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GSM-GPS based Modern Security and Control System for Vehicle

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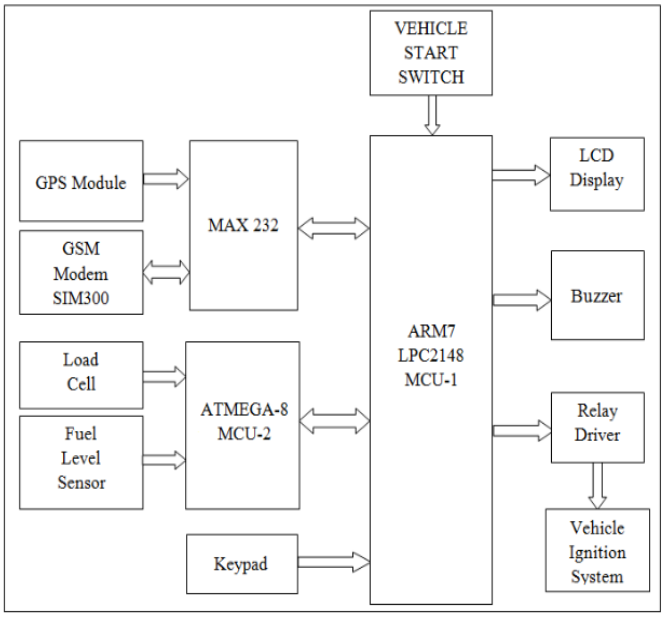
Abstract - *Now a day automobile thefts are increasing at very high rate everywhere. To avoid this there is a need of security system in the vehicles. For designing of security system various techniques are available which are dependent on level of security. As level of security increases, the cost and complexity of system is also increases. Historically it is seen that there are so many wireless technologies used in vehicle security system design. The wireless communication technologies such as Bluetooth, ZigBee, RFID and GSM can be used to control security system from remote places. Out of these wireless technologies Bluetooth, ZigBee and RFID have communication distance limit, whereas vehicle security system using GSM has no distance limit. This system is necessary for security, remote control and remote monitoring of the vehicle. Here security of vehicle is necessary to prevent vehicle from theft. The remote control of the vehicle is essential in case of unsecured conditions, to turn vehicle off from remote place by sending simple SMS. Monitoring of vehicle is essential to observe some important parameters like load within vehicle and fuel level in the tank from remote place. Along with vehicle security this system is necessary to reduce air pollution due to the fuel consumption by vehicle.*

