

Design and Implementation of Smart Automobile System

H. R. Zinage^{1*}, O. B. Heddurshetti², S. S. Birade³

¹Department of Electrical & Electronics Engineering, Hirasugar Institute of Technology, Nidasoshi, India

²Department of Electrical & Electronics Engineering, Hirasugar Institute of Technology, Nidasoshi, India

³Department of Electrical & Electronics Engineering, Hirasugar Institute of Technology, Nidasoshi, India

Abstract – Amidst the rapid increase in population and urbanization, the use of automobiles is increasing rapidly. Though there are improved safety and security features with advancement in technology, there are no vehicle regulatory systems that provide automation in vehicle monitoring and act violations. The main objective of the work is to have a centralized server based monitoring of vehicles with an advanced security. A unique id is allotted for the vehicle and RFID card (smart card driving license) can be used to identify the object. This provides a way for reducing any possibility of corruption in motor vehicles section. Embedded system is well known for its compact size, processing speed etc. and plays a leading role in security and process management. This security system is simple and cost effective. The major benefit of this proposal is that the secure usage of the driving license & vehicle would be greatly enhanced.

Index terms- Safe Automobiles, Alcohol Sensor, RTO, Vehicle License , RC Book, GSM, RFID

I. INTRODUCTION

In this paper we propose to have a Smart card driving license which is a plastic card with a chip containing some KB of memory is widely used in many countries. The details about the license holder like his/her name, address, computer generated license number, date of issue and digital signature will be recorded in the computerized database and also on the chip. Radio Frequency Identification (RFID) is a common term used to depict a system utilizing radio waves by which the object or person is identified by means of a unique serial number. A centralized database management system on the other hand has many advantages in taking the technology to the next level. The microcontrollers are very useful to an extent in communicating with the devices such as displays, sensors etc.

The work deals with the federalization of vehicle act automation which has a centralized database helps in maintaining the data's of vehicles and drivers. The RFID based system helps in tracking the vehicles and collecting the penalties/toll charges directly from their bank accounts. GSM are the most effective and are widely used wireless communication techniques. The GSM module helps to notify the persons about the debited charge amount and the reason for the

deduction. This security system is simple and cost effective.

II. TECHNOLOGY USED:

RFID SYSTEM:

An RFID system may consist of several components: tags/transponders, tag readers, antenna, and middleware/application software. The purpose of an RFID system is to enable data to be transmitted by a mobile device, called a tag, which is read by an RFID reader.

RFID Readers:

The RFID reader is designed for fast and easy system integration without losing performance, functionality or security. The RFID reader consists of a real time processor, operating system, virtual portable memory, and transmitter/receiver unit in one small self-contained module that is easily installed in the ceiling or in any other convenient location. A reader, also called interrogator, comprises of a transmitter, receiver, control module and a transceiver.

GSM:

GSM, which stands for Global System for Mobile communications, reigns (important) as the world's most widely used cell phone technology. Cell phones use a cell phone service carrier's GSM network by searching for cell phone towers in the nearby area. Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900MHz. It is estimated that many countries outside of Europe will join the GSM partnership.

GSM is already used worldwide with over 450 million subscribers. International roaming permits subscribers to use one phone throughout Western Europe. CDMA will work in Asia, but not France, Germany, the U.K. and other popular European destinations. GSM is mature, having started in the mid-80s. This maturity means a more stable network with robust features. CDMA is still building its network. GSM maturity means engineers cut their teeth on the technology, creating an unconscious preference. The availability of Subscriber Identity Modules, which are smart cards that provide secure data encryption give GSM m-commerce advantages.

III. BLOCK DIAGRAM

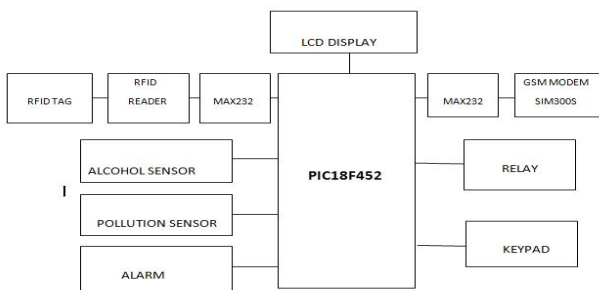


Fig. 1 Block diagram representation

Whenever the user inserts the RFID card (Driving license) the information contained in the RFID tag will be read by the RFID Reader. RFID Reader will send the required information to the microcontroller (PIC18F452) using MAX232 (data interface). Based on the information sent by the reader the microcontroller (PIC18F452) will command the LCD to display the appropriate message. At the same moment microcontroller will send the Electronic driving license details to the RTO station by using GSM modem (SIM300S) through MAX232 data interface. Driving license details will be verified in the RTO station. The verification message will be displayed on LCD. If the license is not verified the vehicle will not start. If the

Alcohol is detected the buzzer will beep and engine will be stopped.

The pollution sensor fitted at silencer will play the buzzer if the emission is crossing the permitted level of pollution. And the message will get displayed. At the same time this information will be sent to RTO through GSM.

IV. FLOWCHART OF THE PROPOSED SYSTEM:

The overall operation of the module can be studied in this flowchart. If the driver is found violating any of the safety conditions the engine of the vehicle will be blocked. And RTO will also get the information timely.

