

# Automatic Ticket Issuing System For Conductorless Buses

K.R.Aravind., R.Arasu, Asick Ahamed.K., R.Rajakumari

**Abstract:** In our country, most of the people use buses for their transportation. During the peak hours, it is very difficult for issuing and getting tickets. Also the main problem is proving balance to the passenger by means of change. The probability of ticket fraud is also high. Moreover the passengers need to safeguard the ticket until they reach their destination. To overcome this type of difficulties the automatic ticket issuing system is proposed. In this work, a Radio-Frequency Identification (RFID) reader is used to read the tags. A keypad is assigned to get the number of co-passengers. An Infrared (IR) sensor is used to verify if the entered count is correct. Global Positioning System (GPS) system is used to track the distance traveled by the passengers and with the help of this information the ticket amount is deducted. Also accident detection can be done with the help of an accelerometer and the accident location is sent to the nearby hospitals by the help of GPS and GSM system. The RFID tag can be recharged.

**Index Terms :** Automatic ticket, Conductor less bus, RFID, Infrared sensor, GPS, GSM, Accident location detection.

## 1 INTRODUCTION

The rates of population and pollution are going high. Most of the citizens have their private vehicles resulting in higher rate of traffic jam and usage of fuels. This could be avoided by the usage of public transports. When it comes to public transport bus is more efficient because only bus could reach the nook and corner of the city. Generally the tickets are collected by the conductors in all the buses whether it is run by government or private. Conductor will be having a bunch of printed tickets in hand and after boarding a bus, the conductor will provide tickets according to the destination. The major drawbacks in the above systems are that the conductor must return the correct remaining balance to the passengers, which mostly results in chaos. Another drawback is that wastage of papers. Nowadays in some buses conductors uses handheld ticketing machine to issue ticket. Separate Ticket checkers are assigned to avoid ticket frauds during peak hours. In case of systems which uses RFID alone the destination must be entered before or separate tags are allocated for specific routes. Another way is issuing ticket at the start of the journey, but in this system is possible only in end to end buses.

## 2 EXSISTING SYSTEM

Conductor less Bus Ticketing System Using RFID and Accident Information through GPS and GSM was proposed by T. Manikandan , et.al.[1]. Prof.A.U.Deshmukh,et.al., proposed Conductor less bus using Image processing [2]. The face of the passenger is captured by the camera and matched it with the database. If it was matched, the fair is automatically deducted from their account, otherwise they must carry RFID card with them to pay the fare. An innovative idea to automate the fare collection system for public transport using GPS and smart card which reduces the calculation of bus fare and man power was introduced by Arun Das.S.V and K. Lingeswaran . Bus tracking and ticketing system based on mobile which was implemented using Android system was proposed by Suresh Sankarananrayanan and Paul Hamilton [5]. In order to achieve smart ticketing system in bus, RFID and GPS system are mainly used. The required information about the passenger and the balance can be known from the RFID tags. A RFID reader is used to read the tags. Microcontrollers are used to validate the tags. A LCD display is used to display the information to the passengers. In case of an accident the

accelerometer is used to indicate it. With the help of a GPS module and GSM system the location in which the accident took place is identified and the information is sent to the nearby hospital.

## 3 PROPOSED SYSTEM

RFID (Radio Frequency Identification) system as a whole consists of tags and reader. RFID tags are issued to the passengers. The tag consists of the personnel information about the passengers. Each bus consists of a RFID reader, this reader is used to read the RFID tag. After reading the tag the information present in the tag is sent to microcontroller. Then the information like balance are verified, if the tag is a valid one, further details like number of co-passengers is displayed to passengers through LCD. The number of co-passengers is entered with a help of a keypad. This system consists of a GPS system which is used to store the location of the passengers' entry location. The MCU then sends information to the motor driver of the bus door and the bus door is opened. An IR sensor is used to verify if the number of passengers entered manually and the number of passengers entered into the bus is same. If the count is not correct an alarm alert is given. When the passengers need to get down, again the tag is to be read. The distance travelled by the passengers is calculated by the use of the GPS system i.e. from the entry location and the destination location. The count of the co-passengers is also taken and the fare amount is detected from the total balance amount while getting out of the bus. While passengers getting down the IR transmitter and receiver is used to take the count of passengers getting down. An accelerometer sensor is used to detect accidents if occurred and information is sent to the hospital through GSM module.The location of the nearby hospital could be found using the GPS module.

## 4 BLOCK DIAGRAM

Fig1 shows the block diagram of the proposed system.