1. INTRODUCTION

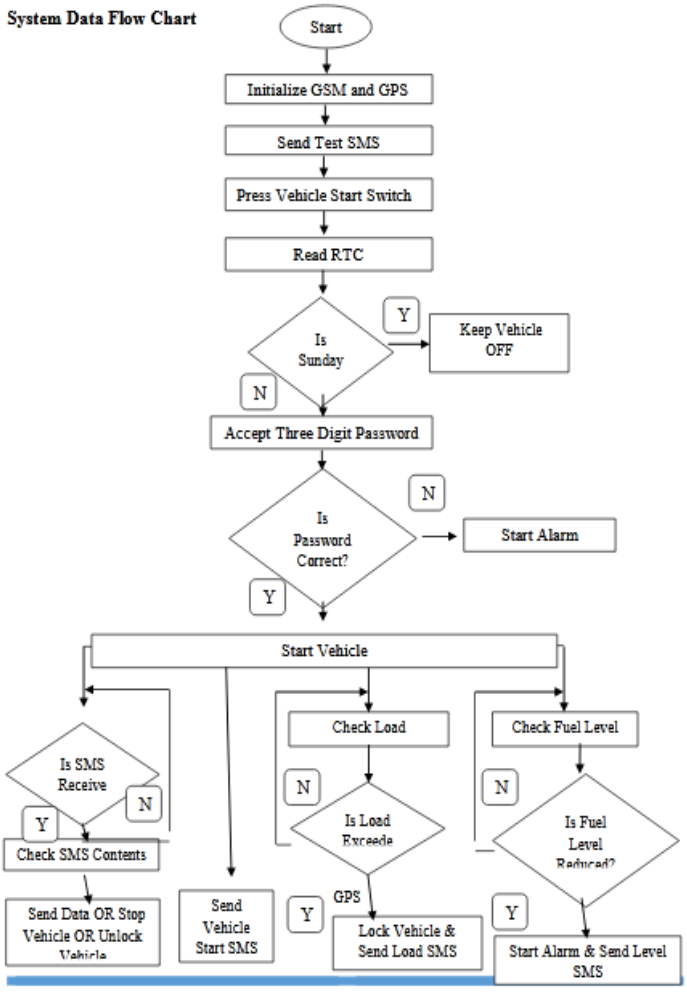
The proposed system "GSM-GPS Based Morden Security And Control System For Vehicle" is based on GSM (Global System for Mobile Communication) and GPS (Global Positioning System) technology which is used to protect vehicle from thieves, through entering a protected password and intimate the status and location of the same vehicle to the vehicle owner. Not only this system is used for theft prevention but, can be used to monitor and control vehicle from remote place. To design this system ARM7 LPC2148 along with Atmega8 microcontrollers are used. Due to this system vehicle remains in off state on every Sunday to minimize air pollution caused by fuel consumption. To provide day and time information, internal RTC of LPC2148 microcontroller is initialized. Except Sunday, system asks for correct password from user to start vehicle. When correct password is entered then vehicle ignition system control relay is turned on which starts the vehicle. When vehicle is started immediately a text message is sent to the vehicle owner regarding start of vehicle. If entered password is wrong, vehicle remains in off state and immediately buzzer is on. There are two ways by which vehicle is can be locked, the first one is by sending SMS manually and second one is automatically in case of overload within the vehicle. If any unsecure condition arises then vehicle can be locked completely, by sending "off" SMS from remote place. Once vehicle is locked the only way to unlock it is, send a SMS "on". In this system GPS module continuously provide latitude and longitude coordinates data, regarding location of the vehicle. When location of vehicle is requested then LPC2148 microcontroller at security unit processes the data provided by GPS module and only required data about location of vehicle is transferred to the other end (recipient unit) in the form of SMS.

Along with security feature this system is used to monitor load within vehicle and fuel level in fuel tank. The load in vehicle gets increased due to entry of any person or due to the luggage. Many times, the owner of vehicle instructs to driver of vehicle, not to allow any passenger or luggage in vehicle during travel, but it is not guaranteed that driver follow the instruction. In proposed system Load Cell is used, which keeps eye on driver in such a way that if the load in vehicle is exceeded above predefined level then automatically SMS alert is sent to the owner of vehicle to take appropriate action against it. Since day by day demand and price of fuel is increasing so that theft of fuel from fuel tanks of stationary vehicles and transport tankers is also increasing. So, almost all vehicle manufacturing companies are looking for solutions to monitor fuel levels during both storage and transportation. To know status of fuel level in tank from remote place the proposed system has Float Switch sensor to sense the fuel level in tank. If fuel level within is reduced below predefined level, then security unit automatically sends SMS through GSM network to the vehicle owner. When fuel level is reduced, automatically buzzer is turned on, so that nearby persons get attention towards vehicle.

1.1 Block diagram:



1.2 Flow chart:



2. BLOCK DIAGRAM DESCRIPTION:

Hardware part used

- LPC2148 Microcontroller .
- GPS Module.
- GSM Modem .
- Load Cell (Model
- Float Switch (FLT001)
- Liquid Crystal Display (LCD), Relay, Power Supply.

