

# RFID Based System for School Children Attendance Bus Transportation Safety Enhancement Using ZIGBEE

<sup>[1]</sup> K Saipriya <sup>[2]</sup> D Madhu

<sup>[1]</sup> PG Student <sup>[2]</sup> Associate Professor

<sup>[1][2]</sup> Department of ECE, Siddharth Institute of Engineering & Technology, Puttur, A.P., India

---

**Abstract:** - A system to monitor pick-up/drop-down of school children to enhance the safety of children during the daily transportation from and to school. The aim of this project is to implement the RFID based for school children attendance transportation safety enhancement. The purpose of this project is to provide safety of children's during the daily transportation from and to school. The advanced system makes good use of new technology that is based on arm7, RFID and ZIGBEE technology. The system consisting of two units, a bus unit and school unit. The bus unit acts as a transmitter and school unit acts as a receiver. These two units communicate by using ZIGBEE. The bus unit is used to detect when a children enter or leave the bus and display on the LCD. The information is send to the school unit. That unit identifies whether the children enter or leave from the bus and send an alert message accordingly. The school unit which receive the information about children to authorised persons by using GSM technology. In this project we proposed the system is promising for daily transportation safety.

**Keywords:** ---ZIGBEE, RFID, GSM, Safety enhancement

---

## I. INTRODUCTION

Presently a day's numerous schools far from the urban communities. Child's wellbeing is greatest significance to their parents. In spite of the best safety measures, kids, because of their absence of aptitudes to ensure themselves, may wind up in a circumstance that imperils their life. (E.g. crossing the street without paying consideration on traffic). To keep up bus transportation consummately administration for the most part names bus chief to check whether the all students are enter or leave the bus. It is to some degree hard to keep up furthermore tedious.

This project presents the most related work to the issue, a system is proposed to track the children utilizing bus module that transmits following data to a school module and a cell phone. So school administration can actualize this proposed system for simple keep up. In this project present a system to screen the everyday bus get and drop-off of children's to enhance the general security of the day by day bus transportation to/from school, we concentrate on a specific danger connected with the bus trip transport outing to and from school.

The project objectives at consequently identifying when a children's loads up or leave the bus and issue a ready

message when a children's does not loads up or leaves the transport to diminish the parents reasons for alarm about utilizing the transport for the everyday transport of their children's` without being missing, which has extended essentially recently. This has regularly prompted the demise of many students by virtue of suffocation because of the absence of attention of inferred. This anticipate through section and leave recording, objectives to make an appropriate environment by taking after certain arrangement of security and wellbeing for school bus that will positively affect the student and their family. A bus security system which was considered to control the entering/existing of students from the bus.

## II. PROPOSED SYSTEM

The proposed system is based on the ZIGBEE and RFID technology. The system is divided into two units: bus unit located inside the school bus and a school unit located inside the school. The bus unit is responsible for detecting the child when he boards or leaves the bus and then this information is send to the school unit, by using GSM we can send the alert message to their parents. The proposed system architecture as show in figure.



**Fig1: The proposed system Architecture**

**The bus unit:**

The bus unit will identify the children when they board/ leave the bus, it will use RFID technology to reach this purpose. This technology consists of RFID readers and tags.

The RFID reader will be located inside the school by the entrance. It will be positioned where it will only detect the children when they are inside the bus. But if child was outside near the bus, the reader will not detect him. Each child will wear a card with RFID tag attached to it. The bus unit is responsible for sending relevant tag information to the school unit where it will be stored and processed.

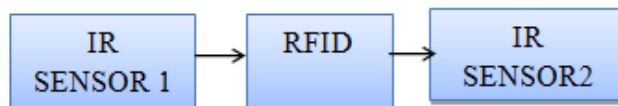
**School unit:**

School unit involve of 8051 micro controller interfaced with GSM modem to receive data from the bus unit. Both the transmitter section and receiver section can communicate by using ZIGBEE, the received data can also display on the LCD. Thus the displayed information can be sending to their parents about children's bus transportation and their pickup and dropdown by school unit.

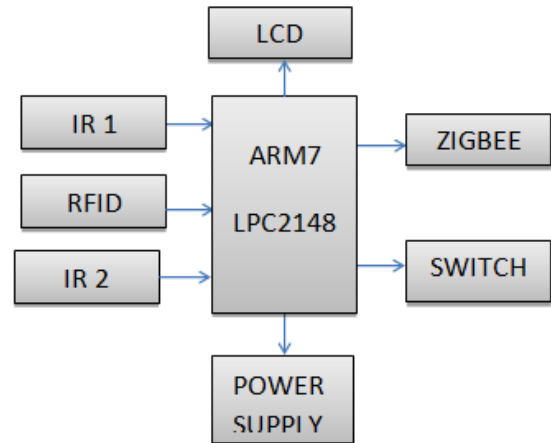
**A) Block Diagram of Transmitter:**

The transmitter section is consists of ARM 7 and IR sensors RFID reader, switch, LCD and ZIGBEE technology.

