

# COMBUSTIBLE GAS DETECTION WITH GSM ALERT USING ARDUINO MICROCONTROLLER

<sup>1</sup>P.UDAIKUMAR, <sup>2</sup>Dr.K.PRAHLADA RAO

<sup>1</sup>PG Research Scholar, <sup>2</sup> Professor of Mechanical Engineering

<sup>1</sup>Advanced IC Engines (ADICE), Mechanical Engineering

JNTUA College of Engineering (autonomous), Ananthapuramu, Andhra Pradesh, India.

## Abstract:

Health Safety is a major issue in current era and good safety systems are needed to be implemented in places related to work, education and living. Vehicles are the main source of transportation. The vehicles deliver harmful gases because of fragmented burning of fuel. These Toxic gases are exceptionally destructive for people. In this day and age wellbeing and security assumes a crucial part so there ought to be great security and security. This paper outlines an inserted framework for a vehicle, which detects the gases like carbon monoxide (CO). Screens them and show their substance at every single second. On the off chance that the level of the CO builds, cautioning message SMS is sent to the approved client by means of GSM alongside the area of the vehicle utilizing GPS beneficiary. The vehicle naturally stops if the CO levels surpass predefined esteem. The benefit of this robotized discovery and alarming framework over the manual strategy is that it offers brisk reaction time and exact recognition of a crisis and in this manner driving quicker dispersion of the basic circumstance.

*Keywords: Arduino UNO R3, LCD, Buzzer, DC Motor, Relay, GSM, GPS Receiver, Gas sensor*

## 1.INTRODUCTION

Though there's increase within the development of technology and humankind however we've got been didn't lookout regarding the environment during which we tend to board. Thus, we tend to contaminated the atmosphere and thereby reducing the standard of the air within the place we tend to live into. One such example is automobiles. automobiles square measure the most supply of transportation and additionally the most supply of pollution. some twenty fifth of the venturesome gases that square measure free into air because of automobiles. out of doors atmosphere pollution levels square measure the key concern, however the standard of air within the vehicle plays a significant half. carbon monoxide gas (CO) is odourless, colorless, and tasteless, however additionally extremely nephrotoxic on nature. the surplus content of CO in air is toxic for human. the foremost common symptoms of carbon monoxide gas CO poisoning could gibe alternative styles of poisonings and infections, together with symptoms like headache, nausea, vomiting, dizziness, fatigue, and a sense of weakness. And also, a number of the result includes visual disturbance, confusion, disorientation, syncope and seizures. So, it will cause minor health results like irritation of eyes to major effect just like the higher system to chronic disease, carcinoma, cardiopathy, and even death. take into account one scenario wherever the content of CO in vehicle is on top of the traditional level and it's inflicting minor result like Eye irritation to driver. because of that he could lose his concentration on the road, which can result to serious accidents. thence to avoid these styles of issues there's a necessity to require precautions. And this includes the detection of many nephrotoxic gases like carbon monoxide gas (CO). The embedded system is employed within a vehicle so the presence or leak of nephrotoxic gases may be detected by the gas sensors and correct precautions may be taken.

## II. LITERATURE SURVEY

[1]**Anita Kulkarni, and Ravi teja**, In 2014 built up the "Computerized System for contamination Detection and administration in Vehicle". The point of the venture is to watch and administration the contaminations inside the vehicle by abuse the contamination input circuit. This contamination input circuit comprises of arranged gadgets like smoke sensor, temperature gadget and GSM, GPS sensibly gadgets, and each one of them square measure incorporated and associated with a Controller. it's a genuine time work wherever a demo application has been made amid which ARM seven processor is utilized and a controller load up is shaped wherever of these gadgets get incorporated and work thus. The vehicle is controlled by this circuit. once a vehicle achieves beyond any doubt edge contamination level then the motor gets mechanically changed partner degreed a SMS is created and sent to the pre-characterized assortment hang on inside the memory through the GSM module. The GPS module is utilized to discover the vehicle position wherever it's ended. This paper shows a proficient usage of innovation by that we tend to spare the earth by prevailing the contamination of vehicles.

