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Intelligent monitoring system for automobiles

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Abstract:

: The importance to develop this project is vehicle accident prevention by using alcohol detector under the influence alcohol, vehicle security system to prevent theft and a fire sensor is designed to detect and respond in presence of flame. This system is developed by interfacing these sensors with microcontroller. MQ-3 sensor is an alcohol sensor used to detect content of alcohol in human breath. Based on the level of Blood Alcohol Content (BAC) this system will work. MQ-2 sensor is a fire sensor used to detect the heat produced in car engine and a metal detector is used to prevent theft. This total system is installed inside the vehicle.

Key words: MQ-3, MQ-2, 8051 microcontroller

1. INTRODUCTION:

With India reporting as many as 1.34 lakhs fatalities in road accidents every year, a vast 70 percent of them is being due to drunken driving and each day, nearly 3,500 people die on the roads worldwide. Fires are the accidents which occur most frequently, whose causes are the most diverse and which require intervention methods and techniques adapted to the conditions and needs of each incident. 3.16 lakh fire accident cases were reported in the country; more than 20000 cases were reported in 12 of the 14 years. Close to 3 lakh people lost their lives in fire accidents between 2001 and 2014, an average of 59 deaths per day. To provide security for passengers and driver is very important concern. Now-a-days lakhs of deaths and lakhs of injuries were occurred due to road accidents. The main reasons for this are over speed, drunken driving and overheating of engine. Normally breath analyzers are used to analyze the alcohol content on breath. This process may take long time and a costlier.

Fire extinguishers are used to reduce the effect of flame. It is used for small fires and not used in case of large fires and also cannot provide any alarm indication. To find out the location of car is difficult on theft. It may take long time to detect the vehicle. So this is the system which can provide the automatic safety to driver and passengers. MQ-3 sensor can detect the alcohol content automatically presented in surrounding air and automatically stops the car. MQ-2 sensor can detect the fire occurrence in the vehicle and can provide an alarm sound for alert and stops the car automatically. The GPS and GSM modem is used to detect the location of the vehicle. GPS system can works based on the information given by the satellites. This information is sent to victims in the form of message by using GSM modem.

2. HARDWARE COMPONENTS:

2.1. MICROCONTROLLER:

Microcontroller is a computer on a single integrated circuit. A microcontroller contains one or more CPUs (processor cores) along with memory and programmable input/output peripherals. These are used in automatically controlled pr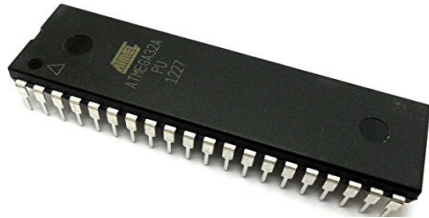oducts and devices such as automobile engine control systems, remote controls, power tools and other embedded systems. Microcontrollers are "embedded" inside some other device so that they can control the features or actions of the products.

Fig.1: microcontroller

2.2. MQ-3 SENSOR:

This alcohol sensor detects the concentration of alcohol gas in air and read outputs as an analog voltage. The concentration sensing range is from 0.04 mg/L to 4 mg/L is suitable for breath analyzers. It can provide more sensitivity to alcohol gas and less conductivity to the interference of gasoline, smoke and vapour.

Fig.2: Alcohol sensor

2.3 MQ-2 SENSOR:

SnO_2 is sensitive material of MQ-2 sensor, this can provide conductivity when combustible gas exist and lower conduction in clean air. The fire sensor has built in potentiometers that adjust the sensor sensitivity according to how accurate want to detect gas. The concentration sensing range is from 300ppm to 10000ppm. The MQ-2 gas sensor is sensitive to LPG, I-butane, propane, methane, alcohol, Hydrogen and smoke.

Fig.3: fire sensor

2.4 L293D IC:

It is a dual H-bridge motor controlled integrated circuit. It works as a current amplifier because it takes low current signal and gives high current signal to the motor which can drive the motor. This circuit is used in robotics and the application where they allow of DC motors to run in forward and backward directions. The L293D is a quadruple half H-bridge bidirectional motor driver IC that can drive current of up to 600mA with voltage range of 4.5 to 36 volts.
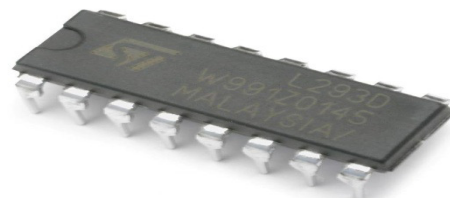

