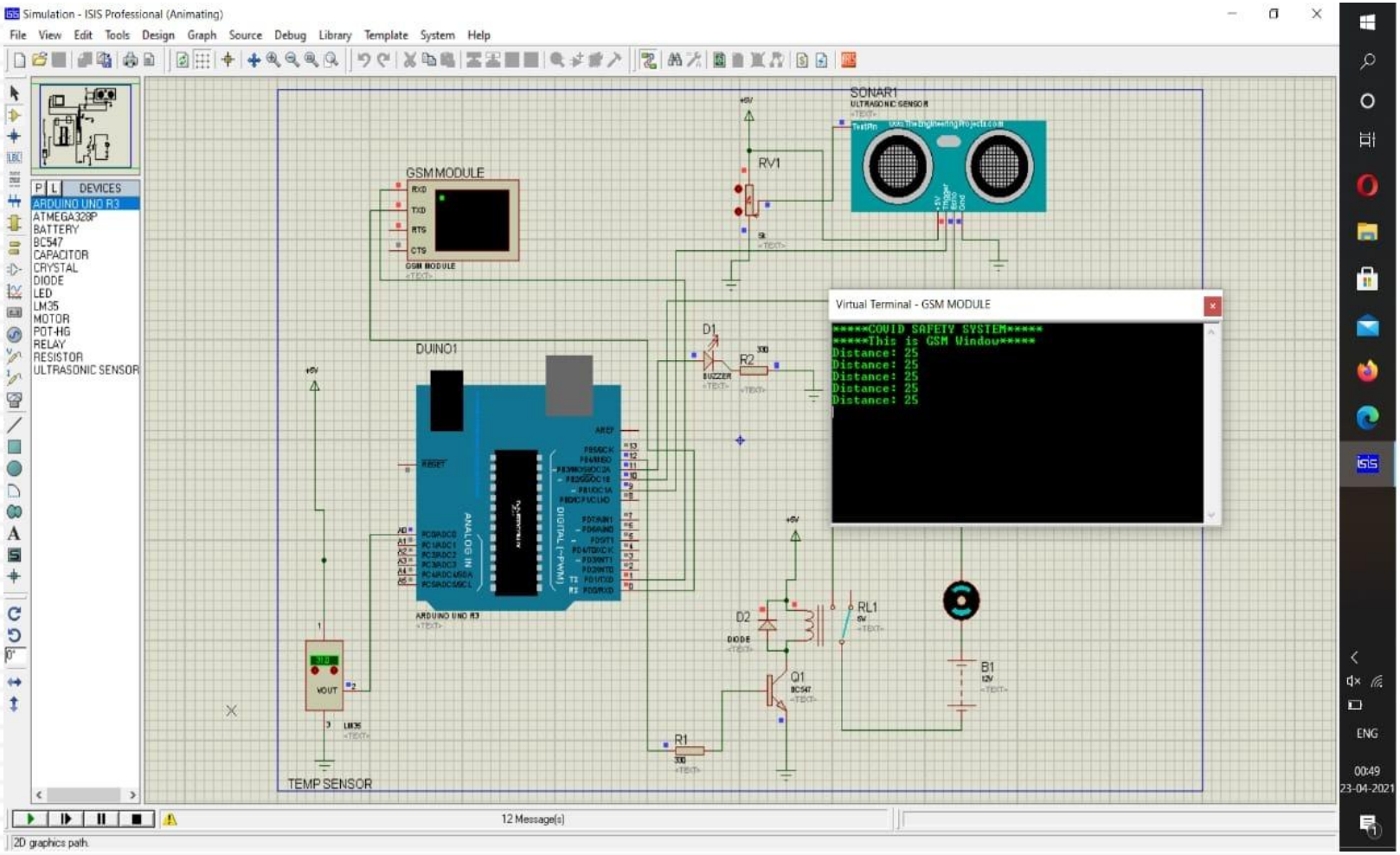
RESULTS





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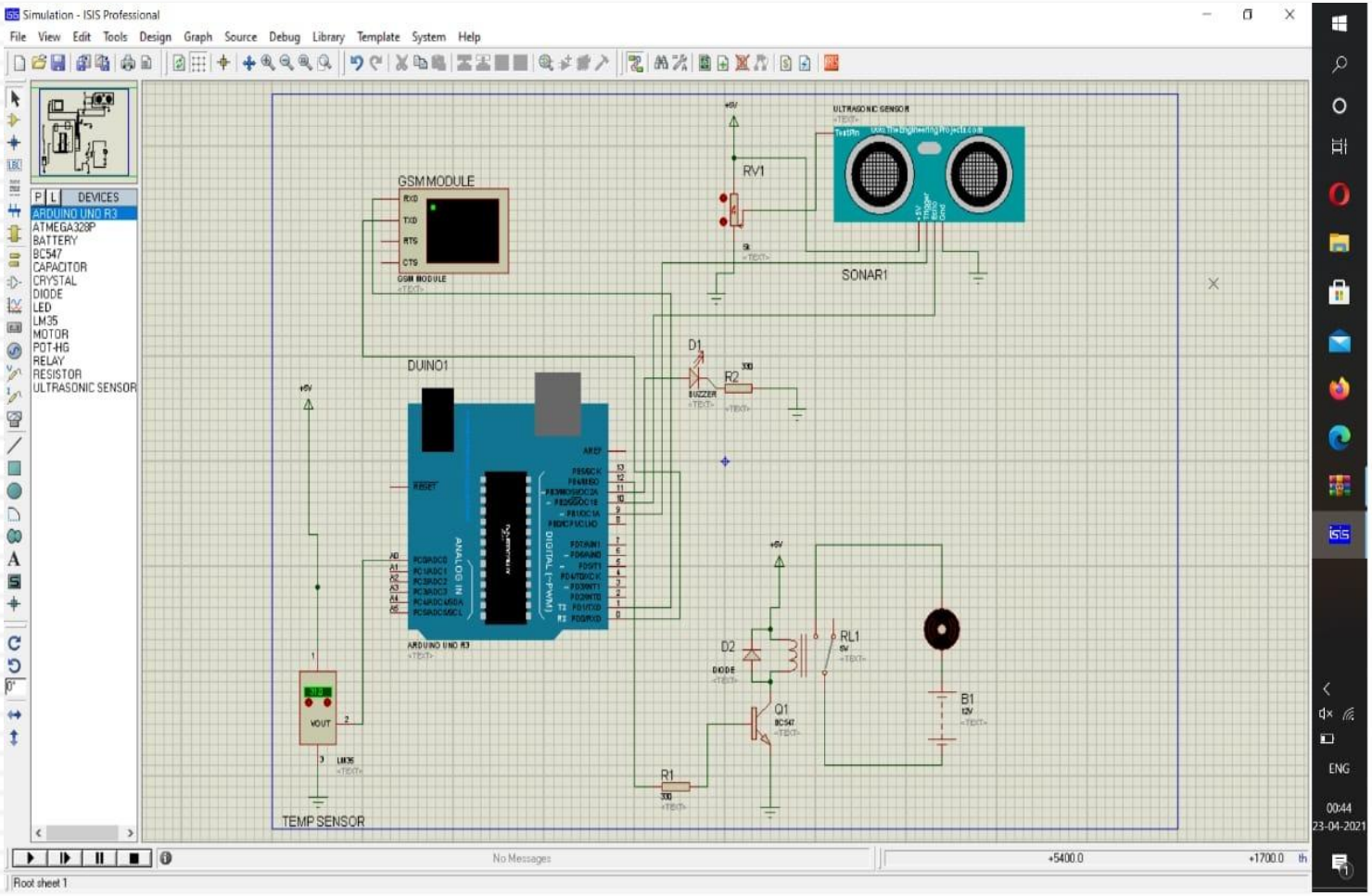

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HARDWARE RESULTS

5.3 Voltage and current specification:

5.3.1 ATMEgA328P

• Operating Voltage:
– 1.8 - 5.5V for ATmega328P
• Temperature Range:
– -40°C to 85°C
• Low Power Consumption at 1 MHz, 1.8V, 25°C for
– Active Mode: 0.3 mA
– Power-down Mode: 0.1 µA
– Power-save Mode: 0.8 µA (Including 32 kHz RTC)

5.3.2 MAX30100

•Ultra-Low Shutdown Current: (0.7µA, typ)
•Continuous Input Current into Any Terminal: ±20mA
•VDD = 1.8V, VIR_LED+ = VR_LED+ = 3.3V, TA = +25°C

HARDWARE RESULTS

5.3.3 MLX90615

- Factory calibrated in wide temperature range:
- 40…85˚C for sensor temperature and
- 40…115˚C for object temperature
- High accuracy of 0.5°C over wide temperature range (0...+50°C for both TA and TO)
- High (medical) accuracy calibration
- Measurement resolution of 0.02°C

5.3.4 ULTRASONIC

- Supply voltage: 5V (DC)
- Supply current: 15mA.
- Modulation frequency: 40Hz.
- Output: 0 – 5V (Output high when obstacle detected in range).