[2] **Vasana prathyusha, P. Bala murali Krishna**, In 2015 built up the "Contamination enroll vehicle and Alerting System abuse Location Identifier". This paper presents machine-controlled framework for contamination identification in vehicles. since the use of vehicles is a ton of in as of late, contamination is expanding radically. As to the over downside we tend to plan to make an implanted framework for prevailing the contamination in vehicles. This emanation from vehicles cannot be totally kept away from anyway it decidedly be controlled by abuse semiconductor sensors for sleuthing the varying gases. this technique "Contamination enlist vehicles and cautioning framework" utilizes GPS and GSM Technologies. once the contamination/outflow level shoots on the far side the officially set power, there'll be a buzz inside the vehicle to point that the utmost has been broken and this information will be send to the enrolled portable assortment abuse GSM. all through this point sum, the GPS begins finding the vehicle and GPRS demonstrate the qualities on the website page. The synchronization and execution of the total technique is checked and controlled by a microcontroller.

[3]**Sandip S. Patil, Jaykaran Singh**, in 2015 built up the "Checking and overwhelming of bold Gases inside Vehicle and Alerting abuse GSM Techonlogy for the security of people inside the Vehicle". In these days, voyager vehicle square measure the most supply of transportation. These vehicles turn out nephrotoxic gases as a result of inadequate burning of fuel. These nephrotoxic gases square measure unpleasantly destructive for people. This paper styles on installed framework for a vehicle, that detects the gases like CO. Screens them and demonstrate their substance at each and each second. On the off chance that the measure of the CO will increment than the conventional at that point relate degree caution is created mechanically and moreover ventilation is given at this point. A notice rub SMS is sent to the endorsed client by means of GSM. the advantages of this machine-controlled recognition relate degreed cautioning framework over the customary approach is that gives quick inert period and right location of a crisis thus driving snappier dissemination of the vital situation.

[4]**D.D.Mondal, Rutuja Deshpande, Pooja bhagat, Gitaniali Bandal** , In 2017 built up the "A framework sleuthing partner degree contamination and following abuse GPS and GSM". This emanation from vehicle can not be completely turn away be that as it may, it decidedly might be controlled. As a response to the over disadvantage we tend to intend to make a programmed framework for emanation level recognition in vehicles and showed this level with a meter. once the contamination level shoots on the far side the edge level, there'll be a bell inside the vehicle to point that he constrain has been broken and this information has been send control space that grasp vehicle assortment, proprietor subtle elements and position of the vehicle by abuse GPS. In future we can include facilitate choices like activity police have relate degree specialist to keep the vehicle remotely by causation a SMS abuse GSM. This paper, once cushion as a genuine time venture can quality the general public and encourage in lessening the contamination.

### III. . IMPLEMENTATION

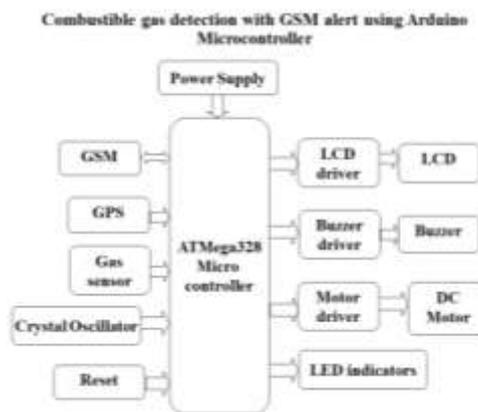


Fig 1: **Block diagram of construction of combustibility gas detection with GSM alerts**

Microcontroller forms the dominant module and it's the center of the device. Gas sensor, GPS, GSM, Buzzer, LCD, DC Motor square measure interfaced to the microcontroller. The gas values square measure displayed on the alphanumeric display, system provides associate degree perceptible alert mistreatment Buzzer, the motor mechanically stops once gas levels exceed the predefined price. The controller performs the practicality of receiving information from the GPS alongside device connected to that and send the SMS alert through GSM to the user. The Microcontroller is loaded with a program written in embedded 'C' language to perform the task.

