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Certificate

This is to certify that **Ms. Kulkarni Ankita.K., Kumbhar
Sakshi.J., Potdar Radhika.U., Tondare Supriya.S.** Roll No
22,24,26,60. of **5th** Semester of Diploma in **Electronics Engineering** of
Institute, PURANMAL LAHOTI GOVT POLYTECHNIC, LATUR
(Code:0016) has completed the **CPP PROJECT** satisfactorily in Subject-
CPP (22058) for the academic year 2020-2021 as prescribed in the
curriculum.

Place: **Latur**

Enrollment No:

Date :

Exam Seat No:

.....

Subject Teacher

Principal

Head of Department



Puranmal Lahoti Government Polytechnic

Latur (Maharashtra)

DEPARTMENT OF ELECTRONICS ENGINEERING

TOUCHLESS SMART SANITIZER DISPENSER AND TEMPERATURE
SYSTEM

Capstone Project (22058) Report On A Project Planning Report In partially
fulfilment diploma in Electronics Engineering

Guided By:- Mr.S.L.Thorat
(Lect.EX.Dept.PLGPL)

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This is certify that **Ms. Kulkarni Ankita.K., Kumbhar Sakshi.J., Potdar Radhika.U., Tondare Supriya.S** .From **Puranmal Lahoti Government Polytechnic Latur** having Enrollment Nos. **1800160214, 1800160216, 1800160219, 1900160499**. has completed Project Planning Report having title “ TOUCHLESS SMART SANITIZER DISPENSER AND TEMPERATURE SYSTEM ” in a group consisting of **Four** Candidates under the guidance of the. **Mr.S.L.Thorat**.

Name of Guide:- Mr.S.L.Thorat sir
(Lect.EX.Dept.PLGP Latur)

Name of HOD:- Dr.K.M. Bakwad sir
(Principal PLGP Latur)

Acknowledgement

It is our privilege to express our sincere regards to our project guide, **Mr.S.L.Thorat sir** for their valuable inputs, able guidance, encouragement, whole-hearted cooperation and constructive criticism throughout the duration of our project. We deeply express our sincere thanks to our Head of Department **Dr.K.M.Bakwad sir** for encouraging and allowing us to present the project on the topic “ **Touchless smart sanitizer dispenser and temperature system**“ at our department premises for the partial fulfilment of the requirements leading to the award of Diploma in Electronic Engineering. We take this opportunity to thank all our lecturers who have directly or indirectly helped us for our project. We pay our respect and love to our parents and all other family members and friends for their love and encouragement throughout our career. Last but not the least we express our thanks to our friends for their cooperation and support.

Abstract

The design depicted shows the preventive measure that can be taken during the COVID-19 pandemic in the whole world. Sanitizers have become the most significant commodities right now. By the new rules and regulations given by WHO vigorous sanitization is needed to survive. The design gave the solution for the problem stated. The design introduces an automatic hand sanitizer and temperature sensing system, to keep the hand sanitized whenever a person wants to do it, without a contact with the sanitizing machine. The temperature sensor on touching gives the body temperature of the person.

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CHAPTER 1

1.1 Introduction

Since December 2019 the world is under tremendous tension , the numbers are increasing day by day, and till date no vaccine has been full proved against the pandemic agent. Yes it is COVID-19, it was unknown to the race before it outbreaked in Wuhan, China. Being from a large family , a continuous mutation is occurring , forbidding the researchers, microbiologist , pharmaceuticals to draw the line of conclusion on the vaccine. Affecting the most prestigious countries in a chain ; China , Italy ,Spain , USA , India , Russia, [1] the virus has proved it's strength and subservient a technologically enhanced race. The race of homo-sapiens. The policies taken worldwide has lessen its affect to some extent but could not eradicate it. Lockdown has economically weaken many nations , and testing of different medicines has also not proven to be satisfactory. The question now prevail is Life vs. Livelihood. The weaker section of the society is facing the hardship due to vigorous lockdown across the nations. Seeing the picture of India, one of the most promising countries in technology , the laborers are rushing for a little piece of grain. The starving faces reveal the pain. Industries are in losses , workers are losing jobs, economical growth of the nation has taken a back seat , but it should be realized that a regular monitoring of body temperature and periodical hand sanitization can prevent the spread of the pandemic to the masses. Keeping in mind, the situation worldwide, sanitization commodities should be installed in each and every corner of the sphere , be it an industry , a corporate office , an educational institute or an shopping mall. In this research work , an automatic hand sanitizer with temperature sensing design prototype has been made.

CHAPTER2

2.1 Literature Survey

TOUCHLESS SMART SANITIZER DISPENSER AND TEMPERATURE SYSTEM

In, the paper mainly says about the hospital grasped infections, which is about 2 Million Patients per year and also says that it is 8th leading cause for deaths annually in USA. It also says that handwashing is important and also effective with proper hand washing steps, but washing with soap and water is time consuming for peak hours in hospitals. This paper also showed the effectiveness of the alcohol based hand sanitizers, which reduced infection rates by whopping 30%. They used hand sanitizers with 60 to 70 percent ethanol or isopropanol for reducing significant number of pathogens. The patients were also given about ounce containers of hand sanitizer alongside their beds.

