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# SEWAGE BLOCK DETECTION SYSTEM

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## ABSTRACT

The main objective of this project is to safeguard the front line workers from the dreadful toxic gas emitting from the sewage by alerting them that the toxic gas present in it through SMS alert. Additionally in our project the sewage block is also detected with the help of ultrasonic sensors and report is automatically sent to the corporation office where the sewage block has been occurred through the SMS alert. In the SMS alert message the unique URL is sent stating that where the sewage block has been occurred in the Google Map. By pin pointing the sewage block location in google map we can easily determine the location of sewage blockage and send the rescue team for sewage block removal easily.

## I. INTRODUCTION TO SEWAGE BLOCK DETECTION

Sewage is nothing by the wastes from the industries, residential area and other buildings in the form of grey water. Sewage consists of solid and liquid wastes that travel from one area to another through sewage tunnels. Mostly sewage tunnels are dig underground and buried inside the earth crust and hence the wastes from the buildings are sent through the sewage tunnels through inclined pipelines. Mostly the sewage blocks are occurred due to solid wastes and hence once the blocks occur in sewage, there exists the overflow of sewage through manholes which has to be noted manually and to rescue the sewage blocks one by one. The above mentioned process of finding the sewage blocks manually and rectifying it is a time consuming process and this will spill the sewage all over and hence there exists the high risk of disease spreading due to contamination.

## II. EXISTING SYSTEM

In the existing system, the sewage blocks are determined manually and hence it is the time consuming process and within the block identification and rectification process, the sewage spills all over the man hole areas and hence there exists the high risk of disease spread due to contamination.

## III. PROPOSED SYSTEM

In the proposed system the sewage blocks are determined automatically and the alert message is sent to the corporation office regarding the sewage blockage through SMS. Also in the automatic message the sewage block location is sent through Google map encoded unique URL. By clicking the URL the corporation office front line workers can easily find out the sewage blockage location and reach the exact destination easily through Google map guidance. Additionally, in our project we have also included the facility of determining the toxic gas present in the sewage and report the frontline workers. By this system of approach will save guard the frontline workers valuable life from toxic gas by enabling them to approach the sewage blockage with prevention equipments.

## IV. BLOCK DIAGRAM

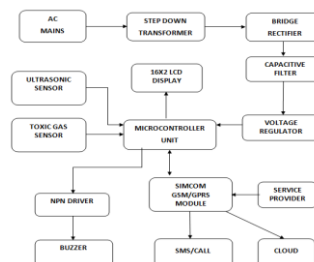


Figure 1: Block Diagram

The above figure represents the systematic block diagram of this project “SEWAGE BLOCK DETECTION SYTEM”. As shown in the block diagram, AC mains are described in order to fetch the power from the AC main source and which is further step down by the step down transformer in order to get the low voltage AC signal from the high voltage Ac signal. Thus obtained AC signal is processed through bridge rectifier in order to extract the DC voltage which is required to operate the microcontroller. Thus the obtained DC source is an unregulated and rippled DC power source, the capacitive filter and voltage regulator like 7805 are used to obtain regulated DC power source for the microcontroller operation.

As shown in the block diagram, the microcontroller unit forms the brain of all the operation and the microcontroller used here is Atmega328 under the Arduino Platform. The Arduino UNO can be programmed with the help of Arduino IDE using Embedded C program. And hence the overall operation of the Arduino Microcontroller unit is programmed and embedded in the microcontroller unit for its operation.

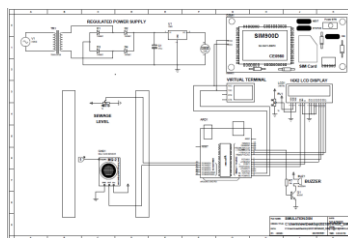
The 16x2 LCD display is used in our project in order to display over all functionality of the project and the status of the project step by step. This kind of LCD displays are the alphanumeric display which is capable of displaying 32 character at the same time. Each row can be able to display 16 characters and it has 2 rows and hence it is named as 16x2 LCD display.

The ultrasonic sensors are used in our project in order to detect the sewage levels in the tunnels. The ultrasonic sensors mainly works based on the ultrasonic sound waves. It has one ultrasonic transmitter and one ultrasonic receiver and hence the ultrasonic transmitter transmits the ultrasonic waves to the sewage level and the ultrasonic wave that gets reflected from the sewage is captured by the ultrasonic receiver section. By calculating the transmitting and receiving time of ultrasonic waves we can easily calculate the sewage distance from the top of the sewage level.