### IV. RELATED WORK

The brief introduction of different modules used in this project is discussed below:

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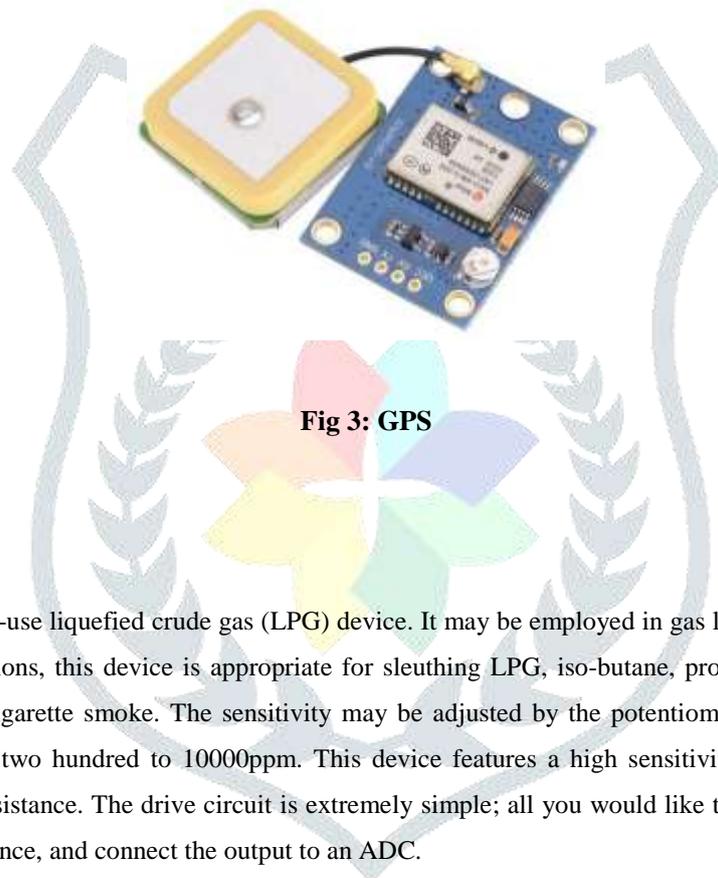
#### ARDUINO UNO R3:

The **Arduino Uno R3** is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 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 a AC-to-DC adapter or battery to get started.



**Fig 2: Arduino uno R3:****GPS:**

A GPS receiver calculates its position by exactly temporal arrangement the signals sent by the GPS satellites high on top of the planet. The receiver utilizes the messages it receives to see the transit time of every message and computes the distances to every satellite. These distances along side the satellites' locations square measure used with the attainable aid of trilateration to figure the position of the receiver. This position is then displayed, maybe with a moving map show or latitude and longitude; elevation data could also be enclosed. several GPS units additionally show derived data like direction and speed, calculated from position changes.

**Fig 3: GPS****GAS SENSOR:**

The MQ6 could be a simple-to-use liquefied crude gas (LPG) device. It may be employed in gas leak sleuthing instrumentation in shopper and business applications, this device is appropriate for sleuthing LPG, iso-butane, propane, LNG. Avoid the noise of alcohol, cookery fumes and cigarette smoke. The sensitivity may be adjusted by the potentiometer. The MQ-6 will notice gas concentrations anyplace from two hundred to 10000ppm. This device features a high sensitivity and quick latent period. The sensor's output is an analog resistance. The drive circuit is extremely simple; all you would like to try and do is power the heater coil with 5V, add a load resistance, and connect the output to an ADC.

