

Vehicle Fitted Driving License Based Security and Road Safety System – Part 1

M. Rajesh^[1], K. Vignesh Ramanathan^[2], R. Jagadish^[2], S. Dhayalan^[2]

Associate Professor, Department of Automobile Engineering, Karpaga Vinayaga College of Engineering and Technology, Kanchipuram, Tamilnadu, India^[1].

Final Year UG Student, Department of Automobile Engineering, Karpaga Vinayaga College of Engineering and Technology, Kanchipuram, Tamilnadu, India^[2].

ABSTRACT: Driving without licence is a major cause of road accidents. This project is based on smart driving licence card which would enhance road safety and vehicle security. The card helps to limit the vehicle operation on the basis of three parameters; driving licence expiry date, vehicle ownership and category of the vehicle for which driving licence is issued. The hardware and software systems required to improve safety and security is developed. A unique authentication card is encrypted with a secret code and the details of the vehicle it is associated with. Anyone other than the vehicle owner will be allowed to drive the vehicle using the authentication card. If not authorized, when a person attempts to start the vehicle, the short message service [SMS] system sends the driving licence details to a pre-registered mobile number and the vehicle's ignition system is disabled. This paper reports simulation work of the system.

KEYWORDS: Smart Driving licence, Automotive Theft, Road safety, Automotive Electronics.

I.INTRODUCTION

Modern automobiles are protected by various security systems which are expensive^[1]. The objective of the work is to develop a cheap and dependable security system for automobiles. The user friendly device “**Licentronic System**” uses a microcontroller which is interfaced with other peripherals like GSM (Global System for Mobile) and RFID (Radio Frequency Identification) reader.

If a person is licenced to drive a particular category of vehicle, the system will permit the vehicle to be used once both the authentication and the driving licence cards are validated. The unique authentication card is vehicle specific and contains the ownership details. For anyone, other than the registered owner, to use the vehicle, the authentication card is to be validated first. Before the vehicle starts, the RFID reader^[2] reads three parameters [driving licence expiry date, vehicle ownership and category of the vehicle for which driving licence is issued] of the smart driving licence. Once these parameters are validated by the microcontroller; the ignition system will be switched on. If the driving licence card is expired or if the person is not licenced to drive the vehicle category, the microcontroller will not allow the vehicle to be operated. In any case, if vehicle operation is not allowed, the system sends an alert to a pre-registered mobile number. The mobile number receives the details of the driving licence which is being used to drive the vehicle.

The main aim of this project is to allow or deny permission to operate a vehicle, on the basis of driving licence and vehicle ownership. A driver should possess a valid driving licence to drive a vehicle. This prevents one from driving a vehicle if he/she is not licenced and helps in reducing road accidents.

II. THE 'LICENTRONIC' SYSTEM

The block diagram given below shows the 'LICENTRONIC' system. When the ignition key is switched 'ON', the card reader prepares to scan authentication card and smart driving licence card. When both the card is validated, the microprocessor switches on the ignition system. Now the If validity of anyone or both the cards could not be established, the microprocessor sends the details of the invalid card to a pre registered mobile number simultaneously the vehicle doesn't start.

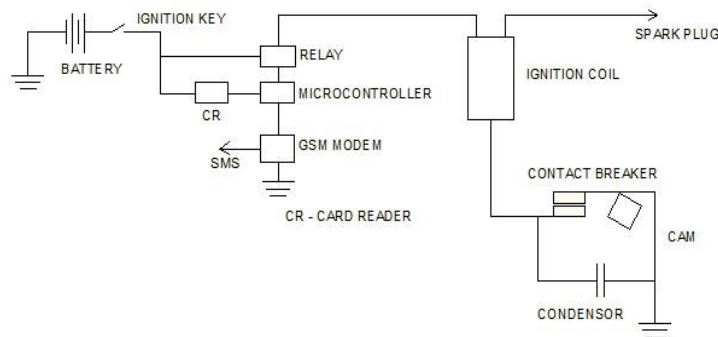


Figure 1: Licentronic System

III. SIMULATION WORK

The circuit is designed using the software PROTEUS 7.7 [4, 5] and the algorithm is simulated with the help of 'keil-u-vision' [1]. Simulation is done for situations which represent 6 different attempts to start the vehicle.

In the block diagram given below, each switch represents different cases.

The 'Case 1' represents a valid driving licence card. All that the registered owner has to do, to drive his vehicle, is to get his driving licence validated by the system. It allows the driver to run the vehicle if it is valid.

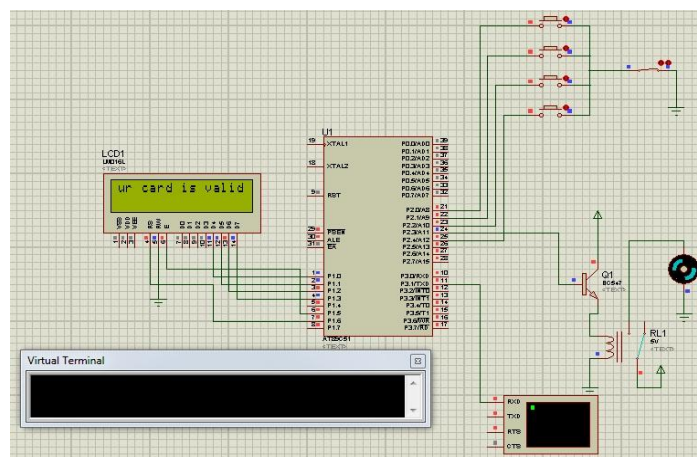


Figure 2: Simulation for Valid licence

The ‘Case 2’ represents usage of an expired driving licence card. It does not allow the owner to run the vehicle until the driving license is renewed. If the driving licence has expired, it informs the owner to renew the licence and the ignition system is disabled.