**Operation of IR and RFID:**



**Fig 2.1: operation of IR and RFID**

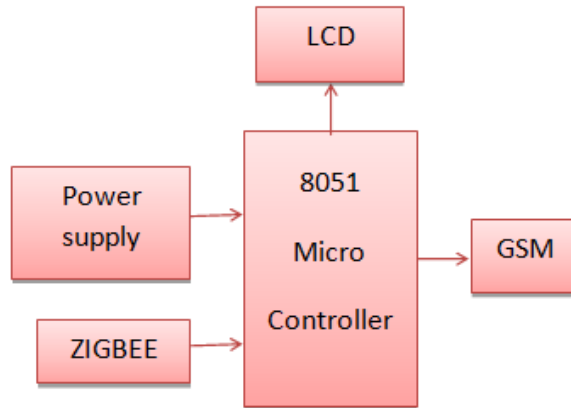


**Fig 2.2: Block diagram of Transmitter**

The transmitter section is consists of ARM 7 and IR sensors RFID reader, switch, LCD and ZIGBEE technology. This section mainly used for checking whether the children boards or leaves the bus. When the student enters through IR1 (IR2 vice versa) sensor then RFID reader reads the card and the transmitter section can read the children's information. This information can be displayed LCD and at the same time the information can be send to the receiver section by using ZIGBEE through ARM 7 micro controller. The power supply given to the development board which gives +5V and consists of regulator, power supply.

**B) Block diagram of Receiver:**

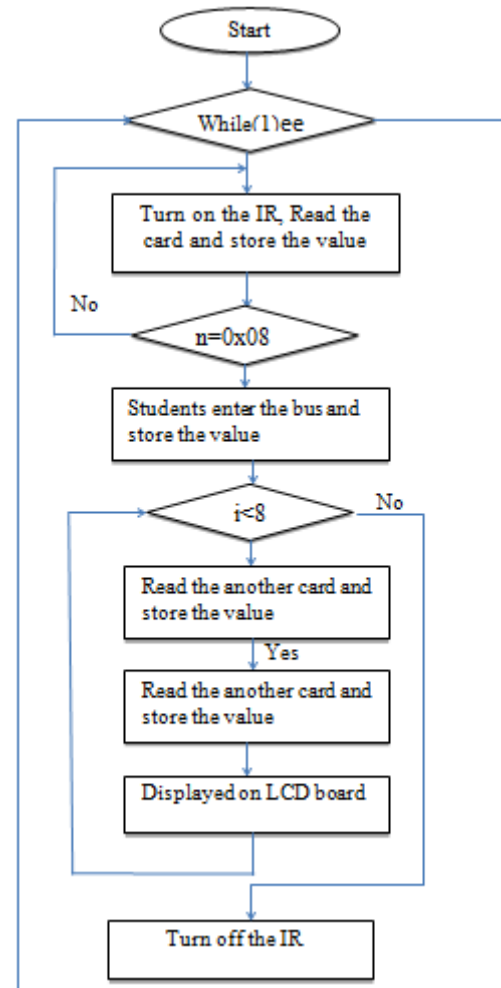
The receiver section consists of 8051 microcontroller, LCD, ZIGBEE, GSM and power supply.



**Fig 2.3: Block diagram of Receiver**

The receiver section acts as a school unit. The receiver section consists of 8051 microcontroller, LCD, ZIGBEE, GSM and power supply. The receiver section function is to receive the particular student information from the transmitting ZIGBEE. The total information will be displayed on LCD board and message will be send to the parent's mobiles through GSM modem. The project involves both hardware and software. This project used to two microcontrollers LPC2148 and 8051. The Microcontrollers are heart of the project where it is used to control the whole system, with the help of wireless technology. We can generate the children's information passes school unit and at the same information send to the parent mobile through GSM module. This information sends only to the authorizer user. With help of GSM technology information send to the user mobile. The received information displayed on LCD board. This entire operation will controls by ARM 7 and 8051 microcontrollers.

**C) Flow chart:**



**Fig 2.4: Flow chart of code used to read tag number**

### III. APPLICATION & ADVANTAGES

**Advantages:**

- This school management can provide safety and secure for bus.
- Parents can also know about their children's information during transportation.
- The deployment cost is reasonable.
- The system is automatic and user friendly.

**Applications:**

For safety and secure transportation in

- Educational institution.
- Daily transportation.

**IV. RESULTS**

**Transmitter:**

The power supply 5V is applied to the transmitter. The ZIGBEE module pins of TXD and RXD are connected to the P0.8 and P0.9 of ARM micro controller is as shown in figure 4.1. The transmitter section acts as a bus unit.



*Fig 4.1 Kit diagram of transmitter*

**Receiver:**

The receiver section consists of 5V power supply. The ZIGBEE and GSM modules pins are connected to the P3.6 and P3.7 of 8051 micro controller as shown in figure 4.2. The receiver section acts as a school unit.



