



RFID Based E-Attendance System & Child Security System

Manoj Awakhare¹, Nikhil Parmal², Swati Dhawale³, Priyanka Dongre⁴, Sachin Jamgade⁵, Akash Tambe⁶, Swarnmala Deulkar⁷, Bhagyashri Meshram⁸

Assistant Professor¹, BE Student^{2, 3, 4, 5, 6, 7, 8}

Department of Electronics and Telecommunication Engineering
Nagpur Institute of Technology, Mahurzari, Nagpur, India

Abstract:

In school, student irregular attendance is major issues which can affect on his academic performance, taking attendance in conventional way like by calling roll number or by signing on paper is very tedious and time consuming. On other hand when child leaves home for school parents get worried whether the child reached at school or not. RFID based E- attendance and child security system can be used as solution to both problem. RFID radio frequency identification secure system which uses electromagnetic waves to identify the object carrying tag. This system will reduce the time of taking attendance and anxiety of parent. It automates the attendance system by checking attendance using RFID cards as well as informs parents when student enters and leaves the school premises. In this system the student is provided with the RFID tag when student scans a card on the RFID reader the system recognizes the student data and compare with database and display authorized or unauthorized entry on LCD screen and also sends an SMS notification to the parent. The whole system is controlled by Arduino UNO. The parents call log into the system website and check the status of their children.

Keywords: RFID (Radio Frequency Identification), Arduino, Students Attendance

I. INTRODUCTION

Nowadays, Student's truancy is the biggest problem in every school, which may badly affects on their academics. Roll call in school consumes consider amount of time and resources. The teacher maintain attendance records by manually calling out roll number and names of each student at start of the day or after the lunch hour which may lead problem like proxy attendance and this system is time consuming also. In today's lifestyle, due to busy schedule of parents, they don't have time to pick and drop their child from school. But they always worried about him, because there are maximum chances of kidnapping and child trafficking. This project is an approach for this kind of problems. This system consists of RFID reader and tag. The RFID reader consists of receiver/transmitter antenna, buffer, register and UART. The reader coil generates an electromagnetic field, which couples into the coil on the RFID tag. Tag contains chip antenna which acts as transmitter. The field generates a current in the tag (transponder), which powers it, and also contain the transmitted the data. RFID tag serve as a unique identification card for each student. A student places his identification card in the proximity of RFID reader. The reader will read the data of a particular tag, which is being registered in Database. If data matches with the database, it will print student information on LCD screen. Otherwise it will show unauthorized entry. The system will send the notification SMS to the parent with the help of SMS gateway which consist of transactional SMS and Widely used in almost all industrial sectors (aero-space, automotive, logistics, transport, health etc). ISO (International Standard Organization) took part in establishing technical and adaptive standards that let to have a high degree of interchangeability. The frequency ranges of RFID vary with

promotional SMS. Thus the parents are alerted when student enters or exits the premises. Parent can also log into the system website to check the status of their child. The system needs a controller to manage this process. So ARDUINO UNO is chosen as platform. ARDUINO has everything that needs to a controller. It has its own inbuilt programmer. The ARDUINO software contains libraries for all components. The C/C++ or embedded C language can be use to write the program. The RFID reader is interfaced with the arduino which constantly checks the reader for any id scanned. Whenever a card is scanned, the system provides the signal with a card id to the microcontroller. In proposed system Ethernet shield is used which allows the arduino to access the internet.

II. ABOUT RFID TECHNOLOGY

In 1940 RFID was first used during World War II to identify aero-planes. The objective was to use the aero-plane's radar signal to read an identification number to identify whether they were allies or enemies. During 1960-70s RFID system were still considered a secret technology used by the army to control access into sensitive areas (nuclear plants etc.) In 1980 technological developments leads to the creation of passive tags. This technology meant we no longer needed the energy to be embedded into the tag. Therefore the price of the tag and its maintenance could be significantly reduced. In 1990 standardization for the interoperability of RFID equipment began. From 2005 RFID technologies are now country. India adopts 865-867 MHz for RFID. Regulators in India recently designated 865-867 MHz as country's UHF RFID spectrum, in line with the frequencies used by the United States and Europe. Commonly used RFID frequencies are: RFID LF (125kHz and 134.2 kHz), RFID HF (136.56 MHz)

