

# IOT Based Smart Detection System for Harmful Gases in Underground Sewages

Asst. Prof. R.Saravanan, T.Kaaviya, S.Mahalakshmi, D.Kowsalya

Department of Electrical and Electronics Engineering

Vivekanandha College of Technology for Women

Elayampalayam, Tiruchengode -637205

saravaa.007@gmail.com, kaaviyathangavel@gmail.com, dtkrajesh@gmail.com, mahalakshmi11798@gmail.com

**Abstract** – Most of the cities adopted the underground drainage system and it's the duty of Municipal Corporation to maintain cleanliness, healthy and safety of cities. If the drainage system is not properly managed then pure water gets contaminate with drainage water and infectious diseases may get spread. The primary objective of this project is to recognize the dangerous gases present inside sewer-pipeline to offer protected access to sewer-pipeline with the goal that the human fatalities, which happen due to presence of toxic gases can be avoided. This paper addresses NG leakage surveillance through a robust cooperative/synergistic scheme between biosensors and conventional detector systems; the network is validated in situ and optimized in order to provide reliable information at the required granularity level. Therefore we have used the IoT technology to make a Gas Leakage Detector having Smart Alerting techniques involving calling, sending text message and an e-mail to the concerned authority and an ability to predict hazardous situation so that people could be made aware in advance by performing data analytics on sensor readings. This approach is illustrated in the design of leak surveying over a pipeline network in Greece.

## I. INTRODUCTION

The Arduino Uno can be programmed with the (Arduino Software (IDE)). Select "Arduino/Genuino Uno from the Tools > Board menu (according to the microcontroller on your board). For details, see the reference and tutorials. The ATmega328 on the Arduino Uno comes pre-programmed with a boot loader that allows you to upload new code to it without the use of an external hardware programmer.

It communicates using the original STK500 protocol (reference, C header files). You can also bypass the boot loader and program the microcontroller through the ICSP (In - Circuit Serial Programming) header using Arduino ISP or similar; see these instructions for details.

The ATmega16U2 (or 8U2 in the rev1 and rev2 boards) firmware source code is available in the Arduino repository. The ATmega16U2/8U2 is loaded with a DFU boot loader, which can be activated by: On Rev1 boards: connecting the solder jumper on the back of the board (near the map of Italy) and then rising the 8U2. On Rev2 or later boards: there is a resistor that pulling the 8U2/16U2 HWB line to ground, making it easier to put into DFU mode. You can then use Atmel's FLIP software (Windows) or the DFU programmer (Mac OS X and Linux) to load a new firmware. Or you can use the ISP header with an external programmer (overwriting the DFU boot loader).

## II. BLOCK DIAGRAM

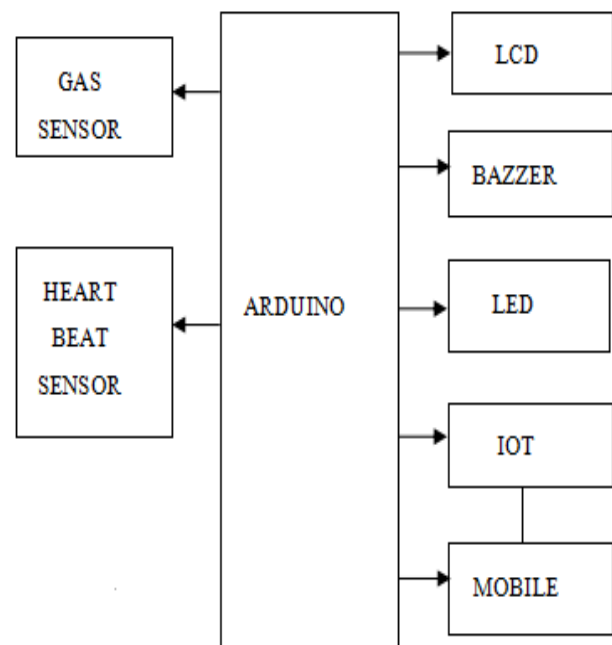


Fig . 1. Smart Detection System.

