

Advanced Security System Using GPRS Technology at RFID Based Toll Gate

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Abstract- This is an IOT based project. The notion of this paper emphasizes the “Advanced security system using GPRS technology at RFID based toll gate”. This paper gives a clear vision of toll collection system. After buying any vehicle is to do is it has to be registered in RTO office Before assuring a number plate to the vehicle every vehicle attaches a RFID tag attached to windscreen of the vehicle. The data of each and every vehicle is recorded in advance. So every vehicle arriving nearby toll plaza not only scans the RFID tag and if it is valid the amount is reduced, if not it blocks the vehicle. This provides more security that proposes a design using GSM and GPRS. With the advent of using this GPRS technology the amount of data required can be transferred to & from the mobile device over internet.

Keywords--LPC 2148, GSM,RFID, GPRS.

1. INTRODUCTION

This is an IOT based automated toll collection system. With the rising number of vehicles toll plazas have its prominence. With the advent of making use of this system it not only helps the police in finding criminals, but it does vehicle theft detection and can track the person as well as vehicle. This IOT projects is ever-growing network that feature an IP address of internet connectivity. We can collect the data, send, using embedded sensors, processors and communication hardware.

This paper gives a clear vision of toll collection system. The first and foremost thing after buying a any vehicle is to do is it has to be registered in RTO office. Before assuring a number plate to the vehicle every vehicle attaches a RFID tag attached to wind screen of vehicle. The data of each and every vehicle is recorded in advance and the motorist assigning his bank account must maintain some minimum balance. So vehicle arriving nearby toll plaza not only scans the RFID tag and the if it is valid the amount is reduced, if not it blocks the vehicle. To achieve the processed information ,the system is being controlled by microcontroller. The operation processes on receiving signals from the controller to open or close the gate.

2. IMPLEMENTATION

The proposed method used here is GPRS technology is the better technology in embedded field. This system is used to provide a secured end to end development,

authorized and status update will be transmitted to the registered mobile number via SMS using GSM and also this data will be posted to web using GPRS technology. By using this system we can track the person as well as well as position of that person in the mobile and we can control toll booth accessing also.

3. SYSTEM DESIGN

This paper gives a clear vision of toll collection system. The first and foremost thing after buying a any vehicle is to do is it has to be registered in RTO office. Before assuring a number plate to the vehicle every vehicle attaches a RFID tag attached to wind screen of vehicle. The data of each and every vehicle is recorded in advance and the motorist assigning his bank account must maintain some minimum balance. So vehicle arriving nearby toll plaza not only scans the RFID tag and the if it is valid the amount is reduced, if not it blocks the vehicle. To achieve the processed information ,the system is being controlled by microcontroller. The operation processes on receiving signals from the controller to open or close the gate.

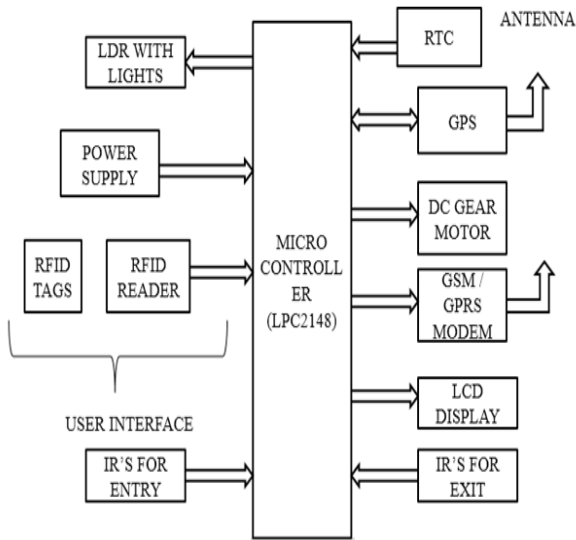


Fig.1.Block Diagram of Toll Collection System

4. METHODOLOGY

4.1 Microcontroller

LPC2148 is widely used IC from ARM7 family. In our project we are going to use such a microcontroller. In this paper to achieve the processed information the system is being controlled by the microcontroller. By receiving the signals from the microcontroller and sends the data to output devices i.e. LCD, motor driver.

4.2 Liquid-Crystal Display (LCD)

In this paper microcontroller sends the data so that LCD displays certain informative messages like valid card, invalid card, amount, vehicle number etc. LCD has 14 pins .we have been using 16x2 LCD 16 characters per each line of 2 lines.

4.3 RFID

In this paper RFID technology has maintaining its vital role. It does work on radio frequency waves. According to my knowledge it has diverse range of functions i.e. RFID attached to wind screen of vehicle scans transfers ID to microcontroller and let the vehicle to pass., used in libraries, attendance system etc.



