

Car Black Box System

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Abstract : This paper presents the concept of car black box vehicle safety system which would not only record the data, but also gives indication like engine overheating, alcohol consumption etc. In the case of an accident the message is sent through the GSM to prescribed mobile numbers. For the security purpose, the password is given to the black box to secure or prevent the recorded data. User enters the password for authentication of black box for accessing recorded data. Recorded data is used to find out the proper & actual reason behind an accident.

Keywords: Black box, Authentication, GSM.

I. INTRODUCTION:

The Black Box is Event data Recording System.

The Car Black Box is similar to the data recorder on airplanes.

The Black Box is also known as Evidence Collecting System. The Evidence collecting System is vehicle based device which is used to collect data like Speed, Engine Temperature , Alcohol content ,

Seatbelt status(wear or not wear) , obstacle detection etc.

Collecting data is not only stored in memory (EEPROM) but also stored data can be used to investigate the crime, rescue operation and insurance claims.

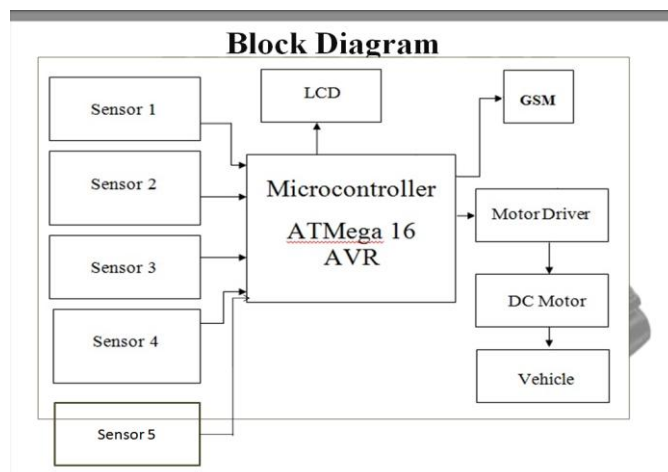
The received data from all the listed sensors is stored in memory (EEPROM) and send through GSM to the prescribed mobile numbers like police station , nearest hospitals and car owners.

The main purpose of the proposed work is : developing a prototype of black box for vehicle current status or diagnosis that can be installed in to any vehicle.

II. WORKING :

In this car black box controller receives data from all the listed sensors. Car black box is kept below the driver sit. In this system, we use five sensors,

1. Seatbelt sensor - check weather driver wears seatbelt or not. if not buzzer rings and led blinks and message should be displayed on LCD "Plz wear seatbelt".



2. Alcohol sensor - Detects the smell of alcohol and if alcohol consumed is detected the alarm rings LED blinks and display the MSG on LCD "driver is drunk".

3. Speed sensor - It is constantly monitored while vehicle is running and when the speed crosses its limit according to the set threshold value alarm rings and LED blinks and display the MSG on LCD "speed crosses its limit".

4. Temperature sensor - It constantly checks for temperature of engine with respect to heat of engine and if engine temperature crosses its threshold limit as per the set value LED blinks buzzer rings and message is displayed on LCD "engine is over heated".

5. Obstacle sensor - Obstacle is detected constantly while vehicle is running and whenever obstacle comes in front of vehicle, sensor senses that obstacle and LED blinks and buzzer rings and display MSG on LCD "please apply breaks".

All this data is stored on EEPROM

And when finally Accident occurs GSM will work as per programmed step by step:

1. MSG is sent via GSM to prescribed numbers car owner, nearest police station and hospital.
 2. Users enter password for authentication of black box for accessing recorded data.
 3. Recorded data for all the sensor is checked as per the working of sensor
 - A. Seat belt was wear or not check by seat belt sensor.
 - B. Whether driver was drunk or not check by alcohol sensor.
 - C. Check for speed through speed sensor.
 - D. Engine heat checked by temperature sensor.
 - E. Whether accident was due to obstacle is checked through obstacle sensor.
- And finally the reason of accident is concluded with the help of all the above recorded data.

III. EXPERIMENTAL RESULTS :

After testing car black box module we observe that :

- i) When power supply is given to the prototype, it starts and “Vehicle starts” this message is displayed on LCD.
- ii) After every message there is 5 to 9 sec. delay is given.
- iii) Continuous indication of recorded data in the form of message on LCD.
- iv) When sensor crosses its threshold value it is indicated through blinking LED’s & buzzer ringing.
- v) All data stored in EEPROM Memory .
- vi) When finally accident occurs messages are sent via GSM to prescribed numbers.

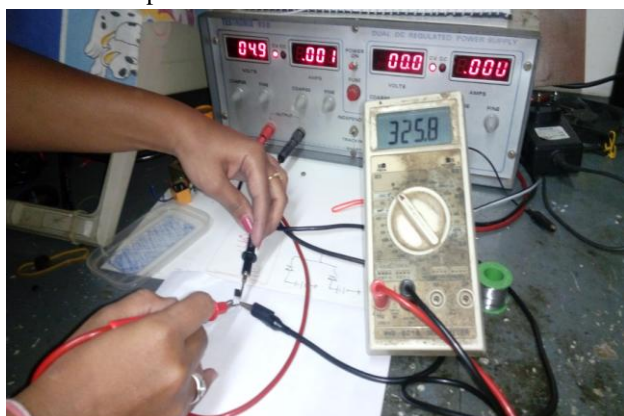


Fig., Sensor testing

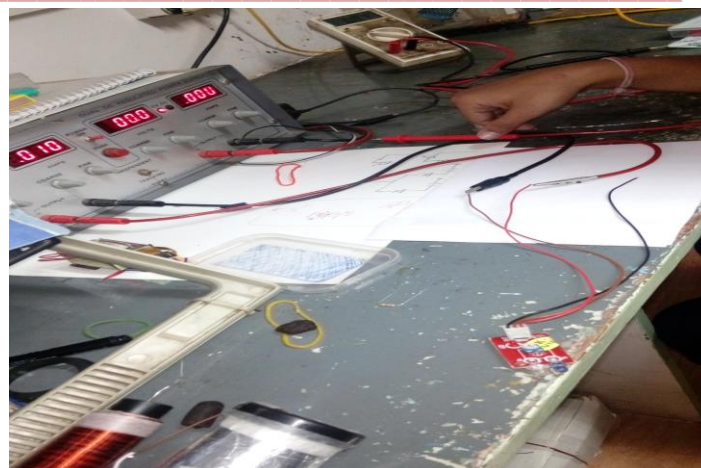


Fig., IR Range testing



Fig., Messages displayed on LCD Screen

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MH14 CD 1234 OBSTALE IS DETECTEDENGINE TEMP  
NORMAL DRIVER IS NOT DRUNKSEAT BELT WEAREDSPEED  
LIMIT NOT CROSSED
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Fig., message received by prescribed mobile number



Fig., Final prototype

IV. CONCLUSION :

This paper has offered a user friendly embedded program to analyze the data of the accident. The Black Box system built can be implemented in any vehicle. As soon as the driver runs the motor, this system will begin saving the events of the corresponding vehicle. The last are always saved in the

EEPROM of the Black Box. The data saved can be retrieved only after the accident for privacy purposes. Using serial transmission with EEPROM information is displayed to the user. In addition, a detailed report will be given to the user containing the recorded data in the memory.

V. REFERENCES:

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