

TITLE: SCHOOL BUS ATTENDANCE AND MONITORING SYSTEM USING RFID

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ABSTRACT

Security systems and navigators have always been a necessity of human's life. Millions of children need to travel between homes to school every day. Safer transportation of school children has been a critical issue as it is often observed that, kids find themselves locked in the school bus after going to school, they miss the bus, or ride.

This project intends to find yet another solution to solve this problem by developing a bus safety system that will control the entry and exit of students from the buses through an efficient methodology.

The proposed system will control the entry and exit of students to and from the bus using RFID (Radio Frequency Identification) and GSM technologies to ensure the entering and exiting of all students to and from the school bus in a safer manner.

The process does not require any additional process to be done by the students and drivers. The system will do all the process and allow the student to be tracked while entering and leaving the bus. If the bus journey is successful from the source to destination, it will send an SMS to the management to inform its departure and arrival.

By using RFID technology other applications such as locate access control, location tracking, billing easily and other applications. RFID tags are expected to multiply into the billions over the coming few years.

Keyword: - PIC microcontroller, RFID Reader, RFID tags, GSM module, LCD.

1. Introduction

The project is based on RFID system. This system is used to track the attendance of the students in the school bus. In today's generation children lack in skill to protect themselves, so it is our responsibility as a person to safe guard children and to teach them the skills to be safe. Today most of the students are travelling to school by school buses or vans. Parents think that their kids are safe when they travel by school bus. But are they really safe? There are many common problems such as students getting kidnapped out of school, bus getting delayed in traffic etc. so we can't exactly say that they are safe with bus. So now it's possible to track the bus, find out whether they are in trouble or why they are late by school bus tracking project. By enhancing this project we can make additional services to the society like daily traffic analysis the bus can send through the most suitable route which will help to reduce traffic in urban area.

1.1 Overview of the system

The Microcontroller acts as a Data Acquisition System for the module. The microcontroller will collect the data from RFID card to RFID Reader and process it further for required operations. Each student will be provided with a RFID card containing his/her related necessary information. As soon as the student checks in the bus, the student will have to punch the card at the time of boarding of the bus. The respective information will be displayed on LCD and stored to tally for check out. At the time of returning from the school, if the tally of the students entered the bus does not match with the previous tally at the time of check in , then the driver of the bus will be alarmed and a SMS will be send to the parents through GSM Module.

1.2 Literature Review

A literature review has showed there are many studies made use of Radio Frequency identification (RFID) as a system that transmits the identity of an object using radio waves by Kumar [1]. This identity is transmitted in a form of serial number that distinguishes each object from others. The RFID system consists of an RFID reader and a RFID tag. The tag consists of the microchip that is connected to an antenna; microchip can store a maximum of 2 KB of data, which may include data and information about the product, manufacturing date, and destination further, the author also observed that the ability of the reader field decreases quickly with increasing distance, which defines the area of reading to 4-5 meter distance using VHF 860-930 MHz. Another research Ben &Abdullah [2] introduced a system that monitors children inside the bus in a safe manner. It uses a combination of RFID, GPS (Global Positioning System), and GPRS (General Packet Radio Service) technologies. Each student carries a unique RFID card. The card is embedded in each of the student's school bags. Whenever a student enters or exits from the bus, the reader records the time, date, and location and then transfer the data into a secure database and this does not require any action from the drivers and students. According to [3] Bichlin Hoang Radio Frequency Identification (RFID) has been used in a number of practical applications, such as improving supply chain management, tracking household pets, accessing office buildings etc. RFID is used to automatically identify people, objects, and animals using short range radio technology to communicate digital information between a stationary location (reader) and [4] Asaad M. J. proposed to communicate between the server and the user present at the remote location, various systems can be used such as zigbee, Bluetooth, etc. But among all of them, GSM system is found to be most useful due to its range and efficiency as nowadays everyone is having a cell phone [2].

2. Technical Approach

The hardware of the system contains a PIC microcontroller, RFID module, GSM module and LCD. The actual hardware is as shown in the picture below.



