

E-Penalty Using Smart Card for Improving Road and Transport Safety

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Abstract— An effective Government should provide an efficient solution for the offenders, who violate the traffic rules & cause unnatural deaths due to breaking of signal or rash driving in India. Many government plans been executed & running successfully like vehicle.

Who break the traffic rules on road penalty can be imposed on offenders using vehicle smart card with the help of RFID. This method to solve the problem of disorder of traffic signal caused by huge vehicles. In this system of a ARM processor with a RF module is to be used at major traffic and is programmed to connect to each vehicle passing by. Each vehicle would be installed with a system comprising of ARM processor and receiver side of RF module so that it can receive signals from the signal side and display signal status on the traffic signal status display system installed inside the vehicle.

This system installed to the crazy drivers coming together of two or more moving objects, such as vehicles warnings to the driver. This project is used to ignore the accidents and follow the traffic rules.

Keywords— ARM processor, GSM module, ISP section, LCD section, RFID module, RFID reader, RFID tag, smart card, Wireless communication.

I. INTRODUCTION

India is the most full of people country in the world. It is seeing terrible road congestion problems in its cities Infrastructure growth is slow as compared to the growth in numbers of vehicle ,due to space and cost constraints It needs a traffic control solutions, which are different from the developed countries Intelligent management of traffic flows can reduce the negative impact of congestion.

Technologies like a RFID, GSM can be used in traffic control to provide cost effective solutions. RFID is a wireless technology that uses radio frequency electromagnetic energy to carry information between RFID tag RFID readers.

A GSM modem is a specialized type of modem, which accepts a SIM card and operates over a subscription to a mobile operator just like a mobile phone AT COMMAND ARE USED O CONTROL modems.

Objectives

The objective of this paper is to design a model for smart city with a smart traffic light system with penalty based after breaking traffic rules and internet of things that provides intelligence to a city.



Fig. 1 Unmanaged Heavy traffic in India

This system can automatically deduct the amount from the vehicle's smart card after breaking of traffic signal.

Every day citizens die in accident on the road and every day people lose so many hours in traffic congestion during the day and night. These problems have implication, including damage to public and private property.

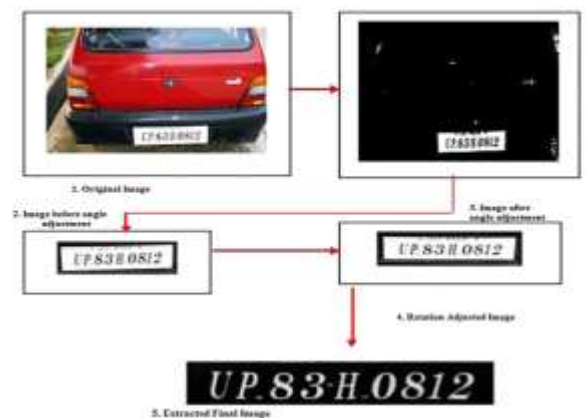


Fig. 2 Numberplate Identification

II.METHODOLOGY

A. Vehicle Unit

RFID Reader unit is installed on Signal Pole unit as shown in fig 3. In case of driver break the signal then it reads the RFID Tag which is connected to the Car Unit. After deducting the fine amount GSM unit connected on Pole side will send the SMS to the register contact number of car owner.

As shown in fig.5 this System LPC 2138 is used as a controller. LPC 2138 uses ARM7 as its processor MAX232 IC is used for connecting RF modem & pc connection to interface with LPC2138 as shown in fig. 5.

Max232 is 16 pin IC. In this we are connecting 4capacitor externally to the MAX232 for removing the noise of during conversion of the voltage. Smart card is connected to pin P0.2 to P0.4. Name of smart card IC is AT24CO4. Its 5 pin device Namely SCLK, SDAT, VCC, GRD, CARD PRESENT.