Fig.4: L293D IC

2.5 BUZZER:

A buzzer is an audio signaling device which may be electromechanical. A relay may be connected to interrupt its own actuating current, causing the contacts to

buzz. The buzzer can acts as both alarm and musical tone oscillator. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Fig.5: Buzzer

2.6 GSM MODEM:

GSM stands for global system for mobile communication used for transmitting mobile voice and data services. This requires a SIM card to be operated and operates over a network range subscribed by the network operator. This allows the computer to use the GSM modem to communicate over the mobile network. GSM modem exposes an interface that allows applications such as SMS to send and receive messages over the modem interface.
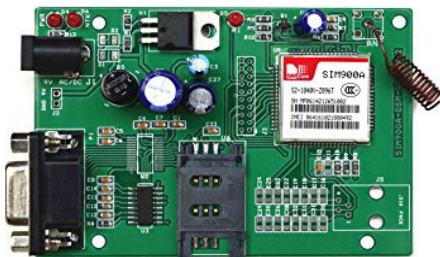

Fig.6: GSM modem

2.7 GPS:

GPS is a network of orbiting satellites that send precise details of their position in space back to earth. The signals are obtained by GPS receivers, such as navigation devices and are used to calculate the exact position, speed and time at the vehicles location. GPS operates independently of any telephonic or internet

reception, though these technologies can enhance the usefulness of the positioning information. GPS satellites continuously transmit data about their current and position. The precise position of the receiver and its deviation from true time.
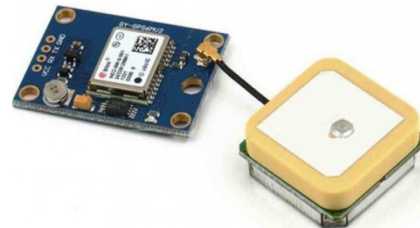

Fig.7: GPS system
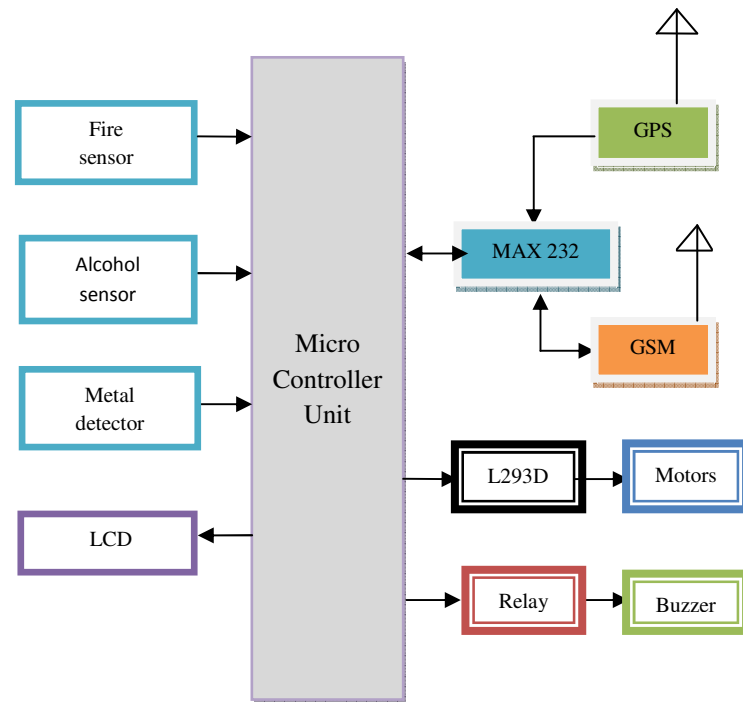
BLOCK DIAGRAM OF THE SYSTEM:

Fig.8: Block diagram

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3. SOFTWARE SPECIFICATIONS:

3.1. KEIL SOFTWARE:

Keil development tools offer a complete development environment for ARM, microcontroller, Cortex-M and cortex-R processor based devices. They are easy to learn and use, yet powerful enough for the most demanding Embedded applications.

3.2. EXPRESS PCB:

Express PCB is easy to lean and fast to use. It is an all in one freeware in which schematic as well as PCB layout can be made.

3.3. FLASH MAGIC SOFTWARE:

It is used to burn them. Hex file generated by the compiler into the IC. This is done by using the hardware kit wherein the IC is placed. It is then connected to the PC via its serial port for burning the code.

