An Automated System to Detect and Control Drunken Driving and Vehicle Pollution

M.Archana[1], M.Haritha[2], T.Sathiya[3] and S.Angayarkanni[4]

[1]UG Scholar, Department of Electronics and Communication Engineering, SVS College of Engineering, Coimbatore, India.
[2]UG Scholar, Department of Electronics and Communication Engineering, SVS College of Engineering, Coimbatore, India.
[3]UG Scholar, Department of Electronics and Communication Engineering, SVS College of Engineering, Coimbatore, India.
[4]Assistant Professor, Department of Electronics and Communication Engineering, SVS College of Engineering, Coimbatore, India.

ABSTRACT

Now a days, due to overpopulation the usage of vehicles are constantly raising which leads to drastic increase in pollution level. Accidents are also increasing these days due to drunken drive. People prefer the AC vehicle and these vehicles run using petrol, diesel, CNG. The rate of fuel consumption by these vehicles are high and the life rate is low, they release large amount of heat to the atmosphere. The pollution level is high in traffic area as the engine is ON for long time on standing mode.   All these reason the emit toxic gas inside the vehicle which is injurious to the human health. This project includes alcohol sensor to avoid accidents due to drunken drive. Alarm sound will alert driver using buzzer. If he is drunken, and the engine will not get ignite. The other aim of this project is will also control pollution levels using CO sensor.GPRS will give the information to the RTO office and then the message will be displayed on the smart phone of vehicle user through the android application which maintains the information about the alcohol consumption, pollution level and the service details for each vehicle number. Thus tracking of the vehicle is possible when the vehicle is in dangerous situation. The values of the alcohol sensor and CO sensor are displayed on LED. The heart of this project is ATMEGA162 microcontroller and by using this project pollution level and accidents due alcohol consumption are highly reduced.

1. INTRODUCTION

- Vehicle which uses combustion engines may contribute to large amount of pollution to the environment.

- This may be due to the fuel as well as due to improper maintenance of vehicle.

- The heart of the project to control air pollution is ATMEGA16 microcontroller.

- When the pollution level increases beyond given threshold level, microcontroller automatically indicates the driver by different ways.

- All information about the pollution level and the alcoholic based data will be automatically sent to the RTO office.

- Even for the alcoholic sensing, certain indications are provided to stop the driving.

- The synchronization and the execution of the entire process is monitored and controlled by a microcontroller.

2. LITERATURE REVIEW

AUTHOR NAME &YEAR	TITLE	CONTENT	ADVANTAGES	DISADVANTAGES
2006	Bharat stage emission standards	➢ Using the Bharat stage emission standards the critical levels of emission has been evolved. ➢ Separate an emission levels for diesel and petrol vehicles has been mentioned in the Bharat stage emission standards.		
2008 George F. Fine, Leon M. Cavanagh, Ayo Afonja and Russell Binions	Intelligent residential security alarm and remote control system based on single chip computer.	➢ To monitor the engine heat and pollution level. ➢ 500ppm alarm. ➢ Indicators ▪ LCD ▪ Alarm ▪ LED ➢ The micro controller used here is LPC2148. ➢ The time limit is 2hrs.		➢ Ppm level is less. ➢ There is no message notification to the drivers. ➢ Time is limited by 2hr. ➢ Location of nearest service station is not available

2010 K. Galatsis, W. Wlodarsla, K. Kalantar-Zadeh and A. Trinchi	Metal oxide semi-conductor gas sensors in environmen-tal monitoring & Investigation of gas sensors for vehicle cabin air quality monitoring	➤ The gases CO, NO2, Nox, NH3 and CO2 are sensed by MQ7 sensor. ➤ Based on the band theory the metal sensor has been classified into 2 types 1. N-type metal sensor has high resistance for oxidation and for reducing gas the resistance gets decreased. 2. P-type metal sensor has low resistance for oxidation and for reduction vice versa. ➤ The gas sensitivity of the surface and particle boundary are the same. CO SENSOR ➤ CO is colourless gas with no odour, making it undetectable to humans. ➤ Highly poisonous gas which when exposed in high level will lead to death. ➤ Safety level of exposure which is predefined in controller is 35ppm over 8 h periods. ➤ When the exposure is greater than 12800ppm it leads to death in 3mins. CO2 SENSOR	➤ Low cost compared to other sensing technology ➤ Robust & reliable. ➤ Light weight ➤ Long lasting ➤ Quick response time ➤ Large surface area.	

