



## Design and Construction of Smart Sanitizer Dispenser

*Naveen G<sup>1</sup>, Raghotham C G<sup>2</sup>, MrsYeshwini<sup>3</sup>*

<sup>1,2</sup>UG Students, Department of Electronics and Communication Engineering, K S Institute of Technology, Bangalore, Karnataka, India

<sup>3</sup>Assistant Professor, Department of Electronics and Communication Engineering, K S Institute of Technology, Bangalore, Karnataka, India

### ABSTRACT

In this COVID-19 pandemic period which is a global outbreak, hand hygiene is the core preventive measure in the spread of the disease as advised by WHO (World Health Organization) which includes washing hands with water and soap regularly, hand sanitizing using hand sanitizers, etc. Automatic Hand Dispenser with the help of solenoid valve Detecting body temperature with the help of temperature sensor Sanitizing the objects like watches, jewels, wallets etc by placing inside a UV box with mirror.

**Keywords:** Temperature Sensor , Solenoid Valve, Relay Module, LCD Display.

### 1 INTRODUCTION

As we all know COVID-19 is spreading like a wild fire and all we hear is use a mask, practice social distancing and keep your hands clean. Hand sanitizer is the best way to get rid of all the harmful germs and viruses on our hands but what if a healthy person uses a contaminated dispenser which was previously used by an infected person. Then the same hand sanitizer becomes a cause for spreading the deadly virus.

As we all know COVID-19 is spreading like a wild fire and all we hear is use a mask, practice social distancing and keep your hands clean. Hand sanitizer is the best way to get rid of all the harmful germs and viruses on our hands but what if a healthy person uses a contaminated dispenser which was previously used by an infected person. Then the same hand sanitizer becomes a cause for spreading the deadly virus.

The Covid-19 pandemic, the worst ever witnessed in the last one century, has brought life on crossroads. The need of the hour is to address the safety of our living spaces, personal wellbeing and follow protocols to restart the economy for the continuity of our business operations and stay healthy.

### 2. LITERATURE SURVEY

[1] 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.

[2], 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.

[3] For ages, hand washing with cleanser and water has been viewed as a proportion of individual cleanliness. The idea of purging hands with a germicide specialist most likely rose in the mid nineteenth Century.

[4] In the paper 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

\* Corresponding author.

E-mail address: [K.sakethreddy2019@gmail.com](mailto:K.sakethreddy2019@gmail.com)

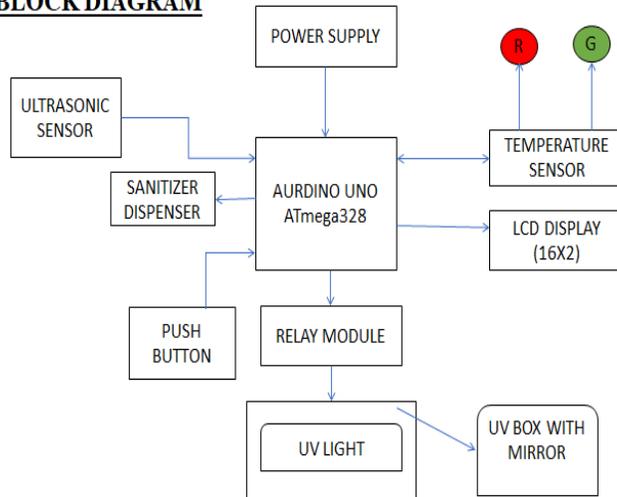
different from that of the bacterial structure, which means that virus has single stranded or double stranded RNA or DNA encapsulated in ‘capsid’ and virus can replicate only in presence of a host and described as ‘living entities’. Bacteria also has almost the same structure including DNA or RNA along with ‘Cell Membrane’ and can replicate without a host [5] The paper also gives a complete comparison between hand sanitizers and soap, foam vsgel, 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

[6] For ages, hand washing with cleanser and water has been viewed as a proportion of individual cleanliness. The idea of purging hands with a germicide specialist most likely rose in the mid nineteenth century

[7] In a paper distributed in 1825, this drug specialist expressed that doctors and different people going to patients with infectious illnesses would profit by soaking their hands with a fluid chloride arrangement.[8] R. MoninaKlevens, et al., used a multi-step approach and three data sources. The main source of data was the National Nosocomial Infections Surveillance (NNIS) system, data from 1990–2002, conducted by the Centres for Disease Control and Prevention.