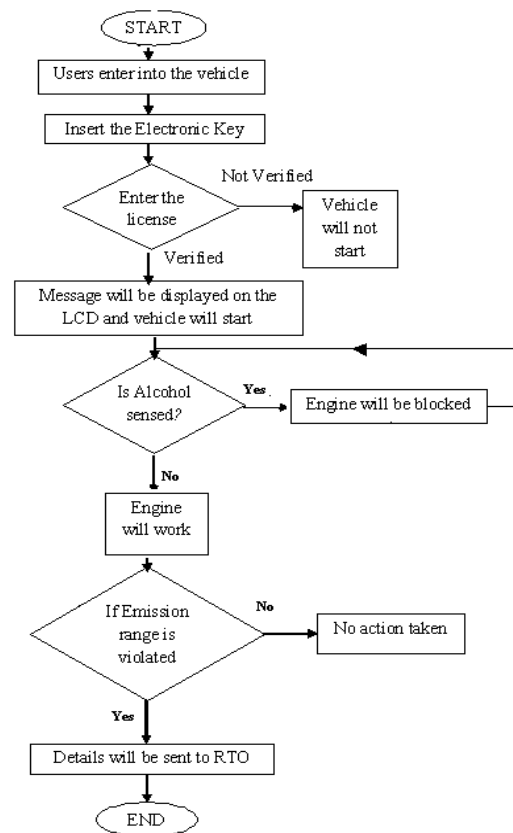


Fig. 2 Flow Graph

V. PROTOTYPE DESIGN

The picture in fig.3 shows the prototype of the proposed design. When driver enters the car, the system will get ON. First the driving license will be verified and simultaneously the details will be sent to RTO using GSM modem. RC details are also checked and the information is updated with RTO.

If the driver has consumed alcohol the engine of the vehicle will be blocked. The emitted gases are crossing the safety limits the message gets displayed on the LCD screen and the information is sent to RTO.

In case the vehicle gets collided with something the message will be sent to RTO, it will help them to locate the accident spot.

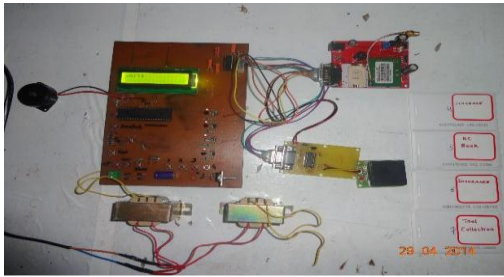


Fig. 3 Prototype model



Fig. 4 message on the LCD



Fig. 5 emission test message



Fig. 6 License details



Fig.7 Verification messages

VI. ADVANTAGES:

This model provides an efficient & low cost design for safe and corruption free automobiles. The power consumption of this model is also low. This system gives the owner remote access to the vehicle's ignition system further reducing chances of vehicle theft. Improving data accuracy & maintenance of data is easy. Proposed system provides high level of security in accessing the vehicles.

VII. LIMITATIONS:

To install this model into car need to use external wiring without disturbing the wiring that already exists into car.

The system is prone to tampering generally car owner's unwilling to disturb the décor of the car. range of RFID reader is limited.

VIII. CONCLUSION:

The proposed model is designed to provide an efficient solution for license RC book for high ways using RFID. This system also enables the remote monitoring and control of alcohol based on RFID technology. Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

The proposed model is mainly intended to provide an efficient solution for license, RC book for high ways using RFID. This system also enables the remote monitoring and control of alcohol based on RFID technology. The model makes use of a microcontroller, which acts as a central controlling unit. This module is capable of communicating with the input and the output modules. The user initially has to in the card number. The input module is the RFID reader which decodes the RFID tag which is

with the vehicle and sends the sms directly from the RFID tag (card number) by user pressing withdrawal control button. The output module is formed by the GSM modem and also displays the status of the gate on LCD. The Microcontroller is programmed using Embedded C language. This project can be extended using a GPS module and 3G technology.

REFERENCES:

A Prototype of a Fingerprint Based Ignition Systems in Vehicles, Omidiora E. O. &Fakolujo O. A. European Journal of Scientific Research ISSN 1450-216X Vol.62 No.2 (2011), pp. 164-171

Finger Vein Based Licensing & Authentication Scheme Using GSM,D. Divya, S.Padmasarath, IOSR Journal of Computer Engineering (IOSR-JCEe-ISSN: 2278-0661, p-ISSN: 2278-8727Volume 15, Issue 3 (Nov. - Dec. 2013), PP 30-35

Automobile Driver Recognition under Different Physiological Conditions using the Electrocardiogram byKhairulAzamiSidek, Ibrahim Khalil, RMIT University, Melbourne, Victoria, Australia

Payment Automation at Toll-Gate Using RFID and SMS Alert, NageswaraRao, V.Rajesh, IJECT Vol. 2, SP-1, Dec. 2011, ISSN: 2230-7109(Online) | ISSN: 2230-9543(Print)

Embedded Based Conveyance Authentication and Notification System, S. Dharanya et al. / International Journal of Engineering and Technology (IJET)

Next Generation Engine Immobilizer,International Journal of Research in Engineering and Technology e-ISSN: 2319-1163 | p-ISSN: 2321-7308

Corresponding Author

H. R. Zinage*

Department of Electrical & Electronics Engineering,
Hirasugar Institute of Technology, Nidasoshi, India

E-Mail – hrzinage.eee@hsit.ac.in