Fig.2.RFID Reader

RFID tags are of two types and come in variety of sizes and shapes:

1. Active Tags
2. Passive Tags

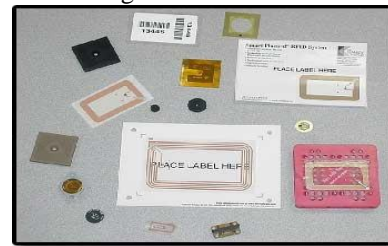


Fig.3. Different types of tags

4.4 DC Motor

With the above specifications having it, we are going to use DC motor to open and close the gate, motor driver to control the barriers. To drive the motor, we require 12 volts supply. In this paper the gate is opened when RFID scanning is done in a appropriate way it do. By receiving the signals from the controller the gate could be opened or closed.



Fig.4. DC Motor

4.5 GPS

Global Positioning System is a satellite-based navigation system. GPS also used in vehicles to apply location for vehicles. In this paper we provide a secured-end-to development, by using this system we can track the person as well as position of that person in mobile

and control the toll booth accessing.

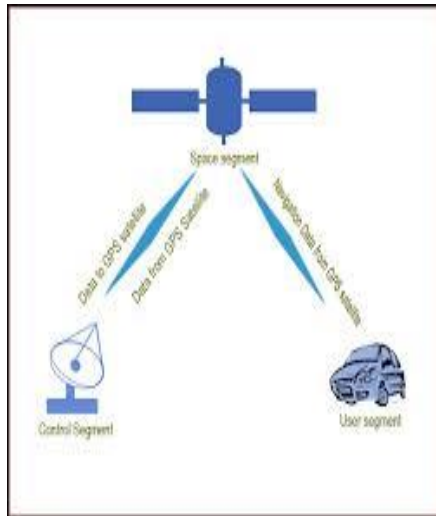


Fig.5. GPS Working

4.6 LDR

LDR has high resistance. It varies with wavelength of incident light. LDRs detect the presence or the level of light. IR rays from transmitters are reflected from the vehicle and received by receiver.



Fig.6.LDR

4.7 GPRS

This paper proposes a design using GPRS technology. With the advent of using this GPRS technology, the amount of data required can be transferred to mobile device over internet. GPRS technology is the better technology in embedded fields. In this paper, authorized and status update will transferred to registered mobile number via SMS and also this data will be posted to web using GPRS technology. The project provides an extra layer of security by using GPRS processed information and shared with the authorities. In remote places it is possible and the mobile phones enabling it double it as portable internet connections.



Fig.7. GPRS

5. RESULT

The mission is to collect toll tax at the national highways for the vehicles using GPRS technology that tries to provide security to track the person & the vehicle using GPS, the data will be automatically sent to the web server, when a proper connection is established with sever device.

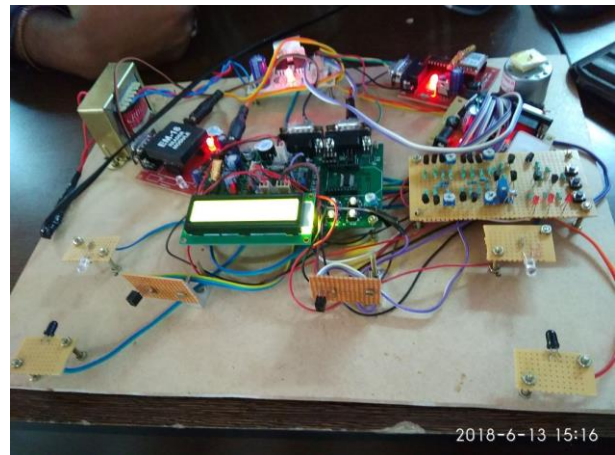


Fig.8. System design model of GPRS based toll collection system

5 CONCLUSION AND FUTURE SCOPE

Conclusion:

The project titled "ADVANCED SECURITY SYSTEM USING GPRS TECHNOLOGY AT RFID BASED TOLL GATE". The project is aimed at implementing a

secured feature, authorized and status updating will be transmitted to registered mobile via SMS using GSM and this data will be posted to web using GPRS technology. This is achieved with the help of GPRS and GSM technology. The project provides an extra layer of security by using this GPRS processed information and shared with authorities.

Future Scope:

- Implementation of image processing for centralizes data recording. Here we are using IR courting at the entry gate which is followed by camera which will continue sly capturing the images of vehicles entering the toll plaza.
- Automated control for toll collection powered by compound power generation from speed breakers and solar cells with GSM technology.

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