

EFFECTIVE CONTROL OF ACCIDENTS USING ROUTING AND TRACKING SYSTEM WITH INTEGRATED NETWORK OF SENSORS

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ABSTRACT

This Paper is emphasized on road accidents occurring due to Drunk and Drive (Alcohol sensor), inappropriate direction boards, negligence of the driver (sleep deprivation), health anomaly of the driver and enhance the security system of the vehicle. As the fatality rates due to accidents is increasing day by day, the above methods are implemented to decrease the fatality rate. The accidents due to the drowsy state of the driver is prevented using eye blink sensor. Similarly accidents due to the drunken state is prevented using alcohol sensor which detects the alcohol from breath of the driver and stops the engine. The aim is to prevent the accidents by providing receiver unit in vehicles along with transmitter unit at necessary places such as school zones, diversion zones, railway crossings and other accident prone zones to indicate about the respective places well in advance. Vehicles security are mandatory. So here we provide a keypad wherein a security code is set as per the owner's choice. When someone tries to start the car in the absence of the driver, an alarm which the driver owns will ring. Health anomaly of the driver is conversant through the GSM module.

INTRODUCTION:

This Paper was focused mainly on road accidents occurring due to poor indication of sign boards, drowsy state and drunken state of drivers in both two wheelers and four wheelers. As the fatality rates due to accidents is increasing day by day, the below methods are implemented to decrease the fatality rate.

The accidents due to the drowsy state of the driver is prevented using eye blink sensor which detects the drowsy state and alarms the driver using buzzer and a LCD message.

Similarly accidents due to the drunken state is prevented using alcohol sensor which detects the alcohol from breath and stops the engine by micro controller immediately and simultaneously giving an alertness through recorded voice and LCD message.

The aim is to in preventing the accidents by providing receiver unit in vehicles along with

transmitter unit at necessary places such as school zones, diversion zones, railway crossings and other accident prone zones to indicate about the respective places well in advance before reaching the spot by means of LCD message and as well as by a recorded voice.

Vehicles security are mandatory. So here we provide a keypad wherein a security code is set as per the owners choice. When someone tries to start the car in the absence of the driver, an alarm which the driver owns is rung.

Health anomaly of the driver is conversant through the GSM module. When the pulse rate of the driver is speckled, a message is sent to respective persons through the GSM receiver, where the number is already been stored.

PROPOSED SYSTEM:

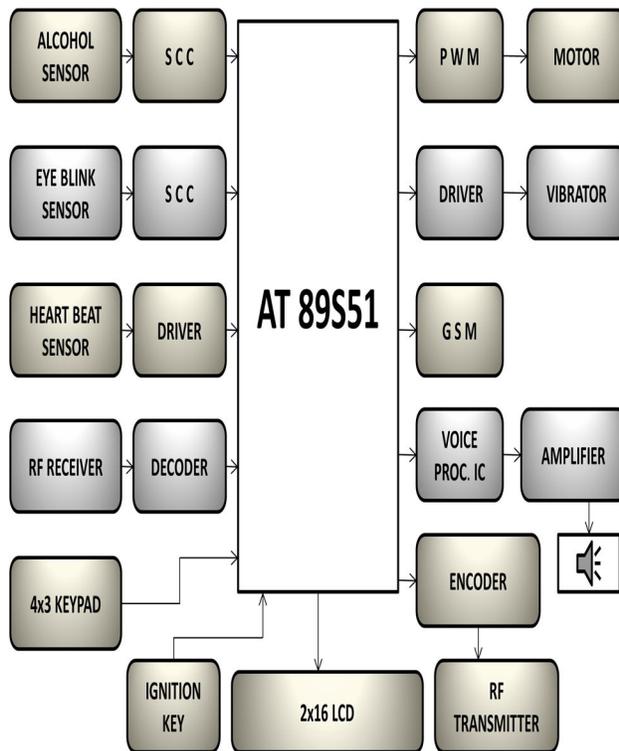
- Routing and Tracking System for Mobile Vehicles in Large Area.

- ZigBee-based Vehicle Access Control System.
- An Integrated Network of Roadside Sensors and Vehicles for Driving Safety.