		. ➢ Even though CO_2 is useful in various applications, it is also a greenhouse gas. ➢ Increased concentration of CO_2 in atmosphere increases the temperature. ➢ Gas sensor can measure the Output of CO_2 during combustion of fuels such as coal, methane, petrol and kerosene with appropriate amount of oxygen yields CO_2 and water. ➢ In earth CO_2 level is of 388ppm. NH3 SENSOR ➢ NH_3 is caustic and hazardous colourless gas with pungent odour. ➢ High concentration of NH_3 leads to killing of animals and undesirable to humans. ➢ The predefined NH_3 level is 30ppm and NO level is40ppm. ➢ Beyond this level it is consider to be undesirable.		

2015 Martin McMahon & CDX Global;	Pollution check in vehicle and alerting system using locator identifier	➢ For the detection of the air pollution in vehicle ➢ To solve problem in this project they aim to build an embedded system for controlling the pollution in vehicle ➢ Controlled by using the semiconductor sensors for detecting the various gases ➢ Microcontroller used is LPC2148 ➢ Uses GPS and GSM technologies ➢ Buzzer in vehicle to indicate the limit and this information will be send to the mobile number using GSM ➢ GPRS starts locating the vehicle and GPS display the value	➢	

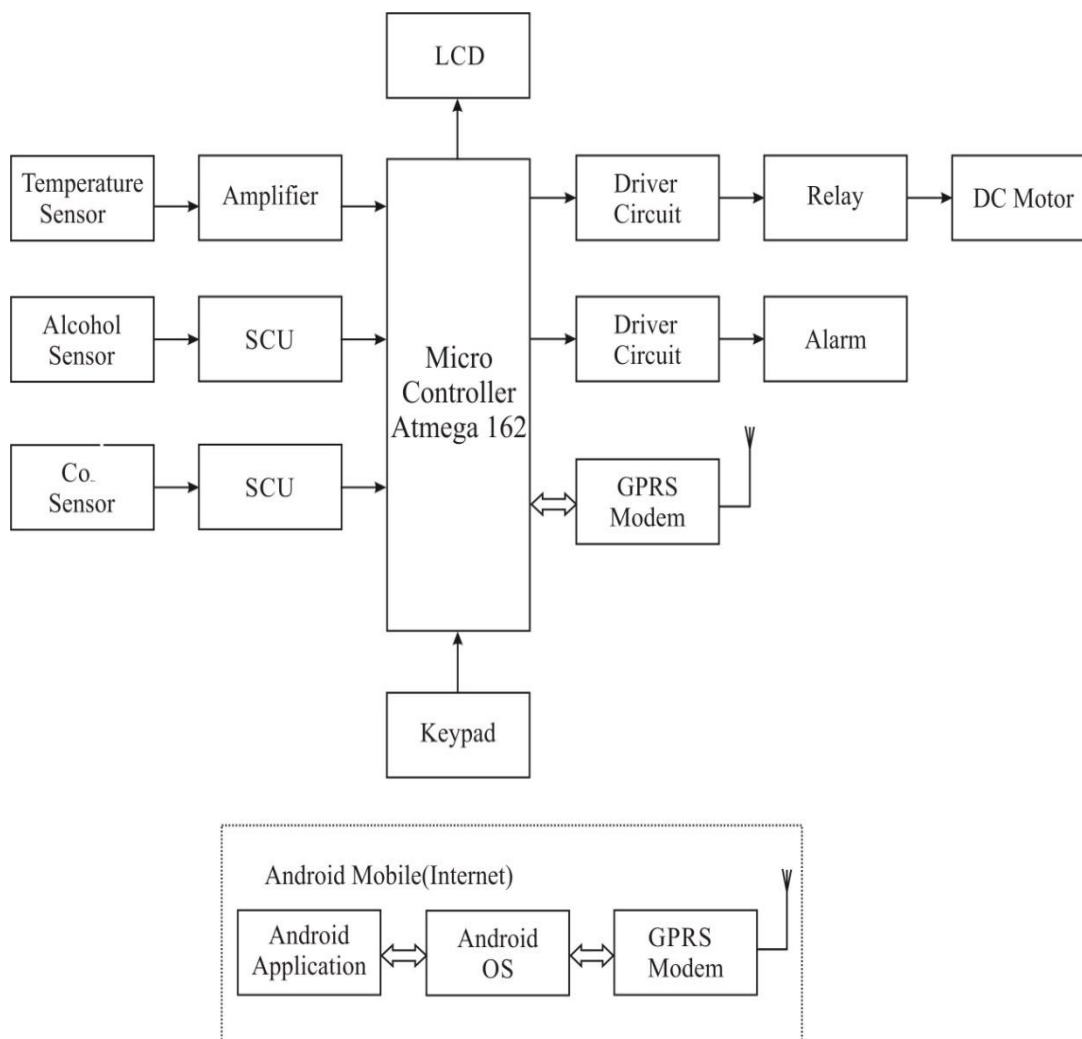| 2017	Automated control system for air pollution detection and alcohol detection in vehicles	➢ CO measurement range is from 70ppm to 1000ppm. ➢ Temperature ranges between -55 to-150 degree celsius. ➢ Pollutant level is predefined in vehicles. ➢ Microcontroller used here is ATMEGA162. ➢ Monitoring the pollution level until reaching the threshold value predefined for each pollution causing gases and when the level raises beyond the threshold value then various level of indication are given to the users. ➢ Android application is developed to maintain the details regarding pollution levels, alcohol consumption and number of times the vehicle has been serviced to the users. ➢ The application is interlinked to the vehicle number. ➢ When the alcohol consumption level is beyond 400BAC (blood alcohol content) is sensed by the breath analyser, The vehicle	➢ GPRS ➢ Intimation will be provided to the RTO office. Different levels of indications are given. ➢ Alcohol detection is possible. ➢ Over heat of engine is also sensed. ➢ There is no time limit. ➢ On viewing the application it is able to pay tax by the users. ➢ Database in the RTO office can be maintained easily.	