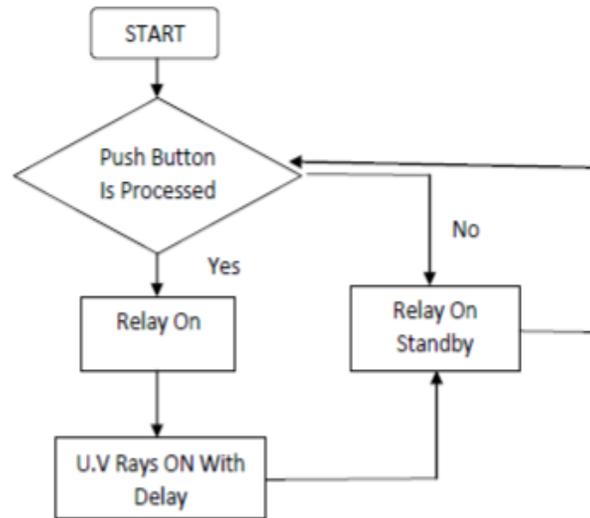
**3. BLOCK DIAGRAM AND COMPONENTS**

**BLOCK DIAGRAM**



Component	Quantity	Value
Arduino Uno	1	
Temperature Sensor	1	
Solenoid Valve	1	
Ultra Sonic sensor	1	
LCD Display(16x2)	1	
Relay Unit	2	5V
Adaptor power supply	1	
Jumper wires	1 set	
Red,GreenLeds	8	
Push Buttons	3	
BreadBoard	1	
UV driver	1	

## 4. METHOD



### 4.1 Input Stage:

It consists of an Arduino Uno microcontroller, an ultrasonic sensor and temperature sensor, LCD display, two resistors, RGB leds and a relay which is connected to a UV driver. The Arduino Uno board is equipped with set of Analog and digital IO pins that maybe interfaced to various expansion boards and other circuits. The board has 14 digital IO pins, 6 Analog IO pins and is programmable with the Arduino IDE, via a type B USB cable. The ultrasonic sensor is used to detects the objects and the temperature sensor used to sense the temperature. We are using two resistors, 1k ohms and 220 ohms. An (16x2) LCD display is used to display the temperature. A relay is introduced which is connected to UV driver.

### 4.2 Operation Stage:

If the object (i.e Hand) is placed the ultrasonic sensor detects the object and temperature sensor senses the temperature. If the distance of the object is less than or equal to 30cm the solenoid valve will turn on if not the valve will be in off state. After the object is detected, the temperature sensor senses the temperature. If the temperature is less than 40 degree Celsius, the RGB led indicates us through green light and if the temperature exceeds 40 degree Celsius, the RGB led indicates us through an red light. This process will be repeating whenever an object is detected.

### 4.3 UV Stage:

The objects like smart phone, wallets, jewels etc are placed inside the UV box, a push switch is introduced after placing the objects the switch is pushed. A delay to a relay the UV light will be emitted inside the UV box. If the Push button in the UV driver is pushed the relay will get turn on with delay which in turns activates the UV driver, if not the relay will be on standby. After the completion of the given delay the relay will return to standby mode. This process will repeat whenever the push button is pushed.

## 5. CONCLUSION

The utmost goal of this project was to use a technology to develop an Automatic hand sanitizing machine to improve hygiene and prevent the infectious viruses entering our body.

Automatic hand sanitizers are priced less when compared to any other hand sanitizing tools or dispensers. A UV tool is used to sanitize the objects like smart phones, wallets, jewels etc.

---

**REFERENCES**

---

- [1] Jessica Hillburn MT(ASCP),CIC, Brian S Hammond, ElanorJFendler PhD, Patricia A Groziak MS, "Use of alcohol hand sanitizer as an infection control strategy in acute care facility", American Journal of infection control Volume 31,Issue 2, April2003.
- [2] Satoru Mitsuboshi, Masami Tsugita, "Impact of alcohol-basedhandsanitizers,antibiotic consumption, and other measures on detection rates of antibiotic resistant bacteria in rural Japanese hospitals", Journal of Infection and Chemotherapy, 2018
- [3] Golin, A. P., Choi, D., &Ghahary, A. "Hand Sanitizers: A Review of Ingredients, Mechanisms of Action, Modes of Delivery, and Efficacy Against Coronaviruses". American Journal of Infection Control ,2020
- [4] John M. Boyce, M.D, Didier Pittet, M.D, Centers for Disease Control and Prevention. Guideline for Hand Hygiene in Health-Care Settings: Recommendations of the Healthcare Infection Control Practices AdvisoryCommittee and the HICPAC/SHEA/APIC/IDSA Hand Hygiene Task Force. MMWR 2002; 51(No.RR-16).
- [5] Klevens RM, Edwards JR, Richards CL, Estimating healthcare-associated infections in U.S. hospitals, 2002. Public Health Rep 2007; 122:160–166.