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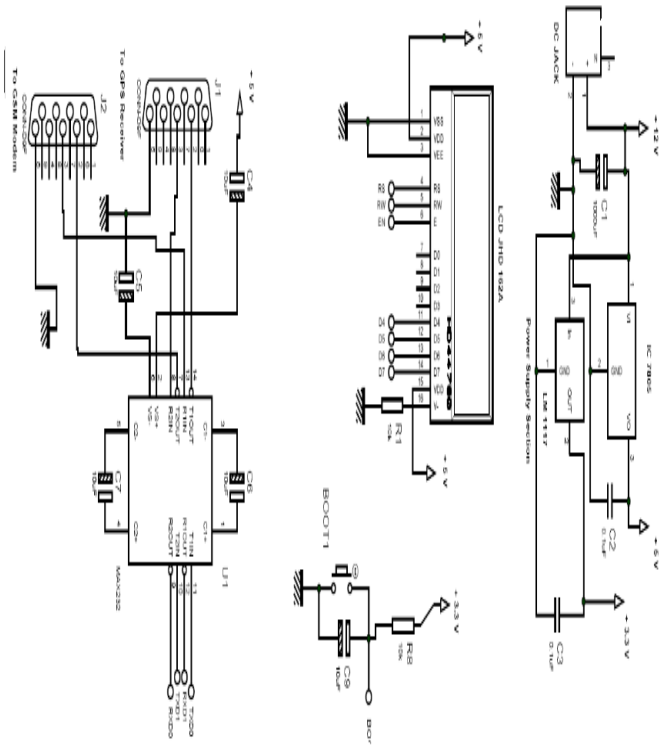
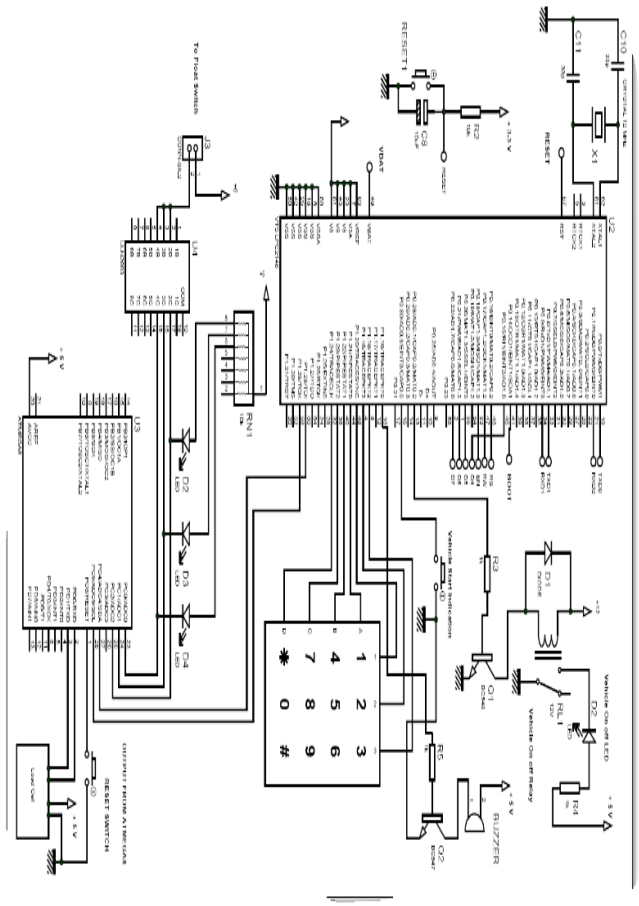
Circuit diagram:





3. CONCLUSIONS

The proposed system, "GSM-GPS Based Modern Security and Control System for Vehicle" is important for moving vehicles in large cities. After installing this system in vehicle, it is difficult for unknown person to start vehicle. In case of vehicle theft if location request is sent then the location of vehicle is displayed on Google map. This system helps the owner of vehicle in different ways as, to detect the overload within vehicle, to detect reduced fuel level in fuel tank, to track location of vehicle and to control the vehicle from remote place. With this system vehicle is automatically locked in case of overload or by sending SMS. With this system, vehicle remains off on every Sunday which gives benefit to minimization of air pollution. The test results of the system are very good, which shows that system works very well. System is very much accurate to find location of the vehicle and to protect vehicle from overload. Only this system has limitations in case of poor GSM and satellite network for GPS. If GSM network is poor, then system is unable to communicate properly.

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BIOGRAPHIES

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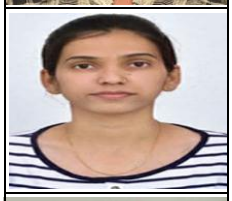

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