For 10 month period of using hand sanitizers showed a result of 36.1% infection reduction. In, the paper says about the infection caused by drug resistant micro-organisms which causes increase in death rate and also complications, the multidrug resistant bacteria includes Methicillin Resistant Staphylococcus aureus(MRSA), Extended Spectrum Beta-lactamase (ESBL) producing bacteria, Multidrug Resistant Pseudomonas aeruginosa(MDRP), which are very common worldwide. Several antibiotics have increasing multidrug bacteria isolation rate, even personal protection equipment(PPE) can't be effective in isolation rate of MSRA.

Hence they emphasize about the use of alcohol based hand sanitizers since the alcohol based hand sanitizers had negative association with MRSA

isolation rate, which means that hand hygiene is very important in hospitals.

It says about emergence of the novel Coronavirus (SARS-CoV-2), which has caused unexpected challenges to health of the people of this world, the paper also aims at reducing the transmission rate of the disease. The paper explains about the virus structure and how is it different from that of the bacterial structure, which means that virus has single stranded or double stranded RNA or DNA encapsulated in 'capsid' and virus can replicate only in presence of a host and described as 'living entities'. Bacteria also has almost the same structure including DNA or RNA along with 'Cell Membrane' and can replicate without a host. The paper also gives a complete comparison between hand sanitizers and soap, foam vs gel, and it says that high concentration of ethanol can reduce the amount of virus particle present in the hand and hence proves the effectiveness of alcohol based hand sanitizer.

3.CHAPTER3

3.1 Methodology

BLOCK DIAGRAM:

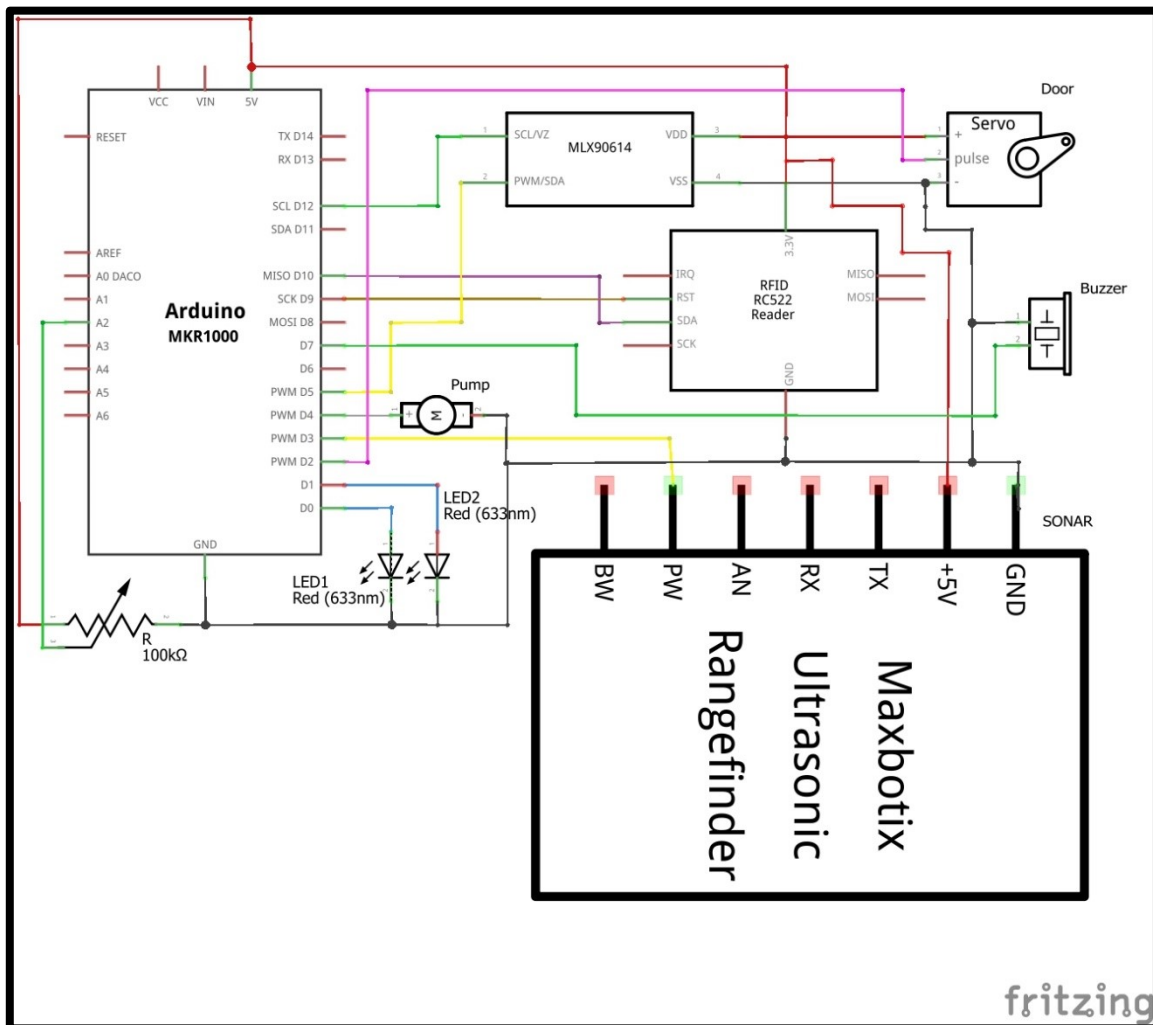
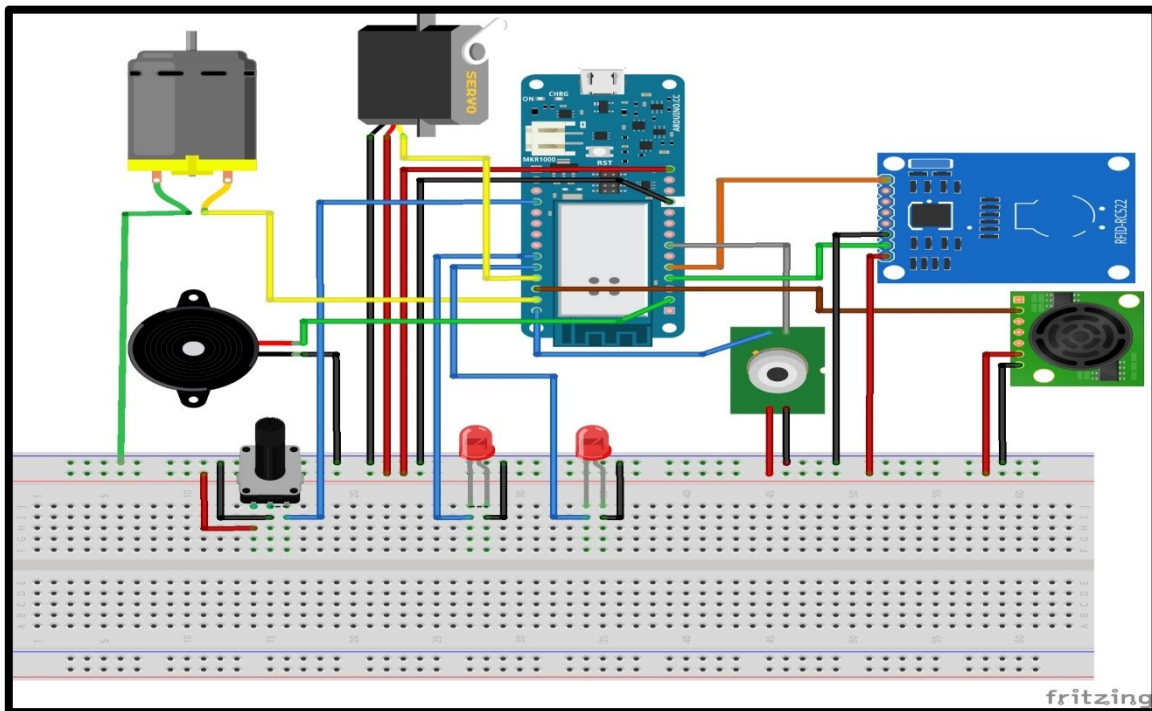