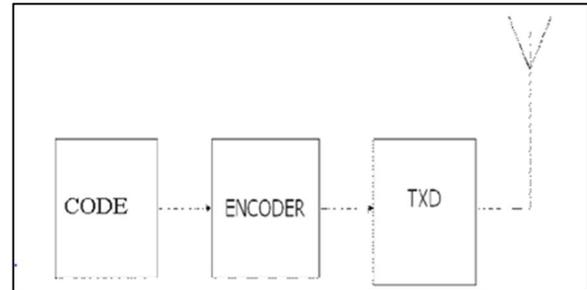
In the above proposed systems only a particular issue has been taken into consideration. Only any one of the factors can be prevented for preventing accidents and vehicle safety. Due to which the fatality rate is decreased marginally. This paper is an integrated system which deals with the security of the vehicle, drivers safety , public safety. In brief we have concentrated in almost all the factors that causes accidents in highways. This paper provides following advantages

- Decreasing the mortality rate.
- Increasing the security of the vehicle.
- Avoiding rash driving

BLOCK DIAGRAM:



TRANSMITTER UNIT:



1. IGNITION KEY:

Ignition key acts as a switch, and serves as a key for any vehicle to start up the engine. So that the driver of the vehicle was continuously monitored by the sensor. A vehicle ignition key device directly activates a rotary switch by a rotation driving mechanism remotely driven by an external control signal for stopping the engine of the vehicles, the rotary switch can be placed in ON, OFF and START positions by key operation, and a rotation driving mechanism activates the switch in each of the positions by receiving an external dispatched signal.

2. ENCODER:

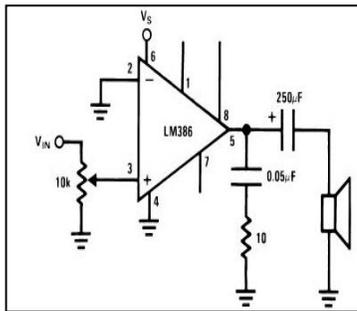
The 2^{12} encoders are a series of CMOS LSI/S for remote control system applications, they are capable of encoding information which consists of N address bits and 12N data bits, it converts the digital signal to digital frequency for coupling purpose. Its operating voltage is 2.4V-5V which has low power and high noise immunity; it is used in burglar alarm system, car alarm system and other remote control systems.

3. TRANSMITTER UNIT:

Transmitter module transmits RF code signal corresponding to the zones for eg 001 for hospital zone, 010 for school zone , 011 for hairpin curve, 100 for tree ahead.

APR 9600 is a low - cost high performance sound record /replay IC. It incorporates FLASH analog storage technique. The APR 9600 has a 20 – pin DIP package, its supply voltage is between 4.5 V to 6.5 V, the APR 9600 experimental board is an assembled PCB board consisting of an APR 9600 IC.

The integrated chip **LM386** is a low power audio frequency amplifier requiring a low level power supply (most often batteries). It comes in an 8-pin mini-DIP package. The IC is designed to deliver a voltage amplification of 20 without external add-on parts. But this voltage gain can be raised up to 200 ($V_u=200$).



LM386 Audio amplifier circuit

GSM (Global System for Mobile Communications, originally *Groupe Spécial Mobile*), is a standard set developed by the European Telecommunications Standards Institute (ETSI) to describe technologies for second generation (2G) digital cellular networks. Developed as a replacement for first generation (1G) analog cellular networks, the GSM standard originally described a digital, circuit switched network optimized for full duplex voice telephony. The standard was expanded over time to include first circuit switched data transport, then packet data transport via GPRS (General Packet Radio Services). Packet data transmission speeds were later increased via EDGE (Enhanced Data rates for GSM Evolution) referred as EGPRS.

A vibrator is a mechanical device to generate vibrations. The vibration is often generated by an electric motor with an unbalanced mass on its driveshaft. There are many different types of vibrator. Some are components of larger products such as cell phones, pagers, etc.

AT 24C04 EEPROM It's an electrically erasable programmable read only memory (EEPROM) Words of eight bit each, it's a 4k two – wire serial interface EEPROM which has an 8- bit device address word

RECEIVER UNIT:

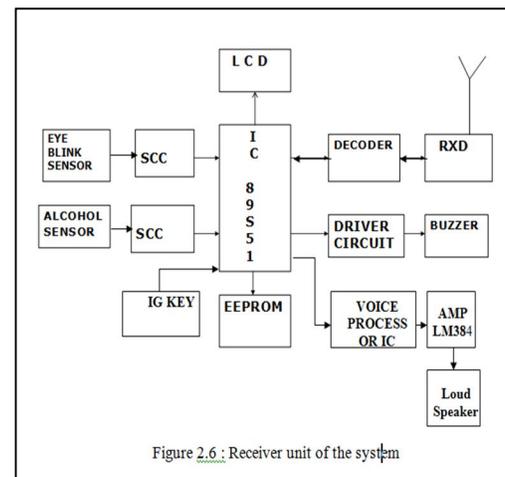


Figure 2.6 : Receiver unit of the system

1. EYEBLINK SENSOR:

The sensing element detects the optical muscle movement of eye continuously and amplifies to give a switching pulse output. The elastic strap holds the sensing element in place of vision muscle movements. It detects eye blink continuously to sense the drivers fatigue sleeping and alert the driver.