		will not start through the GPRS the message will be send to the user who possess that specific application. ➢ All the details regarding pollution level, time to service, temperature notification and alcoholic ranges will be displayed. ➢ Database will be maintained regarding the every vehicle user in the RTO office.		

EMISSION STANDARDS FOR LIGHT DUTY DIESEL Engines/kwh

YEAR	CO	HC	HC+NOX
1991	12.3	8.12	-
1996	5.5	-	3.60
2000	2.0	-	2.0
2005	1.5	-	1.4
2010+	1.0	-	1.0

EMISSION STANDARD FOR TWO-WHEEL PETROL Vehicles/kw

YEAR	CO	HC	NOX	PM
1992	14.0	3.5	18.0	-
1996	11.20	2.40	14.4	-
2000	4.50	1.1	8.0	0.36
2005+	4.0	1.1	7.0	0.15

3. BLOCK DAIAGRAM

4. CONCLUSION

The existing "Automated control system for air pollution detection in vehicles" is an Integrating feature of all the hardware components been used and developed in it. The Presence of each and every module has been reasoned out and placed very carefully. Hence the contributing to the best working unit for a tracking of vehicle and for pollution control along with security system has been designed perfectly. Secondly, using highly advanced IC's like GPS module, GPRS technology with the help of growing technology, the project has been successfully implemented with a unique idea. Thus the project has been successfully designed and tested. This system also enables to monitor the accident situations and it can immediately alert the police/ ambulance service with the location of accident. This project can be extended using high efficiency GPS receiver and a GSM module. The GPRS module gives the intimation of the person with this system through SMS services to the pre-defined authority's phone numbers.

REFERENCES

[1] http://wikipedia.org/wiki/Bharat_Stage_emission_standards.

[2] George F. Fine, Leon M. Cavanagh, Ayo Afonja and Russell Bunions' "Metal Oxide Semi-Conductor Gas Sensors in Environmental Monitoring", Sensors 2008, 10, 5469-5502; Doi: 10.3390/s100605469.

[3] K. Galatsis, W. Wlodarsla, K. Kalantar-Zadeh and A. Trinchi, "Investigation of gas sensors for vehicle cabin air quality monitoring," vol. 42, pp. 167-175, 2010.

[4] "Trade of Motor Mechanic"; Module 5; Unit 2 Electronic Fuel injection; Phase 2 by FÁS Learning Innovation Unit with Martin McMahon & CDX Global; Curriculum Revision 2.2 16-01-2014.

[5] LIU Zhen-ya, WANG Zhen-dong, CHEN Rong, "Intelligent Residential Security Alarm and Remote Control System Based on Single Chip Computer," vol. 42, pp. 143-166, 2015.