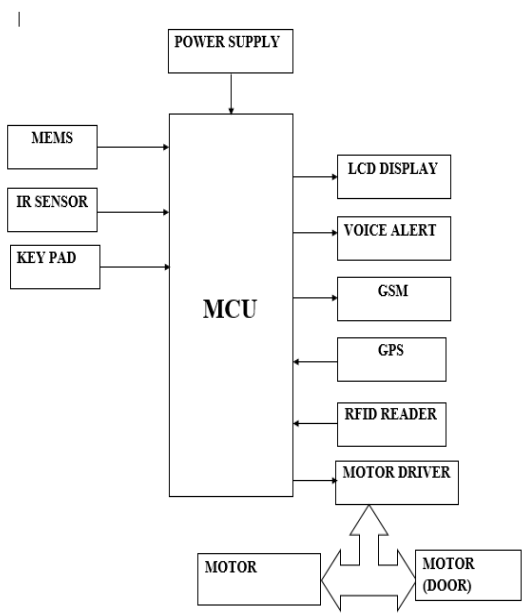


Fig1. System Block Diagram



Fig2. System Block Diagram

**5.2 LCD DISPLAY**

Liquid Crystal Display screen as shown in Fig3, acts as an output source for displaying the information. It acts as an interface between the user and the microcontroller.

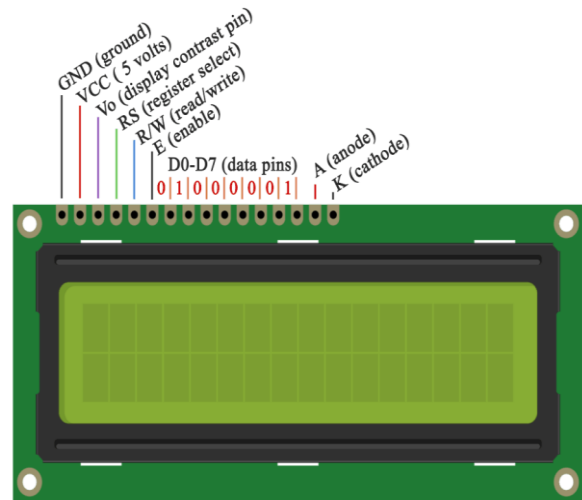


Fig3. Liquid Crystal Display

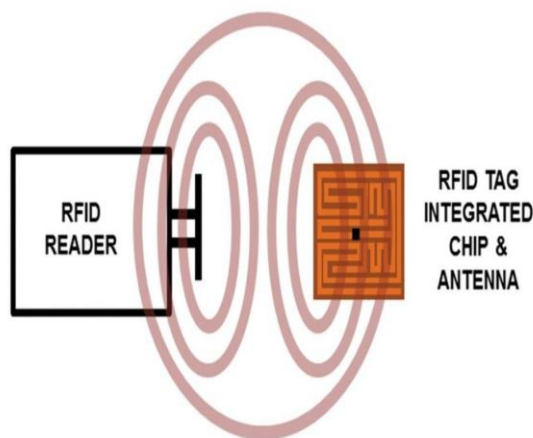
**5 HARDWARE REQUIRED**

To implement the proposed system, the following components are needed.

1. RFID
2. LCD Display
3. IR Sensor
4. MCU
5. GPS
6. GSM
7. MEMS
8. Key Pad
9. Implementation setup

**5.1 RFID**

The system has a RFID reader and the RFID tags are issued to the passengers as shown in Fig2. The RFID tags consists of the information about the passengers stored in it. The tag also contains the information about the balance. These tags can be recharged. The RFID reader is used to read the information stored in the RFID tag.



**5.3 IR Sensor**

The IR sensor consists of a transmitter and a receiver. The infrared transmitter is a light emitting diode. This light emitting diode (LED) emits infrared radiations. These infrared radiations are detected by an infrared sensor as shown in Fig4. So when there is a human movement the change is detected by this sensor and the number is calculated with the help of a counter.

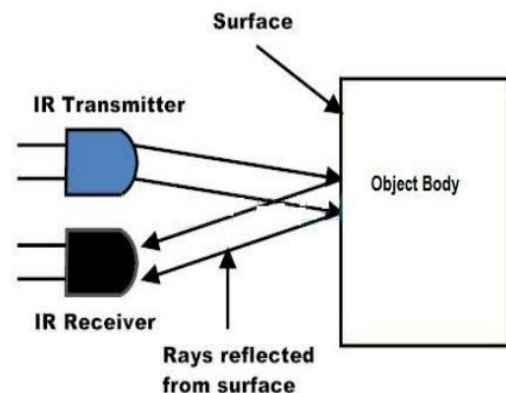


Fig4. Infrared sensor

#### 5.4 MCU

Fig5 shows the Micro Controller Unit which acts as the heart of this system. This is used to interconnect different types of electrical components together. MCU plays a major role in receiving the information, processing and sending information to the corresponding component to perform that specific action.