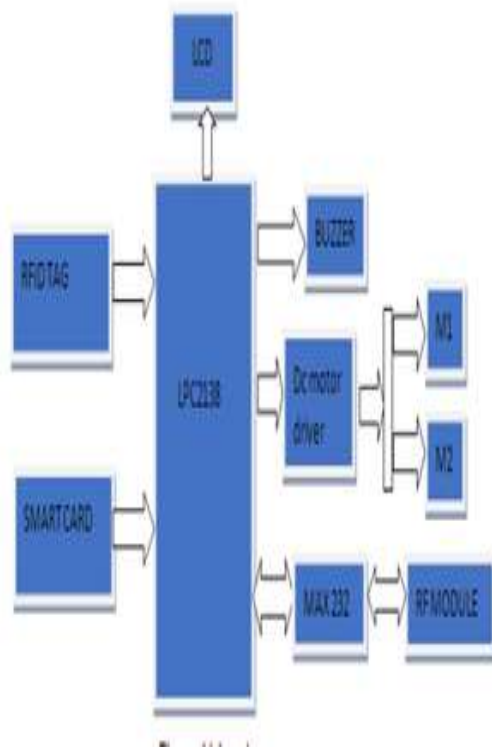


Fig. 3 vehicle unit of proposed system

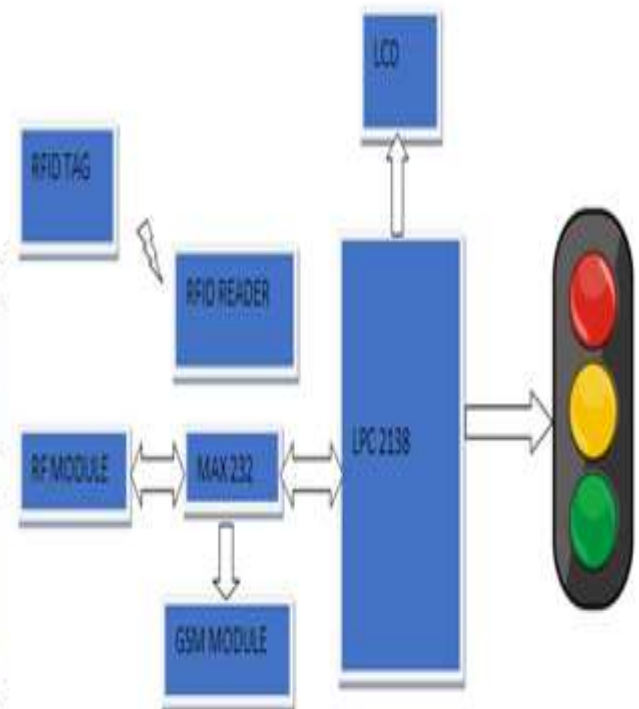


Fig. 4 Signal pole unit of proposed system

B. Signal Pole Unit

RFID tag is connected to the vehicle as shown in fig. 4. Smart card which inter linked with the RFID Tag unit is also present in Car. The Smart has certain amount in case of braking of traffics rule specific amount will be deducted from it. This automatic system will reduce police effort and unnecessary clashes of driver with police.

After the amount deducted person will be notified by Text message. In this system if person don't have the balance in Smart card that time some amount will be credited to that person Smart card. Main advantages of this system is that due lack man power if police is not present at signal and driver breaks unnecessarily signal then amount will be deducted automatically which tend to indirect increase in government revenue.