HARDWARE RESULTS

5.3.5 Relay 5V

- Trigger Voltage (Voltage across coil): 5V DC.
- Trigger Current (Nominal current) : 70mA.
- Maximum AC load current: 10A @ 250/125V AC.
- Maximum DC load current: 10A @ 30/28V DC.

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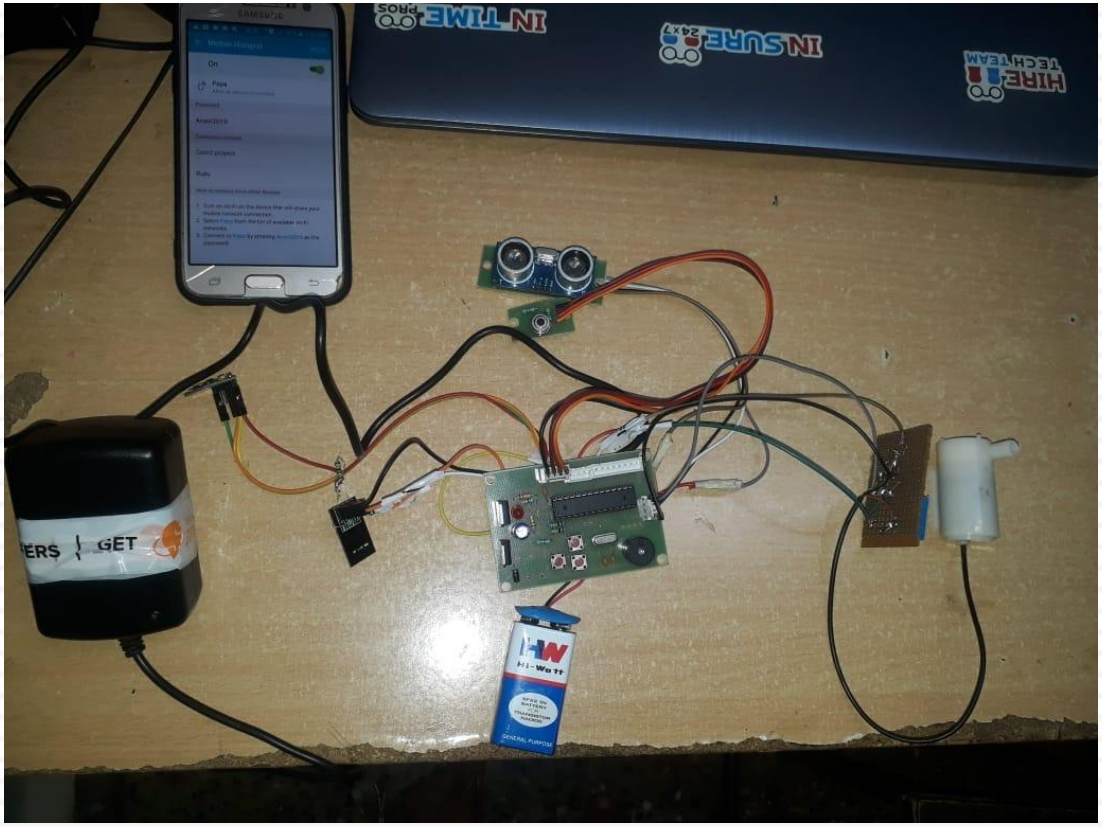
OUTPUT IMAGE OF HARDWARE COVID KIT