## III. EXISTING SYSTEM

To control and monitor of different activities focused by Present innovations in technology. To reach the human

needs these are increasingly emerging. Most of this technology is focused on efficient monitoring and controlling different activities. To monitor and assess the conditions in case of exceeding the prescribed level of parameters (e.g., noise, CO and radiation levels) an efficient environmental monitoring system is needed.

#### IV. PROPOSED SYSTEM

Smart Drainage System helps to alert an workers of various gas levels, Obstacle detection by using system application stores sensor performs for reduce the future accidents in drainage channel. Efficient Monitoring, High performance Monitoring system and safe manner. From the fig:1, The main toxic gases present in drainage is carbon monoxide gas, Hydrogen sulphide gas, Methane gas in ppm range, Ultrasonic sensor and Heart Beat sensor in input block and Output block is an alert system such as LED, LCD and Buzzer and interfaced with Arduino controller.

The block diagram of the complete system. The detailed functioning of the systems will be discussed here with the description of all the subsystems. The functioning of every subsystems built with the necessary components will be. This paper based on open drains. so, In future looking forward to closed drains and wireless sensors at cheaper and easier ways to clean then without the help of mankind.

#### V. HARDWARE MODULE

##### 1. Arduino UNO Controller:

The Arduino Uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which six can be used as PWM outputs), six analog inputs, a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

##### 2. Programming :

The Arduino Uno can be programmed with the (Arduino Software (IDE)). Select "Arduino/Genuino Uno from the Tools > Board menu (according to the microcontroller on your board). For details, see the reference and tutorials. The ATmega328 on the Arduino Uno comes pre-programmed with a boot loader that allows you to upload new code to it without the use of an external hardware programmer.

##### 3. Power:

AC-DC adapter (wall - wart) or battery. The adapter can be connected by plugging a 2.1mm center - positive plug into the board's power jack. Leads from a battery can be inserted in the GND and Vin pin headers of the POWER

connector. The board can operate on an external supply from 6 to 20 volts.

##### 4. Flashing an LED:

Light emitting diodes (LED's) are handy for checking out what the Arduino can do.. For this task, you need an LED, a 330 ohm resistor, and some short pieces of 22 or 24 g wire. The figure to the right is a sketch of an LED and its symbol used in electronic schematics.

##### 5. Buzzer:

A buzzer or beeper is a signalling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows.

##### 6. Gas Sensor

Gas sensors are chemical sensors that are of paramount importance. A chemical sensor comprises of a transducer and an active layer for converting the information into another form of electronic signal like frequency change, current change or voltage change. As the air surrounding us contains different amount of gases which could be hazardous to human, atmospheric pollutants or of significance to an industrial or medical process

#### VI. SOFTWARE MODULES

##### 1. Arduino Modules:

IDE stands for Integrated Development Environment. It is a text editor that lets you upload code on to arduino. Every program file is called a sketch and contains all the code that you write for your projects. Every file has an extension of .ino which used to be a .pde!

##### 2. Arduino IDE Syntax Rules:

There are basic syntax rules that you would have to follow while writing code on the arduino IDE.

Let's start with comments. Comments are statements that are written to help the reader understand the code. They aren't statements of code themselves, rather they are used to make the reader understand what the code is all about. There are two different types of comments, single line comments, and multi-line comments.

#### VII. CONCLUSION

The Automatic Air & Sound management system is a step forward to contribute a solution to the biggest threat. The air & sound monitoring system overcomes the problem of the highly-polluted areas which is a major issue. It supports the new technology and effectively supports the healthy life concept. This system has features for the people to monitor the amount of pollution on their mobile phones using the application. So, it becomes very reliable and efficient for the Municipal officials along with the Civilians to monitor environment. Letting civilians also involved in this process adds an extra value to it. As civilians are now equally aware and curious about their environment, this concept of IOT is beneficial

for the welfare of the society. And it is implemented using the latest technology.

### VIII. REFERENCES

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