2. ALCOHOL SENSOR:

The sensing element detects the alcohol content from the breath of the driver continuously and amplifies it to give a switching pulse output and alarms the driver through the recorded voice and LCD. It detects the alcohol content continuously to sense the driver's drunken state and alerts the driver.



3. HEART BEAT SENSOR

Heart beat sensor is designed to give digital output of heart beat when a finger is placed on it. When the heart beat detector is working, the beat LED flashes in unison with each heart beat. This digital output can be connected to microcontroller directly to measure the Beats Per Minute (BPM) rate. It works on the principle of light modulation by blood flow through finger at each pulse.

3. DECODER:

The decoders receive serial addresses and data from a programmed 212 series of encoder that are transmitted by a carrier using an RF or an IR transmission medium. They compare the serial input

data three times continuously with their local addresses.

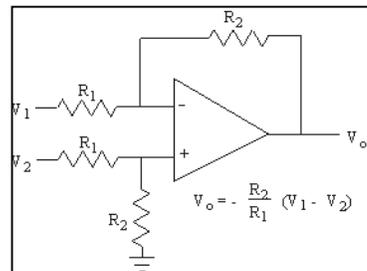
4. RF RECEIVER:

The receiver also operates at 433.92MHz, and has a sensitivity of 3uV. The RWS-434 receiver operates from 4.5 to 5.5 volts-DC, and has both linear and digital outputs.

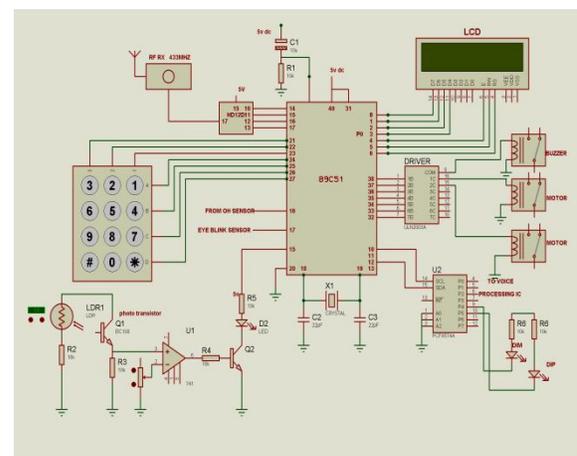
5. SIGNAL CONDITIONING CIRCUIT

In electronics, signal conditioning means manipulating an analog signal in such a way that it meets the requirements of the next stage for further processing. Most common use is in analog-to-digital converters.

In control engineering applications, it is common to have a sensing stage (which consists of a sensor), a signal conditioning stage (where usually amplification of the signal is done) and a processing stage.



CIRCUIT DIAGRAM:



CONCLUSION:

It has been daily trend for us to read lot of accident in newspaper happened mainly because of over speeding of vehicle i.e. rash driving, not following sign board and fatigue states of driver like drowsy, drunken state. In order to prevent this problem a device was designed for preventing accidents. The advantages are

- Receiver unit in vehicles along with transmitter unit at necessary places such as school zones, diversion zones, railway crossings and other accident prone zones to indicate about the respective places well in advance before reaching the spot by means of LCD message and as well as by a recorded voice.
- The accidents due to the drowsy state of the driver is prevented using eye blink sensor which detects the drowsy state and alarms the driver using buzzer and a LCD message.
- Accidents due to the drunken state is prevented using alcohol sensor which detects the alcohol from breath and stops the engine immediately and simultaneously gives an alertness through recorded voice and displays it on LCD message .
- This paper is gift for the society to prevent accidents in this crowded environment. Hope this paper is of no doubt to save precious human life.

APPLICATIONS:

It can be applied for following applications

- Implemented on vehicles in highways for reducing fatality rate.
- Health ailment of drivers are detected and accidents are reduced.

- Tracking of vehicle is done.
- Near school zones ,diversion zones and railway crossing.

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