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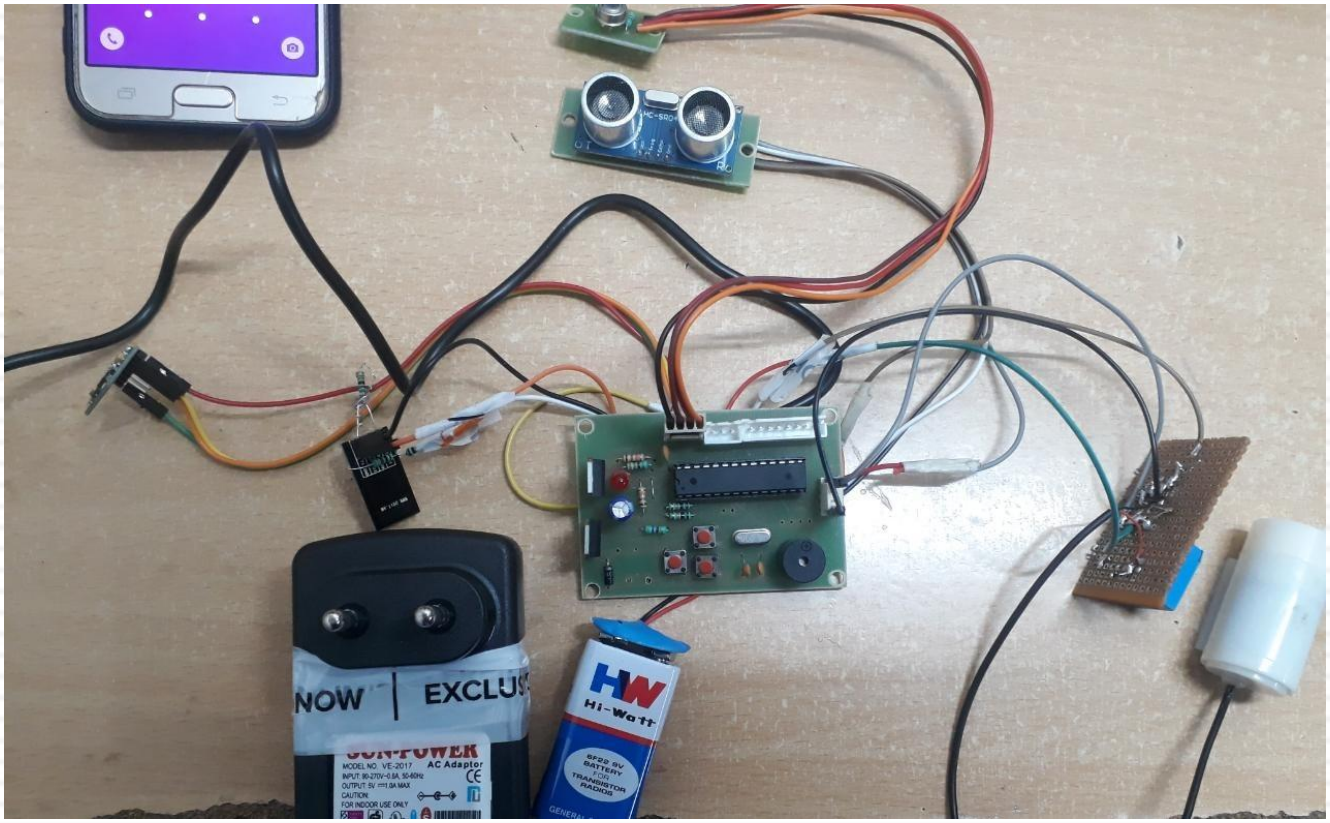
OUTPUT IMAGE OF HARDWARE COVID KIT



ADVANTAGES

- The product is for worldwide use in areas where the risk of infection is high. Public areas such as shopping centers and shared spaces are projected to have the most significant customers.
- These buildings, which can see hundreds of individuals, will be made significantly safer. Constant disinfecting of door handles dramatically reduces the chance of contracting a virus such as COVID-19 via surface contact.
- This development is shown to be significant through the importance of track-and-trace in the battle against COVID-19.

LIMITATIONS

- Storage of liquid sanitizer might be a limitation for our system.
- Poor metallic storage container is very armful for user.

APPLICATIONS

- This device can be used in places like hospitals where there is a need to disinfect the surfaces and also in public places like railway stations, airports, offices etc to eliminate the surface bioburden and hence resulting in improved hygiene and reduction in infections.
- The device we have built will be able to work efficiently to disinfect door knobs/handles and can improve the results of reducing germicidal issues.
- This device will help in reduce health-care associated infections rates to a good extent.

CONCLUSION

- Our model ‘Temperature monitoring system with built in sanitising system’ is proposed considering the human life at risk of the covid-19 infection spreads. This is fully automatic, use of this hybrid system at the entrance of the various crowded places can reduce the man work who is also subjected to risk. Spread of infection is under control due to no contact. Since controlling the doors are also automated, it is ensured that every individual follows the rules accordingly.
- This is a cost efficient and an all-in-one model and hence does not require any multiple systems to support the model. This model suits the need for every organization to maintain the temperature record of the employees daily along with automatic intimation to the higher authority in case of increased temperature of any individual through the GSM module which is a great advantage.

FUTURE SCOPE

- In future, we can use IOT concept to store large amount of people's data on server which is needed in offices, institutes, etc.
- By providing camera interfacing to tis system, we can also store user's image along with his/her temperature and oxygen reading to the server.

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