Fig 1-circuit schematic

Hygiene refers to the practices conducive to maintaining health and preventing disease especially through cleanliness such as washing hands, coughing in the elbow etc. Hand washing helps to prevent any diseases that spread through contact. In order to eliminate most of the germs on the hands, we need to apply a good hand washing practice. In most healthcare settings, alcohol-based hand sanitizers are preferable to hand washing with soap and water because it can be easily tolerated and it is also more effective at reducing bacteria. Hand sanitizer is a liquid, gel, or foam generally used to decrease infectious agents on the hands. A sanitizer is designed to kill germs on skin, objects and surfaces.

- **Circuit Diagram & Working**



It is based on ARDUINO MKR 1010 wifi (Micro-controller), Thermal temperature sensor and Ultrasonic rangefinder sensor (an ultrasonic sensor is used to check the presence of hands below the outlet of the sanitizer machine), RFID (attendance if you are an employee) that can help to solve the challenges faced by security guards at different stations such as bank doors, school gates, hospital gates etc.

In enforcing this hand sanitizing action before letting people in to where ever they intend to enter as some people are not willing to collaborate, some look at it as a wastage of their time and also sometimes security guards can let some people in without sanitizing and without check body temperature just because they are their friends or family or relatives, which is very risky. Therefore, 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. That is to say, when a person(s) wants to access the entrance door, they must first sanitizer their hands or else the door will remain locked. With smart hand sanitizer dispenser, if you are employee first put Your RFID tag near RFID scanner

after that put hand under smart sanitizer then the sanitizer outlet dropping some amount into your hands at that time thermal temp sensor automatically check body temperature, If temperature is normal it commands to the micro-controller to turn on the servo motor and it will open the entrance door and allow a person to enter and lighting up a green LED and in the other case if temperature is high so it will indicate RED led and beep a buzzer. Otherwise, the door will neither unlock nor open but a Both LED will continuously blink and send your Entry time, date and your Body temperature data in a google sheet with all personal details. so admin will monitor all employee details through google sheet.

We are also able to get attendance system in this smart hand sanitizer. So need to use that old fingerprint scanner machine and all. Just ID card will work.