3.4. AT COMMANDS:

AT commands is used to control MODEMS. AT Commands with a GSM/GPRS MODEM or mobile phone can be used to access following information and services.

4. FINAL PROTOTYPE:

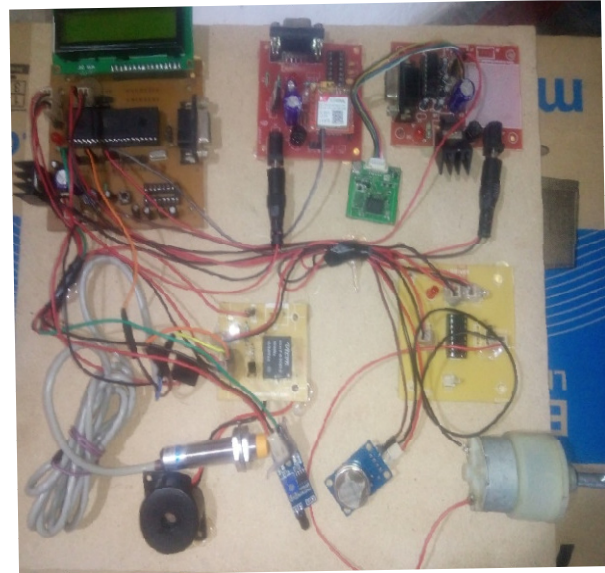Hardware circuitry of proposed system has shown below.

Fig.9: Final prototype

RESULTS AND DISCUSSION:

5.1. ALCOHOL DETECTION:

Whenever the alcohol is detected sends signals to microcontroller then microcontroller sends information in the form of signals to L293D IC then this IC disconnect the supply to car so car will stop automatically and SMS is sent to victims by using GSM modem.
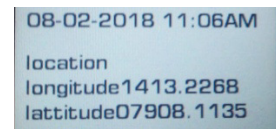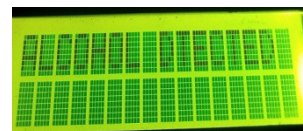

Fig.10: Result of alcohol detection with location

5.2. FIRE DETECTION:

Whenever the fire is occurred in the vehicle MQ-2 sensor sends signals to microcontroller then microcontroller sends information to the relay in the form of current and relay may activate and make a

connection to buzzer which can produce sound and total information is send to victims via SMS.

Fig.11: Result of fire detection with location

5.3. THEFT DETECTION:

Whenever the metal detector is activated it sends signals to microcontroller then microcontroller sends information to GSM and GPS through MAX232 IC then GSM send information about location of vehicle to victims via SMS by using GPS system.
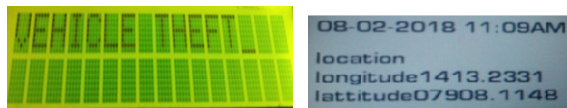

Fig.12: Result of theft detection with location

CONCLUSION:

By introducing the sensors and metal detector to microcontroller the system can works accurately and can give good results. By this system the accidents due to drunk and driving is reduced drastically, gives protection from fire accidents by rings an alarm and can automatically sends information to the victims about situation and location of vehicle which makes easier to find out the vehicle on theft and person on drunken driving.

REFERENCES:

1. International Journal of Scientific & Engineering Research, Volume 5, Issue 11, November-2014 599 ISSN 2229-5518.

2. Vehicle Tracking and Locking System Based on GSM and GPS by I.J. Intelligent Systems and Applications, 2013, 09, 86-93.

3. Chen, H., Chiang, Y. Chang, F., H. Wang, H. (2010). Toward Real-Time Precise Point Positioning: Differential GPS Based on IGS Ultra Rapid Product, SICE Annual Conference, the Grand Hotel, and Taipei, Taiwan August 18-21.

4. Nishiyama, Y. ISUZU Advanced Engineering Center LTD., Kanagawa, Japan Kondoh, A.Hirado, A.; Akiyama, H. "The system and the function of position regulated speed control device, Vehicle Navigation and Information Systems Conference", 1996. VNIS '96.

5. Murthy, C.; Manimaran, G.; "Resource Management in Real-Time Systems and Networks"2001.
6.Telaprolu, m.k,sarma, V.V.;.; ratankanth,E.K.;Rao,S.N.; Banda,v.," vehicular Electronics and safety(ICVES)",IEEE international conference pune (2009).