**Fig 4:MQ6 sensor**

**LCD:**

One of the most common devices attached to a micro controller is an LCD display. Some of the most common LCD's connected to the many microcontrollers are 16x2 and 20x2 displays. This means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.

**Fig 5: LCD**

The LCD requires 3 control lines as well as either 4 or 8 I/O lines for the data bus. The user may select whether the LCD is to operate with a 4-bit data bus or an 8-bit data bus. If a 4-bit data bus is used the LCD will require a total of 7 data lines (3 control lines plus the 4 lines for the data bus). If an 8-bit data bus is used the LCD will require a total of 11 data lines (3 control lines plus the 8 lines for the data bus).

**DC MOTOR:**

A DC motor uses electrical energy to turn out energy, typically usually through the interaction of magnetic fields and current-carrying conductors.

The DC motor has 2 basic half's: the rotating half that's referred to as the armature and the stationary part that features coils of wire referred to as the field coils. The stationary half is additionally referred to as the stator. this carrying conductor is placed in an exceedingly field sheer, so the conductor experiences a force within the direction reciprocally perpendicular to each the direction of field and also the current carrying conductor. Fleming's left-hand rule says that if we tend to extend the finger, finger and thumb of our mitt perpendicular to every alternative, in such some way that the center finger is on the direction of current within the conductor, and finger is on the direction of field i.e. north to South Pole, then thumb indicates the direction of created mechanical force.

**Fig 6: DC Motor**

**RELAY:**

A relay is associate degree electrically operated switch. several relays use associate degree magnet to work a switch mechanism, however alternative operative principles are used. Relays realize applications wherever it's necessary to manage a circuit by a low-power signal, or wherever many circuits should be controlled by one signal. a kind of relay that may handle the high power needed to directly drive an electrical motor is termed a contactor. Relays with label operative characteristics and typically multiple operative coils square measure wont to shield electrical circuits from overload or faults; in fashionable wattage systems these functions square measure performed by digital instruments still referred to as "protection relays".

**Fig 7: Relay****BUZZER:**

A buzzer is a mechanical, electromechanical, magnetic, electromagnetic, electro-acoustic or piezoelectric audio signaling device. We are using electromagnetic buzzer in our project. The vibrating disk in a magnetic buzzer is attracted to the pole by the magnetic field. When an oscillating signal is moved through the coil, it produces a fluctuating magnetic field which vibrates the disk at a frequency equal to that of the drive signal.

**Fig 8: Buzzer****GSM MODULE:**

GSM is a cellular network, which means that cell phones connect to it by searching for cells in the immediate vicinity. This is a GSM/GPRS-compatible Quad-band cell phone, which works on a frequency of 850/900/1800/1900MHz and which can be used not only to access the Internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMS.



**Fig 9: GSM Module**

## V. WORKING OF THE PROJECT:

Power offer during this system is from the electric power by mistreatment associate degree adoptive parent. These power in terms of AC this will be regulated to the DC power by mistreatment devices like electrical device, rectifier, filer and regulator. When this await the few times for optimization and additionally sleuthing the latitude and line of longitude purpose of a system. Take the flammable gas as an example CO or HC gas almost about the gas device. During this project i exploit the lighter as a supply of flammable gas. During this gas device component is gift it'll optimize thereupon heat of our flammable gas. If a lot of flammable exist buzzer can provide the sound at constant we tend to get alerts through GSM and it'll additionally provide location of the vehicle by GPS. This project additionally works with constraint if flammable gas is a lot of it'll stop the DC motor.

## VI. CONCLUSION:

The existing model presents an Integrating feature of all the hardware components which has been used and developed in it with ATmega328p Microcontroller. The Presence of each and every module has been reasoned out and placed very carefully. Hence the contributing to the best working unit for “COMBUSTIBLE GAS DETECTION WITH GSM ALERT USING ARDUINO MICROCONTROLLER” has been designed perfectly. Thus, the project has been successfully designed and tested.

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