With Help of This smart sanitizer no need to touch anything. So it is true to say “TOUCH LESS DO MORE”

3.2 Components List

a) Arduino MKR 1010 Wifi:

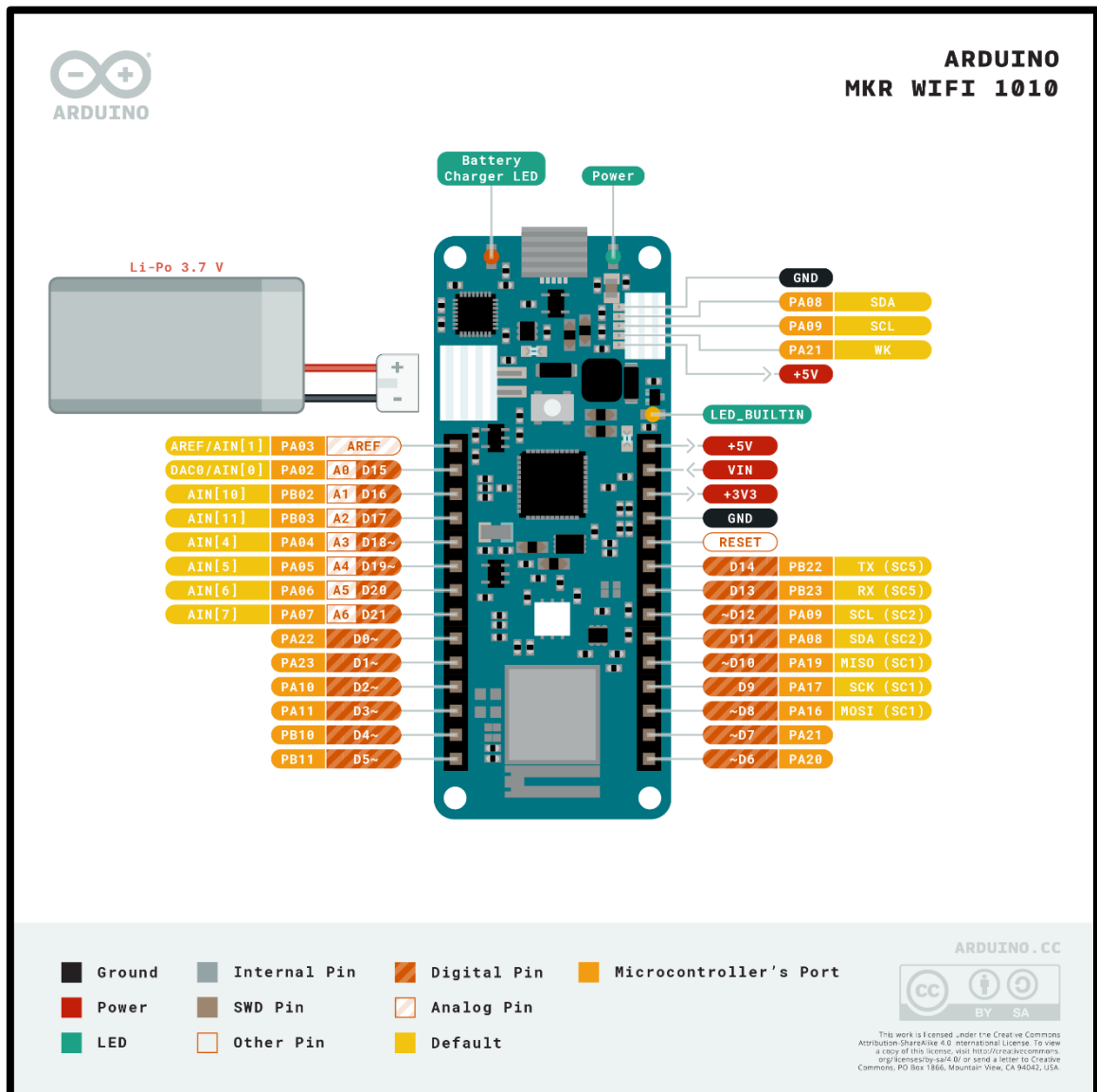


Fig 3- Pin diagram of Arduino MKR WIFI 1010

a) Arduino MKR WIFI 1010

Arduino MKR1000 has been designed to offer a practical and cost effective solution for makers seeking to add Wi-Fi connectivity to their projects with minimal previous experience in networking. It is based on the Atmel

ATSAMW25 SoC (System on Chip), that is part of the SmartConnect family of Atmel Wireless devices, specifically designed for IoT projects and devices.

The ATSAMW25 is composed of three main blocks:

SAMD21 Cortex-M0+ 32bit low power ARM MCU

WINC1500 low power 2.4GHz IEEE® 802.11 b/g/n Wi-Fi

ECC508 CryptoAuthentication

The ATSAMW25 includes also a single 1x1 stream PCB Antenna.