I. RESULTS & DISCUSSION

A. Simulation of Vehicle Unit

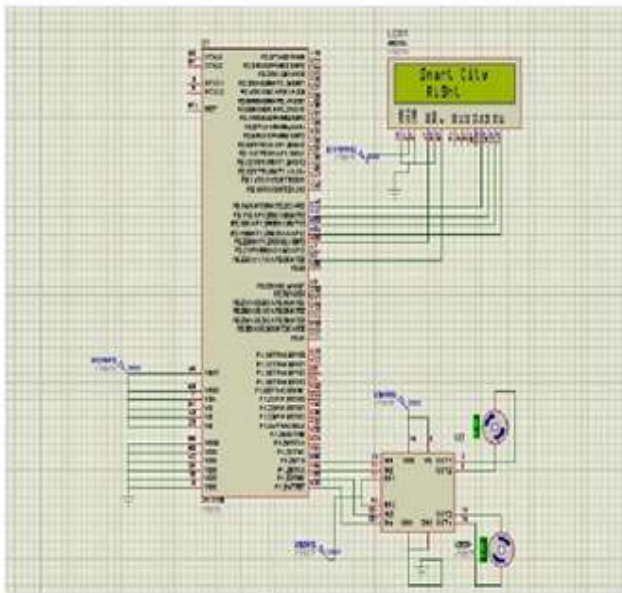


Fig. 5 simulation of vehicle unit

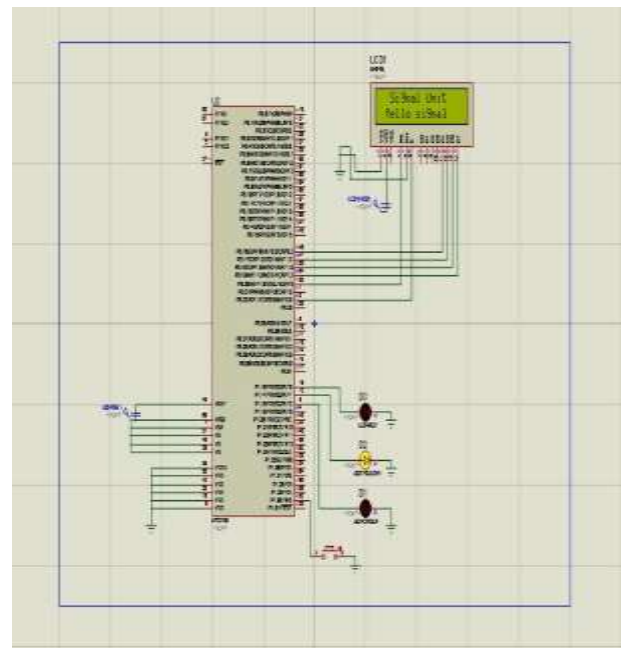


Fig. 6 simulation of signal pole unit

B. Simulation of Signal Pole Unit

LPC2138 is used as a controller and heart of our system.

In this project we used the 4 section.

1. RF module.
2. GSM module.
3. RFID reader.
4. ISP section.

RFID is a 4 pin one is VCC, one GND, two data line D0 &D1.

This two data line is connected to interrupt pin port P0.15

&P0.30. GSM module is connected to UART1 of pin P0.8&P0.9.

LCD is interfacing withP0.16 to P0.19 data line D4 - D7 and

P0.20 is connected to RS with P0.22 is connected to EN of the

LCD as shown in fig.6 and we are grounding the pin R/W as it's write operation get select.

ISP and RESET connected is given to the P0.14 and RESET pin.

The state transport department is set to ontrouction high security registration. There will be to new RFID chip for the ront and rear of the vehicle. The RFID chip will help to digitize record and keep track of any vehicle on the road and by scanning is using a chip reader. These chips will stores data for car owner, including registration details. Fig.7 shows the hardware part of e penalty using smart card and also shows the penalty on LCD when any vehicle breaks the signal.



Fig. 7 Hard-ware of e-penalty using smart card

II. CONCLUSIONS

We propose a system which will be help the govenment and as well as society in many ways.

Government may generate more revenu by traffic control department as there is no chance to bribe in E-penalty system so the corruption ; bribe have either been reduce.

citizen will not be harassed by the traffic control officer which is very general in case of offender caught by a police officer after violating the traffic rules.

if a vehicle caught in violation of traffic rule it can be penalised in a vehicle smart card. for automatic deduction of amount and to interaction among the village, district, state.

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