The MQ02 gas sensor module is used in our project in order to sense the presence of toxic gas in the sewage. The MQ02 sensor will return the digital output to the microcontroller unit when there exists the toxic in the sewage.

The SIMCOM GSM modem used in our project to send the triggered SMS alert when the sewage gets filled or when the sewage block occurs. The GSM modem will send the SMS to the predefined number with the help of AT commands from the microcontroller unit through serial pins.

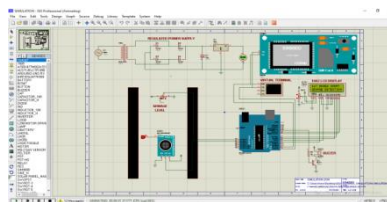
## V. DESIGN METHODOLOGY



**Figure 2:** Circuit Diagram

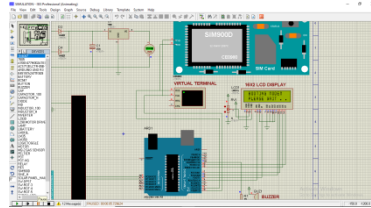
The above design describes the entire circuit diagram of this project “SEWAGE BLOCK DETECTION SYSTEM”

## VI. SIMULATION RESULTS



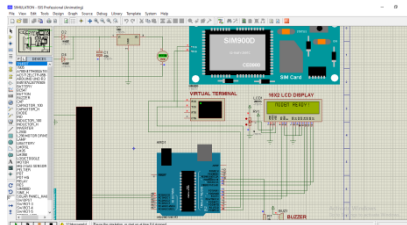
**Figure 3:** Overall Simulation Result

The above figure represents the overall simulation result of our project which is displaying the project name in the 16x2 LCD Display



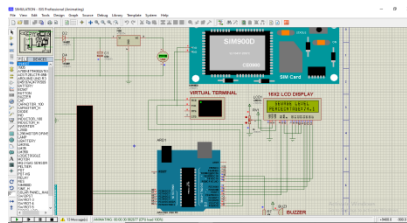
**Figure 4: Booting up Modem**

The above figure represents the booting of SIMCOM GSM modem in order to establish the network connectivity with the service provider inserted in the SIM slot.



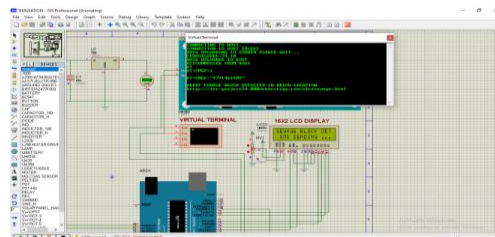
**Figure 5: Modem Ready**

Once the system connected with the network the SIMCOM GSM modem achieves the tower signal from the substation and hence the acknowledgement signal is displayed in the 16X2 LCD display.



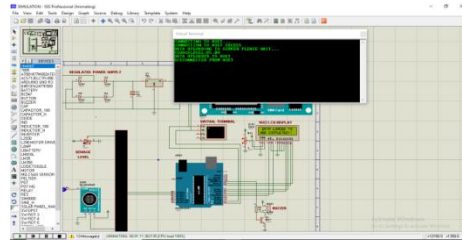
**Figure 6: Sewage Level**

The above figure represents the sewage level in terms of percentage in 16x2 LCD display.



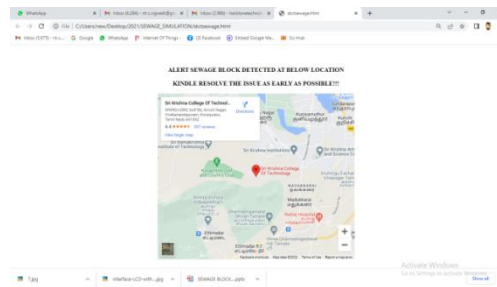
**Figure 8: Sewage Block SMS sending**

In the above figure the SMS sending is displayed in the 16x2 LCD display when there exists the sewage blockage. In the SMS, the URL is sent in order to make the frontline workers to reach the correct destination where the sewage block has been occurred immediately.



**Figure 8:** Data logging to web server

The above figure represents the continuous data logging to webserver regarding the sewage level through TCP/IP protocol..



**Figure 8:** Sewage Blockage displaying in Google map

The above figure represents the sewage blockage in the website through googlemap link. This google map link is sent to the front line workers in order to reach the destination immediately.

## VII. CONCLUSION

Thus by implementing this project we can easily rectify the sewage blockage by identifying the sewage blockage automatically and sending the triggered SMS alert to the desired persons. Additionally the valuable life of front line workers is guarded from toxic gas present in the sewage by alerting them earlier regarding the presence of toxic gas in the sewage block.

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