b) MLX90614 INFRARED TEMPERATURE SENSOR

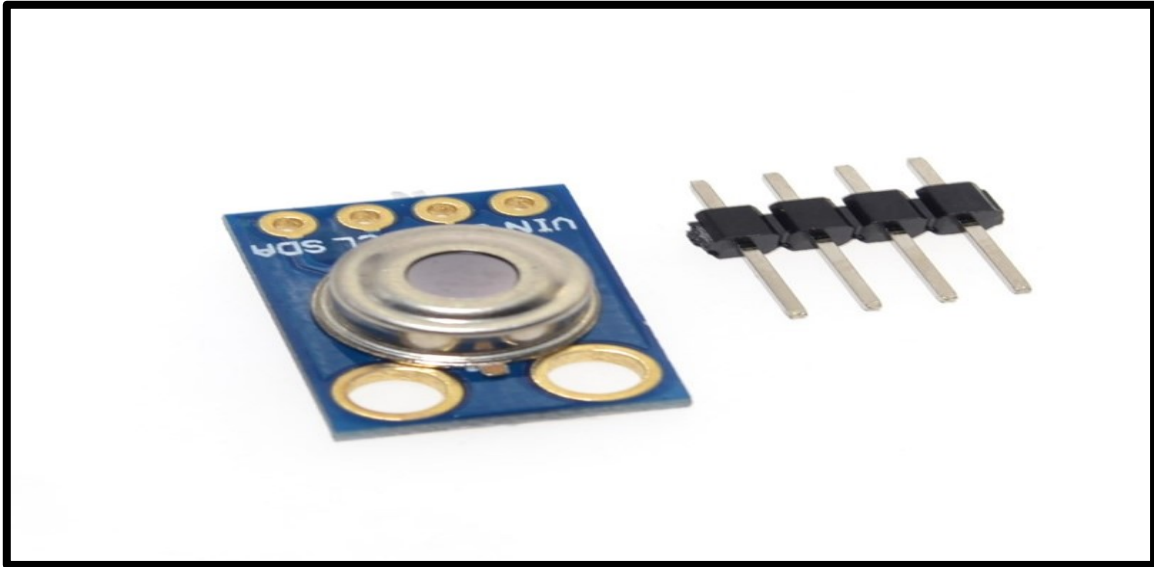


Fig 4-MLX90614 infrared temperature sensor

MLX9 INFRARED TEMPERATURE SENSOR

The MLX90614 is an Infra Red thermometer for noncontact temperature measurements. Both the IR sensitive thermopile detector chip and the signal conditioning ASSP are integrated in the same TO-39 can. its low noise amplifier, 17-bit ADC and powerful DSP unit, a high accuracy and resolution of the thermometer is achieved. The thermometer comes factory calibrated with a digital PWM and SMBus (System Management Bus) output. As a standard, the 10-bit PWM is configured to continuously transmit the measured temperature in range of $-20 \dots 120^{\circ}\text{C}$, with an output resolution of 0.14°C . The factory default POR setting is SMBus.0614 infrared temperature sensor –

c) RC522 –RFID

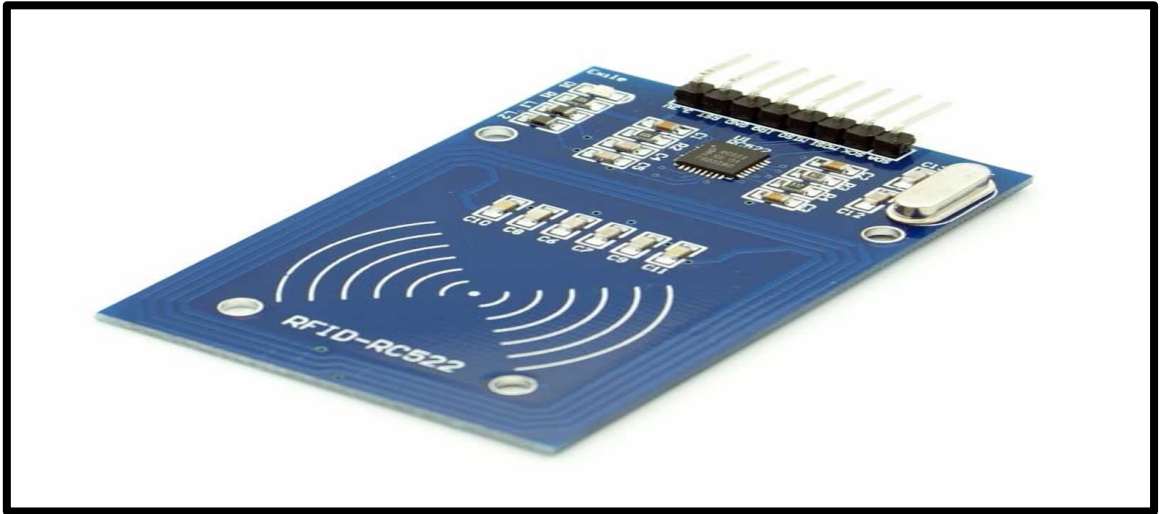


Fig 5- RC522-RFID

The RC522 is a 13.56MHz RFID module that is based on the MFRC522 controller from NXP semiconductors. The module can supports I2C, SPI and UART and normally is shipped with a RFID card and key fob. It is commonly used in attendance systems and other person/object identification applications. The RC522 is a RF Module that consists of a RFID reader, RFID card and a key chain. The module operates 13.56MHz which is industrial (ISM) band and hence can be used without any license problem. The module operates at 3.3V typically and hence commonly used in 3.3V designs. It is normally used in application where certain person/object has to be identified with a unique ID.

d) ULTRASONIC SENSOR LV MAXSONAR
EQUIVALENT MB1040



Fig 6-ULTRASONIC SENSOR LV MAXSONAR
EQUIVALENT MB1040

Features of the MB1040, LV-MaxSonar-EZ4, include one-inch resolution, the narrowest beam width of any sensor in the LV-MaxSonar-EZ sensor line, range information from upto 254 inches, a 20Hz read rate, and various output options: pulse-width, analog voltage, and RS232 serial. The MB1040 is a great choice for applications where only larger objects need to be detected. The MB1040 from the LV-MaxSonar-EZ line of sensors is a very small, less than one cubic inch, ultrasonic sensor component module. This sensor comes with mounting holes provided on the circuit board for easy installation in nearly all applications. In addition, the MB1040 learns the ringdown pattern when commanded to start ranging. This helps the sensor to learn the environment and can help the sensor ignore obstacles that are present at power-up.

e) SERVO MOTOR:

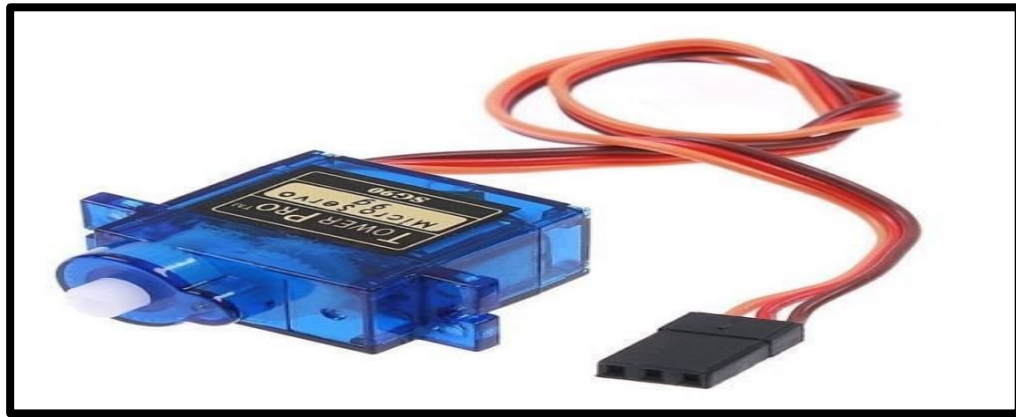


Fig 7-Servo motor SG90 micro

Servo motor SG90 micro

A servo motor is an electrical device which can push or rotate an object with great precision. If you want to rotate an object at some specific angles or distance, then you use servo motor. It is just made up of simple motor which run through servo mechanism. If motor is used is DC powered then it is called DC servo motor, and if it is AC powered motor then it is called AC servo motor. We can get a very high torque servo motor in a small and light weight packages. Due to these features they are being used in many applications like toy car, RC helicopters and planes, Robotics, Machine etc.

f) DC water pump

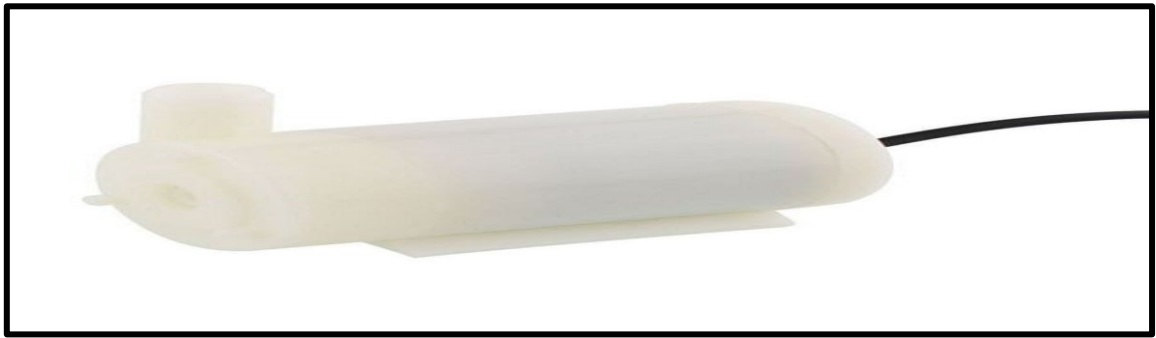


Fig 8-DC water pump

A pump is a device that moves fluids or sometimes slurries, by mechanical action, typically converted from electrical energy into Hydraulic energy. Pumps can be classified into three major groups according to the method they use to move the fluid: direct lift, displacement, and gravity pumps. Pumps operate by some mechanism (typically reciprocating or rotary), and consume energy to perform mechanical work moving the fluid. Pumps operate via many energy sources, including manual operation, electricity, engines, or wind power, and come in many sizes, from microscopic for use in medical applications, to large industrial pumps.