*Fig 4.2: Kit diagram of receive*



*Figure 4.3: student enter the bus*



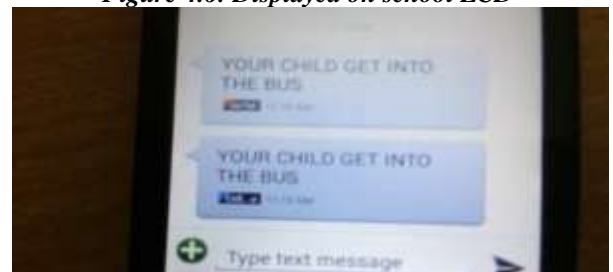
*Figure 4.4: student show the RFID card in bus*



*Figure 4.5: Bus begins to move*



*Figure 4.6: Displayed on school LCD*



*Figure 4.7: Send to children parents*



*Figure 4.9: Bus is stopped*



*Figure 4.10: Displayed on school LCD*

## V. CONCLUSION AND FUTURESCOPE

### CONCLUSION

The RFID and ZIGBEE are emergent technology which is used in wide range of applications. This project generates effective solution called safety and secure by integrating both RFID and ZIGBEE. This system has given the reliable and low cost results when compare with other related existing technologies of this system is very easy because there is no much hard ware and software complexity.

### FUTURE SCOPE

- The design can be made more enhanced in future support by using of IOT.
- While Implementing of IOT in this project, sensors, GPS, GPRS, and ZIGBEE all are should be taken in a simplest way to monitoring the status of school children safety.

## VI. ACKNOWLEDGEMENT

We would like to thank our mentor Prof. D. Madhu for guidance and help throughout our project. We are also thank full to our institute Siddharth institute of engineering

& technology, puttur, for providing all the facilities needed for our project.

## VII. REFERENCE

1. AnwaarAl-Lawati, Medhat Awadalla and Dawood. "Web design based student attendance system using RFID technology" in sultanQaboos University in 2015.
2. US. Department of home land security, "additional guidance and security controls are needed over the systems using RFID and DHS", department of home land security OGI-06-53 (office of general inspector).
3. US. Government accountability office, "International security: radio Frequency Identification technology in the Federal Government" (2005)
4. International Organization for standardization (ISO), (2003). Identification cards- Contactless integrated circuit card—vicinity cards. ISO/IEC 14443.
5. Kassim.M and S.Yahya. A case study "Reliability of smartcard applications and implementation in university environment" Malaysia, in 2009.
6. Murizah kassim, Norliza Zaini, Muhammad Khidhir Salleh. "Web based student attendance system using RFID technology" in 2012 IEEE control and system Graduate Research colloquium.
7. Selim Guvercin. "Attendance control system based on RFID technology" in 2012 IEEE international journal of computer science issues.
8. GSM User Manual, SIMCOM LTD, August 2006.
9. M.M.Ollivier. "RFID a new solution technology for security problems". European Convention on Security and Detection May 1995.
10. A. Viklind, "Experience from an application for safe transport to and from school: a step toward SAFEWAY2SCHOOL," International Conference on Telecommunications, 2011.

11. MadhuManikya Kumar, K. Rajesekhar, K. Pavani, "Design of punctually enhanced bus transportation system using GSM and Zigbee," International Journal of Research in Computer and Communication Technology, Vol. 2, Issue 12, December 2013.

12. R. Anil Kumar, G. Jyothimai, K. Rameshbabu, "Design and development of ARM based embedded intelligent public transport vehicle position system," International Journal of Internet Computing, Vol-1, Issue 3, 2012.

13. Ben AmmarHaten, Haman Habib, "Bus management system using RFID in WSN," European and Mediterranean Conference on Information System, 2010.

14. Mahammad Abdul Hannan, Aishah Mustapha, AiniHussain, "RFID and communication technologies for an intelligent bus monitoring and management system," Turkish Journal of Electrical Engineering and Computer Science, pp: 106-120, 2012.

#### VIII. ABOUT AUTHORS



K.Saipriya completed her B tech degree in electronics and communication engineering & technology from SKR College of engineering and technology. Presently she is persuing her Master degree in embedded system of Electronics &Communication Engineering siddharth Institute of Engineering & Technology, puttur from 2014-2016. She is currently working on a project titled "RFID BASED SYSTEM FOR SCHOOL CHILDREN ATTENDANCE BUS TRANSPORTATION SAFETY ENHANCEMENT USING ZIGBEE" as a partial fulfilment of her M. Tech degree.



D.Madhu received the B.Tech degree in Electronics and Instrumentation Engineering from Jawaharlal Nehru Technological University in 2008 and M.Tech degree from S.V University

Tirupati, currently working as Assistant professor in the Department of ECE, Siddharth institute of engineering & technology, puttur, AP.