**Fig5.** Micro Controller Unit

#### 5.5 GPS

Global Positioning System (GPS) which is shown in Fig6, plays a major role in the bus fare calculation system. This system stores the location when a passenger boards a bus. When a passenger gets down at a bus stop, the location of the bus stop is taken by this system. And the fare is calculated by the distance between the initial and the final places. And this amount is automatically detected from the main balance. During the case of any accident this system helps in finding the location of the nearby hospitals



**Fig6:** Global Positioning System

#### 5.6 GSM

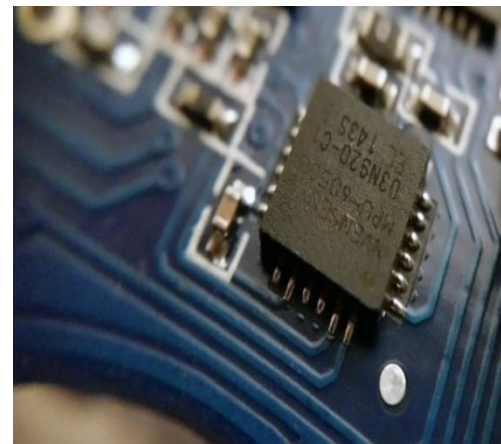
Global System for Mobile communication (GSM) as shown in Fig.7 is one of the most widely used telecommunication. If the bus met with an accident then this system sends the location of the bus to the nearby hospital



**Fig7:** Global System for mobile Communication

#### 5.7 MEMS

Micro-Electro-Mechanical Systems accelerometer sensor as shown in Fig8 is used to detect if accident occurred. During accidents the vibrations occurred are measured by the accelerometer.



**Fig8:** Micro Electro Mechanical System

#### 5.8 Keypad

Fig9 shows the keypad which is used to enter the number of co-passengers. With the use of the keypad multiple passengers can be entered and travel with one RFID tag.



**Fig9: Keypad**

### 5.9 Implementation setup

To implement the proposed system, the above said components are used and assembled. The setup model is shown in Fig10.



**Fig10: Implementation setup**

## 6 CONCLUSION

This system overcomes the difficulties of the passengers. This system is safer because it sends the location of the bus during the time of accident to the nearby hospital. Ticket fraud can be avoided. This system can be further developed by replacing debit card in the place of a RFID tag

## REFERENCES

- [1] T. Manikandan, G. Kalaiyarasi, P K. Priyadarshini, P R.Priyanga," Conductor less Bus Ticketing System Using RFID and Accident Information through GPS and GSM", IJISSET - International Journal of Innovative Science, Engineering & Technology, Vol. 2 Issue 9, September 2015.
- [2] Prof. A. U. Deshmukh1 Priyanka Kokil Dhanashri Khadtar Bhagyashri Khadtar," Conductor Less Bus using Image Processing", IJSRD - International Journal for Scientific Research & Development| Vol. 4, Issue 02, 2016.
- [3] Ciripireddi Durgaprasad, G. Rajesh, "Automatic Fare Collection System in Public Transportation", International Journal of Scientific Engineering and Technology Research, Vol.05, Issue.47 December-2016.
- [4] Arun Das .S .V, K. Lingeswaran, "GPS Based Automated Public Transport Fare Collection Systems Based On Distance Travelled By Passenger Using Smart Card", International Journal of Scientific Engineering and Research, Volume 2 Issue 3, March 2014.

- [5] Suresh Sankaranarayanan, Paul Hamilton," Mobile Enabled Bus Tracking and Ticketing System", International Conference on Information and Communication Technology, 2014.
- [6] Paul Hamilton and Suresh Sankaranarayanan, "Intelligent Agent Based RFID System for on Demand Bus Scheduling and Ticketing", International Journal of Future Computer and Communication, Vol. 2, No. 5, October 2013
- [7] Dr. Bose Mathew Jos1 , Ahammed Aslam N2 , Akhil.E.P.3, Divyalakshmi G4, Shajla C5, "RFID BASED BUS TICKETING SYSTEM" , ISSN:2320-3765, IJAREEIE, VOL 4, ISSUE 4 , April 2015.
- [8] Mohit Agarval , Manish Sharama2 , Bhupendra Sing3, Shantanu4, "Smart Ration Card RFID and GSM technique", 2014 5th International Conference.
- [9] R. Ramani1 , S. Selvaraju2 , S. Valarmathy3 , P. Niranjan4 , "Bank Locker Security System Based on RFID and GSM Technique", International Journal of Computer Applications.
- [10] International Journal of Innovative Science, Engineering and Technology on "Conductor less Bus Ticketing system Using RFID and Accident Information Through GPS and GSM".
- [11] Maria GraziaGnoni, et al, 2009 "A Smart Model for Urban Ticketing Based on RFID Applications", IEEM09-P-0572, IEEE.
- [12] Prof. Shilpa Khedkar1 , Praphull Powar2 , Pratik Gurdhalkar3 , Saurabh Karbhajan4 ,"A review on Smart Bus Pass using RFID Card System for Regular Bus Passengers", ISSN:2320-9798, IJIRCCE, Volume 4, Issue 11, November 16.
- [13] A.R. Kittur1, P.C. Bhaskar 2, "Simple and efficient method of Image Acquisition using Internet for Real Time Application", ISSN 2319-7064, IISR, Volume 2, Issue 4, April 2013.