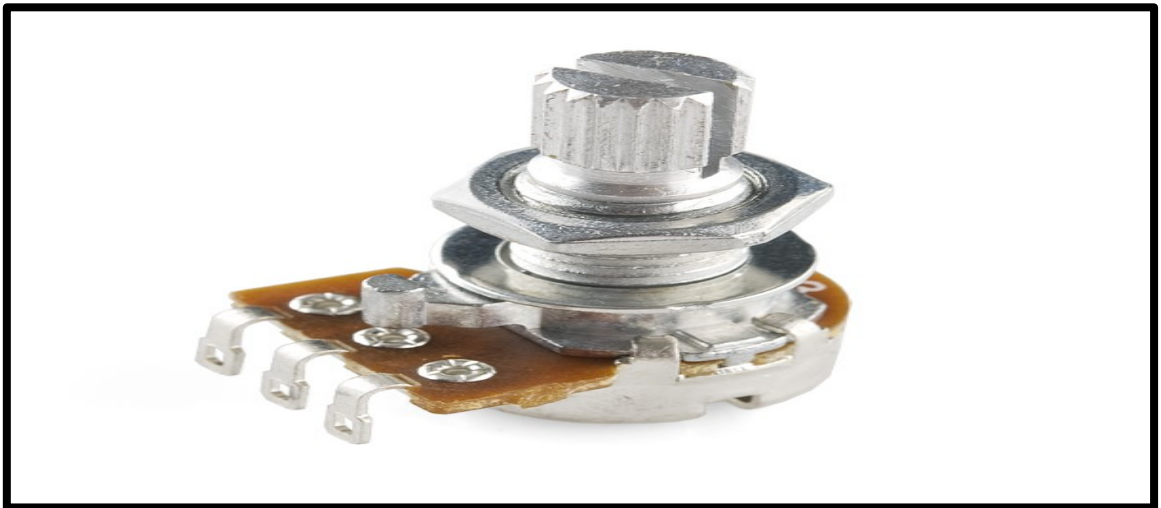
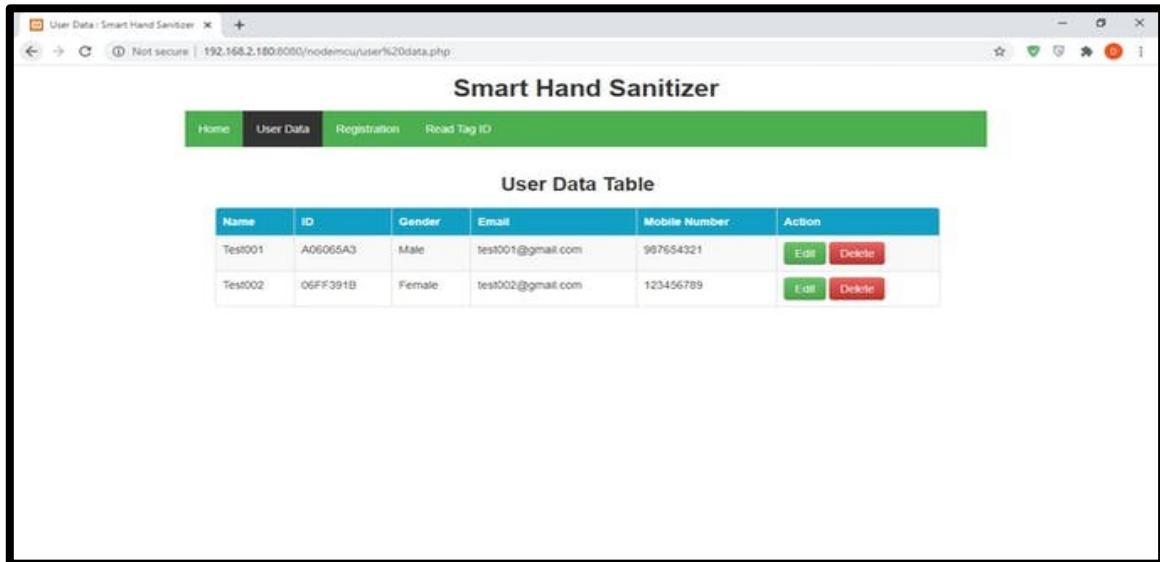
g) Potentiometer

Fig 9-Rotary potentiometer (generic)

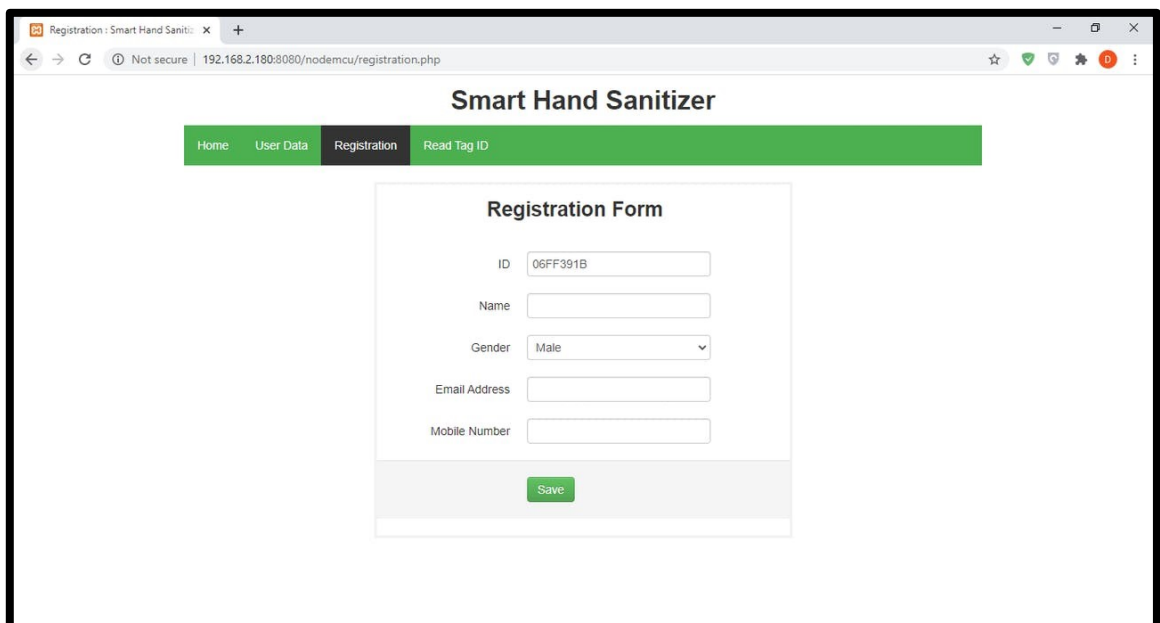
A potentiometer is a three-terminal resistor with a sliding or rotating contact that forms an adjustable voltage divider. If only two terminals are used, one end and the wiper, it acts as a variable resistor or rheostat. The measuring instrument called a potentiometer is essentially a voltage divider used for measuring electric potential (voltage); the component is an implementation of the same principle, hence its name. Potentiometers are commonly used to control electrical devices such as volume controls on audio equipment