The ‘Case 3’ represents an attempt to use the vehicle by someone who is not the registered owner. When the unauthorized person tries to access the vehicle, the security system alerts the owner by sending a SMS to the pre-registered mobile number and the ignition system is disabled.

The ‘Case 4’ represents an attempt to use the vehicle by someone who is not the registered owner and in possession of the unique authorization card of the vehicle. When the person tries to validate the unique authorization card, he will be allowed to use the vehicle provided his driving licence is valid by all means. To keep the owner informed, the system sends a SMS to the pre-registered mobile number.

The ‘Case 5’ represents an attempt to use the vehicle by someone who is not licenced to drive the particular category of vehicle, as in the case of a two wheeler driving licence holder trying to drive a passenger car. In this case, the display shows ‘YOU ARE NOT ALLOWED TO DRIVE THIS CATEGORY OF VEHICLE’.

The ‘Case 6’ represents an attempt to use the vehicle by someone who is holding an authentication card which is not unique to the particular vehicle. In this case also the security system alerts the owner by sending a SMS to the pre-registered mobile number and the ignition system is disabled.

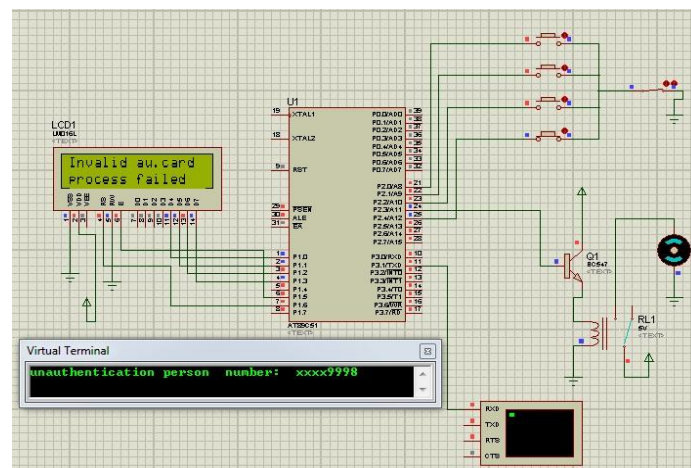


Figure 3: Simulation for authentication card

The registered owner can by-pass the security system one step by using a unique alpha-numeric code keyed into the key pad of the security system. In case of emergency, the owner can allow anyone to use this provision and the secret code can be changed by the registered owner.

IV. CONCLUSION AND FUTURE SCOPE

This work deals with the design & development of a driving licence based security system for an automobile. This system prevents vehicle theft and driving without proper driving licence. The simulation of the system is done using PROTEUS 7.7 software. A physical system is under development and will be tested for effectiveness. The system will increase road safety and reduce vehicle theft. If installed in all the vehicles, it will be of use for the society as well as the law enforcement department.

International Journal of Innovative Research in Science, Engineering and Technology

An ISO 3297: 2007 Certified Organization,

Volume 4, Special Issue 4, April 2015

National Conference on Trends in Automotive Parts Systems and Applications (TAPSA-2015)

On 20th & 21st March

Organized by

Sri Krishna College of Engineering & Technology, Kuniyathur, Coimbatore-641008, Tamilnadu, India

Ideally, this system could be made more convenient and effective with the use of satellite modems, instead of cell phones, as tracking device as the present system may fail when there is no cellular network coverage. This setup can be made more powerful with the help of a pinhole camera and GPS tracking device. The image captured by the camera and GPS data may be send to owner's mobile phone and the data can be identify the thief and retries the vehicle.

ACKNOWLEDGMENT

I would like to thank Mr. M. Rajesh (Professor and HOD) of Automobile Engineering Department, Karpaga Vinayaga College of Engineering and Technology, Kanchipuram for his valuable support to develop this project.

REFERENCES

- [1] Shital Y. Gaikwad and Maheshwari "V. C, Security System for Car using RFID, Thumb Impression, Steering wheel Lock Based on ARM 7"
International Journal of Current Engineering and Technology Vol.4, No.3 (June 2014)
- [2] PriyaDarshini and Prasannabalaje S.M , "Multilevel Security System for Automotives using RFID and Biometric Techniques in Lab view"
International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering Vol. 2, Issue 4, April 2013
- [3]Amol S. Dhotre, Abhishek S. Chandurkar& S. S. Jadhav, "Design of a GSM Cell – Phone based Vehicle Monitoring & Theft Security System"
International Journal of Electrical and Electronics Engineering (IJEEE) ISSN (PRINT): 2231 – 5284, Vol-1, Iss-3, 2012
- [4]Visa M. Ibrahim, Asogwa A. Victor " Microcontroller Based Anti-theft Security System Using GSM Networks with Text Message as Feedback"
International Journal of Engineering Research and Development e-ISSN: 2278-067X, p-ISSN: 2278-800X, www.ijerd.com Volume 2, Issue 10 (August 2012), PP. 18-22
- [5] B.ANUSHA, P.VENGAMAMBA, P.SWATHI, S.RAMYA, "Finger print based licensing system for driving" Mekapati Rajamohan Reddy institute of technology and sciences affiliated to JNTUA, Udayagiri, S.P. S. R. Nellore. (PG Project report)