Fig -1: Hardware

2.1 System Architecture

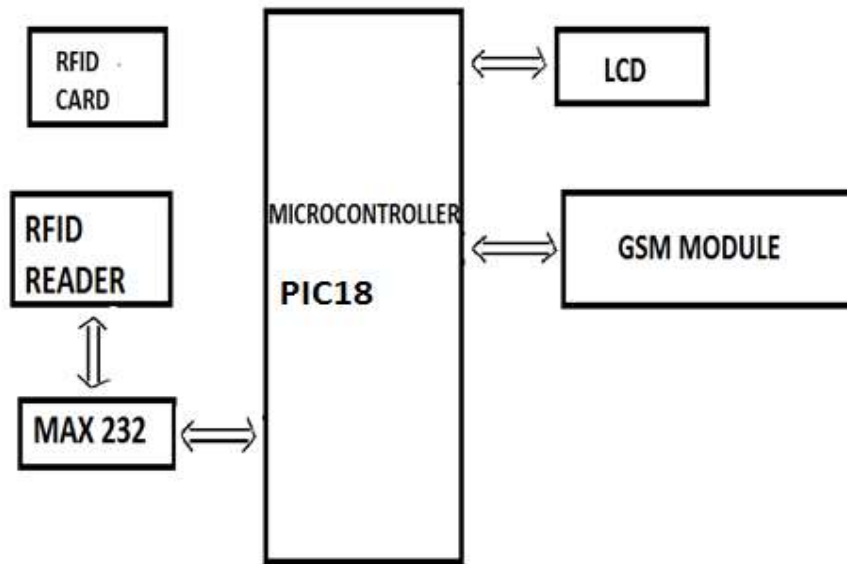
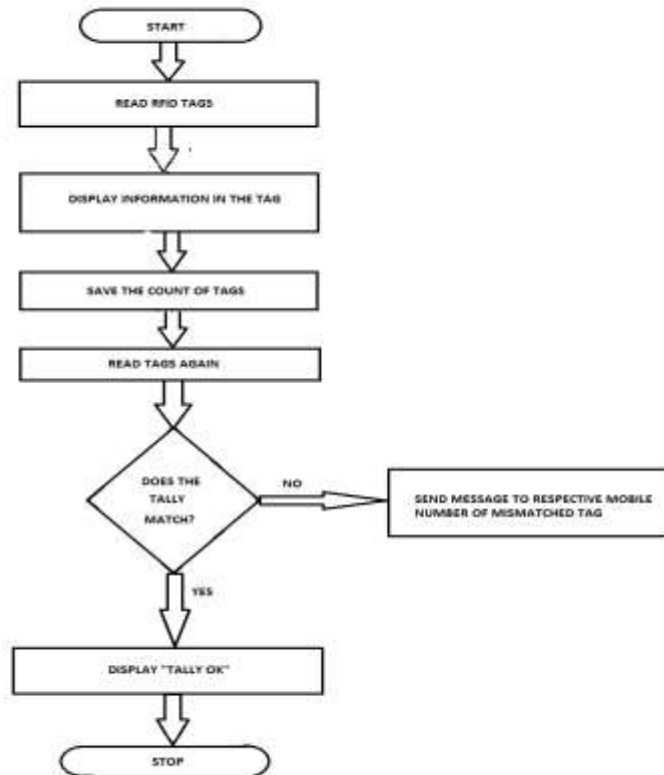


Fig-2 Blok Diagram

2.2 Flowchart



2.3 Simulation

The simulation is done on the proteus software as shown in the following figure.