- **Software information**

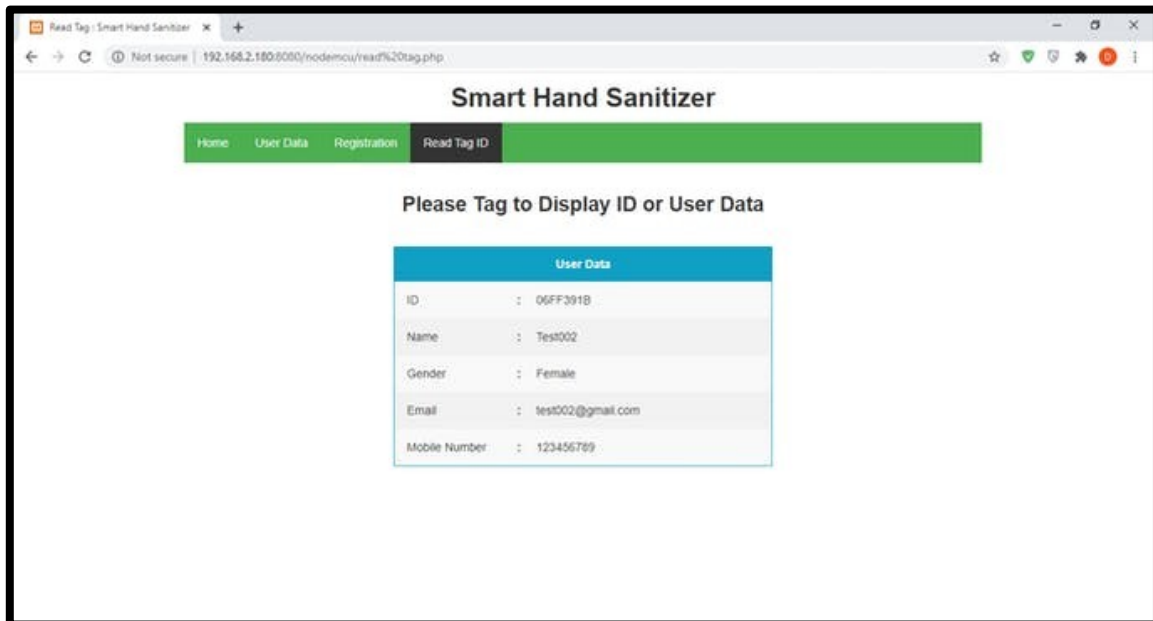
- **User Data Page :**



- **Registration Page :**



- **Read Tag ID :**



- **User Temperature Data :**

The screenshot shows a web browser window with the URL `192.168.0.103/esp32/userdata/ViewLdrValue.php`. The page title is "Smart Hand Sanitizer". The navigation bar includes "Home", "User Data", "Registration", "Read Tag ID", and "User Temp". The main heading is "User Temperature". Below this, a table displays the following data:

| No | ID | Temp Value | Date | Time |
|----|-------------|------------|------------|----------|
| 1 | a4 56 67 | 45 | 2020-07-12 | 16:45:01 |
| 2 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:00:07 |
| 3 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:00:11 |
| 4 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:00:57 |
| 5 | A0 60 65 A3 | 1037.55 | 2020-07-12 | 17:01:00 |
| 6 | A0 60 65 A3 | 1037.55 | 2020-07-12 | 17:01:07 |
| 7 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:01:11 |
| 8 | A0 60 65 A3 | 1037.55 | 2020-07-12 | 17:01:16 |
| 9 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:01:20 |
| 10 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:01:31 |
| 11 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:01:40 |
| 12 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:01:50 |
| 13 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:13:01 |
| 14 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:22:12 |
| 15 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:22:23 |
| 16 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:22:32 |
| 17 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:22:42 |
| 18 | A0 60 65 A3 | 1037.55 | 2020-07-12 | 17:23:03 |
| 19 | 06 FF 39 18 | 1037.55 | 2020-07-12 | 17:23:07 |

3.3 Advantages and Disadvantages

Advantages:

- 1) Automatic.
- 2) Easy to use.
- 3) Delivers a standard dose.
- 4) Eliminates a contact point.
- 5) Modern appearance.

Disadvantages:

- 1) Batteries wear down fast.
- 2) Price factor.
- 3) Maintenance.

3.4 Conclusion

The system surely help in implementing the hand hygiene without any challenges as it is a must to sanitizer if you are to access any entry point. It is much safer and more recommended due to its touch less property which zeros down any chances for cross contamination. This is a user friendly system that anyone can make use of. It can be concluded here that the system has been successfully implemented and the aim is achieved without any deviations. At this time we target Offices, Factories, Companies employees but in the upcoming version we add the functionality for a Visitor of any Shops, hotels, Banks, hospitals etc. so this machine will work for both employee of organization and Visitor also. Also add employee dashboard when the employee also Monitor their data.

3.5 References

1. <https://www.ijert.org/research/a-novel-automatic-sanitizer-dispenser-IJERTCONV81S14033.pdf>
2. <https://www.ijert.org/research/review-on-automatic-sanitizer-dispensing-machine-IJERTV9IS070307.pdf>
3. <https://create.arduino.cc/projecthub/akshavioseph666/covid-190automatic-hand-sanitizer-78cf6b>