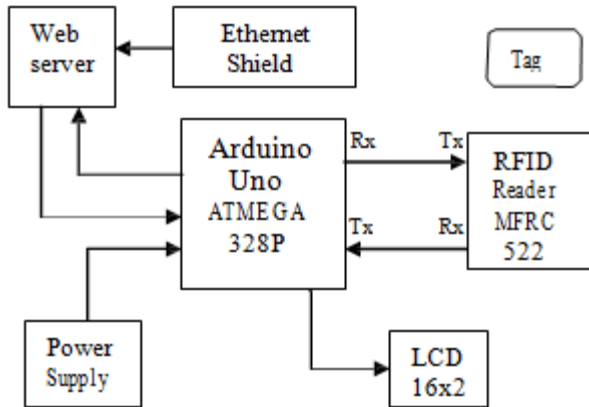
and RFID UHF (860-960 MHz).

SYSTEM DESIGN

The proposed system is designed by using following modules:

1. Arduino UNO microcontroller
2. RFID reader
3. RFID tags
4. LCD
5. Buzzer.

III. BLOCK DIAGRAM OF SYSTEM:



1. Arduino UNO Microcontroller

Arduino is an open source electronics platform based on easy – to-use hardware and software. Arduino boards are able to read inputs – light on a sensor, a finger on a button, or a Twitter message – and turn it into an output –activating a motor, turning on a LED, publishing something online. Arduino is high performance Atmel Pico power 8-bit AVR RISC based microcontroller. It has 32KB ISP flash memory with read-while-write capabilities, 1KB EEPROM, 2KB RAM and 23 general purpose input –output lines , 32 general purpose working registers, three flexible timer/counters with compare modes, serial programmable USART ,SPI serial port and 6 channel 10 bit A/D convertor. This controller operates between 1.8V-5.5V. This controller interfaced with RFID reader, buzzer and LCD.

2. RFID reader:

A radio frequency identification reader is a device used to gather information from an RFID tag. It also called as Proximity Coupling device and read the data at certain frequency. A single reader can read the data from multiple frequency based tags. The reader used in proposed system is MFRC522. The MFRC522 is a highly integrated transmission module for contact-less at communication 13.56 M-Hz. It can be operated at low voltage.

1. RFID Tag:

The RFID tag is also known as transponders. It is an electronic tag that exchange data with a RFID reader through radio waves. Most RFID tags are made up of at least two main parts. The first is an antenna, which receives radio frequency waves. The second is an integrated circuit, which is used for processing and storing data, as well as modulating and demodulating the radio waves received/sent by the antenna. The tag contains

electronically stored information. RFID tag has two types active and passive. Passive tags collect energy from a nearby RFID reader's interrogating radio waves. Active tags have a local power source (such as a battery) and may operate hundreds of meter from the RFID reader. Active tags operate in absence of reader but for passive reader is must. Some tags have rewritable memory which size can varies according to the application requirement. Microchip which is inside the tag is to store the Unique Identification of each object.

2. Liquid Crystal Display:

The main aim of LCD in proposed system is to display the student ID. They are of many types. In this system, the LCD used is JHD 162A character LCD. It is a 16*2 LCD module i.e. it has 16 columns and 2 rows for display. It has 16 pins. It operates in either 8 bit mode or 4 bit mode. In 8 bit mode, an 8 bit is data is sent to the LCD from microcontroller whereas in 4 bit mode, 4 bit of data is sufficient to operate it.

3. Buzzer:

A buzzer is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. In proposed system it is use to give the confirmation to the student when the tag will match it make sound so that student will understood that he got a attendance.

IV. IMPLEMENTATION

First of all, the initial programming will be done in the system. Both RFID Reader and tag contains Transmitter and receiver antenna respectively. When the student carrying card /tag will come in the range of RFID Reader, the reader will read the data of that tag. The system will compare or verify the information with the database. If the information will match with the database, the LCD on the system will display the authentication message. At the same, the parents will be notified via SMS. If the information will not match with the database, the LCD will display unauthorized entry. The database will be designed by using PHP, which contains login options for Parents, teachers and others. The main work of database is to store the attendance data of students, which will then use to check the attendance records of students. It is more advantageous over GSM system, because GSM system requires reprogramming many times for notification to the parents. Therefore, database server will be implemented instead of GSM system.

V. REFERENCES

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