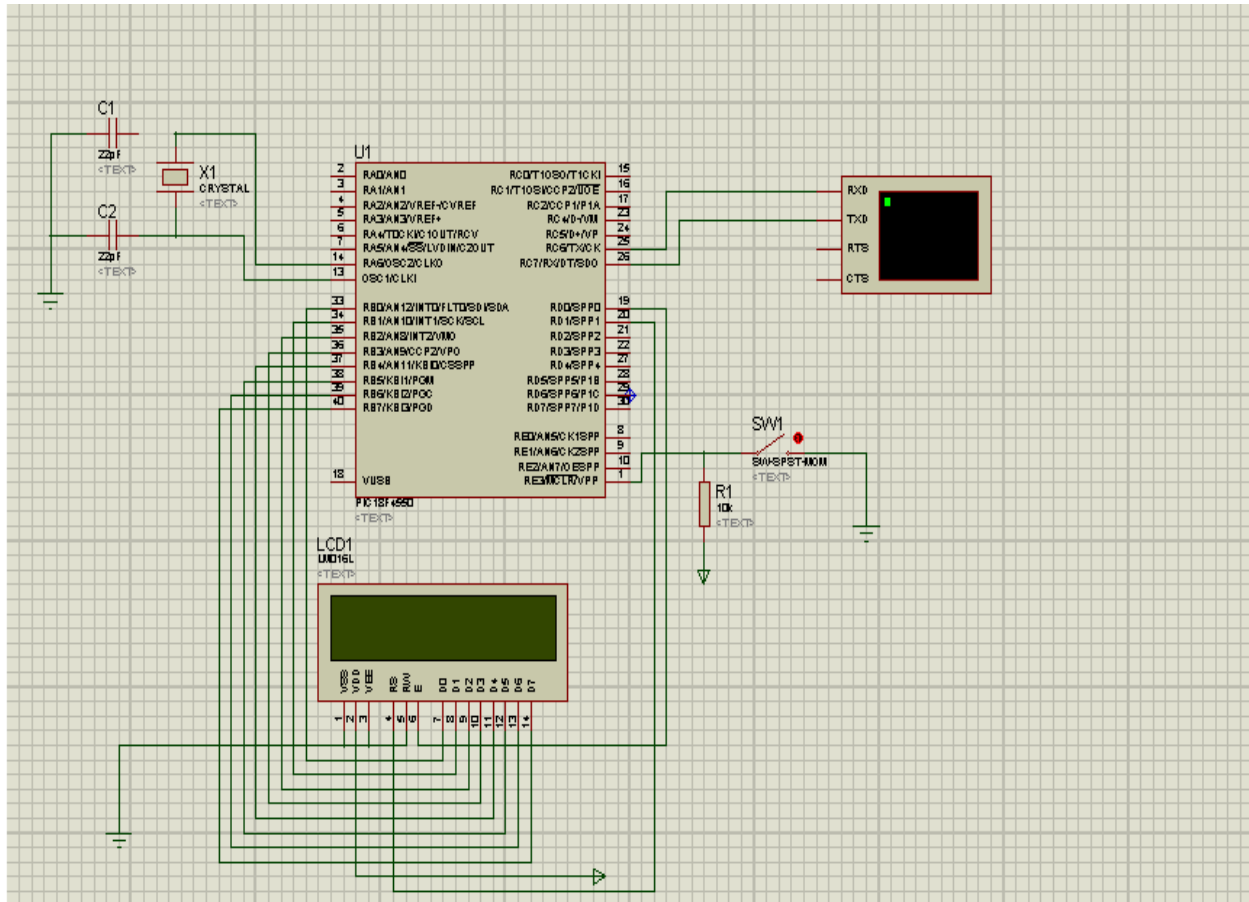


Fig-3 Simulation

3. Specifications

3.1 RFID module

Radio-frequency identification (RFID) is the use of a wireless non-contact system that uses radiofrequency electromagnetic fields to transfer data from a RF transmitter attached to a vehicle (ambulance), for the purposes of automatic identification and tracking. These devices use a power source (9V) and emit radio waves (electromagnetic radiation at radio frequencies). The transmitter sends signal to the receiver which can receive from several meters (yards) away. RFID (Radio Frequency Identification) is a technology that uses electromagnetic fields to identify objects in a contactless way; it is also called proximity identification. There are 2 elements in RFID communications: the RFID module (or reader/writer device) and an RFID card (or tag). The RFID module acts as the master and the card acts as the slave; this means the module queries the card and sends instructions to it. In a normal RFID communication, the RFID module is fixed and the user takes his card near it when he needs to start the interaction. An RFID card can be understood as a remote storage unit where we can read and write information without contact. Most of the RFID tags are passive, which implies that the RFID module must create an electromagnetic field in order to power the tag. The RFID card's antenna (in fact it is an inductive coupler) gets the power from this field. Also, an RFID card has a very basic micro-controller which manages the communications and memory access. Many RFID standards have been released by the industry. Most of them have as operating

frequency 125 KHz or 13.56 MHz. Besides, the module for 13.56 MHz is compliant with the Near Field Communication (NFC) technology; for more information read chapter. In the present document we will be explaining the RFID module which works at 125 KHz, and any reference to RFID must be understood as RFID for 125 KHz.



Fig-4 RFID Module

3.2 LCD

LCD is an electronic display module. A 16x2 LCD display module displays 8 bit. It contains 8 data pins along with 3 control pins. One ground two power pins are also there. D0-D7 used to send information to the LCD.



Fig-5 LCD Display

3.3 GSM

The SIM 900 is a compatible Quad - band cell phone, which works on a frequency 850/900/1800/1900 MHZ and which can be used not only to access the internet, but also for oral communication (provided that it is connected to a microphone and a small loud speaker) and for SMSs. GSM solution in a SMT module which can be embedded in the application. It is an ultra-compact and reliable wireless module.



Fig-6 GSM Module

4. CONCLUSION

The system keeps track of the students on board the school bus and gives notification about absent students through SMS using GSM.

5. REFERENCES

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