



International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 12, December 2013

ANYTIME ANYPLACE-REMOTE MONITORING OF STUDENTS ATTENDANCE BASED ON RFID AND GSM NETWORK

Mr.C.S.Karthikeyan¹S.Murugeswari²

Assistant professor, Dept. of ECE, Kamaraj College of Engineering and Technology, Virudhunagar, Tamilnadu, India¹

PG Part Time Student, [Applied Electronics], Dept. of ECE, Anna University Chennai, Tamilnadu, India²

ABSTRACT- General system is necessary to record and track student's attendance. The system must be capable to record students' attendance using interactive input, generating reports, viewing students' and lecturer's profiles, and providing students timetable. The system is applied to record attendance using barcode scanner. RFID technology has a lot of advantages such as simultaneous collection of large quantities of data with high accuracy, contactless, etc. RFID is the abbreviation of Radio Frequency Identification. RFID is a wireless identification technique which is used for the identification of physical objects like products, humans etc by the use of radio frequency. It is much faster and it has two components i.e. RFID tag and RFID reader. GSM network is used to send SMS to parents about the students detail. Short Message Service (SMS) is a text messaging service component of phone, web, or mobile communication systems, using standardized communications protocols that allow the exchange of short text messages between fixed line or mobile phone devices. GSM network can interconnect and roam all over the country, and its network ability is very strong, the user will not need another network.

KEYWORDS -RFID tag, RFID Reader, SMS, Remote monitoring system, GSM cellular Network.

I-INTRODUCTION

The Remote monitoring system is a real time monitoring system that monitors the remote location. The conventional method of taking attendance by calling names or signing on paper is very time consuming and insecure, hence inefficient. Radio Frequency Identification (RFID) based attendance system is one of the solutions to address this problem. This system is used at school, colleges, working places. Attendance records are necessary to conclude and authenticate students as well as employees of organization. Therefore, many researchers have been doing research in this area to improve and replace the traditional system of attendance by RFID technology. This RFID reader can take attendance easier, fast, and very secure and time consuming. The integration of mobile device with software is described for recording examination attendance. The establishment of remote monitoring platform is based on a GSM short message mode that can monitor and control the remote communication between the central monitoring station and remote monitoring stations. This system is proposed to utilize the GSM short message service and microcontroller to achieve remote real-time data monitoring. Using low cost RFID Based Attendance System prototype, the system provides several advantages over conventional method of taking attendance in class. The real time clock attendance taken will be more accurate and store. This system connected through the RS232 cable and store attendance to the database. The communication software is written in VB language to control the remote data and system database. The computer and Global system for mobile communication module SIM 300 are connected by RS232. The Remote data monitoring system includes a computer, RFID reader, GSM Module, Database in MS Access. The software is designed by using a Visual Basic (6.0).

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 12, December 2013

II. METHODOLOGY

A. RFID READER

RFID stands for Radio Frequency Identification. RFID is one member in the family of Automatic Identification and Data Capture (AIDC) technologies and is a fast and reliable means of identifying objects. There are two main components: The Interrogator (RFID Reader) which transmits and receives the signal and the Transponder (tag) that is attached to the object. An RFID tag is composed of a miniscule microchip and antenna. RFID tags can be passive or active and come in a wide variety of sizes, shapes, and forms. Communication between the RFID Reader and tags occurs wirelessly and generally does not require a line of sight between the devices. An RFID Reader can read through most anything with the exception of conductive materials like water and metal, but with modifications and positioning, even these can be overcome. The RFID Reader emits a low-power radio wave field which is used to power up the tag so as to pass on any information that is contained on the chip. In addition, readers can be fitted with an additional interface that converts the radio waves returned from the tag into a form that can then be passed on to another system, like a computer or any programmable logic controller. Passive tags are generally smaller, lighter and less expensive than those that are active and can be applied to objects in harsh environments, are maintenance free and will last for years. These transponders are only activated when within the response range of an RFID Reader. Active tags differ in that they incorporate their own power source, where as the tag is a transmitter rather than a reflector of radio frequency signals which enables a broader range of functionality like programmable and read/write capabilities.



Figure 1. RFID Reader

B. RFID TAG

RFID Tag is an IC chip that has unique hexadecimal or electronic product code (EPC) contained in it. Here „UNIQUE refers that each and every code word of the tag is independent of other code word. The tag acts as a key that is capable of opening a particular lock. So, it is also named as RFID key.

The tag is classified into 2 categories:

- 1.Active tags**
- 2.Passive tags.**

1. Active tags are active in nature i.e. they do not require any external source, they have their own in-built battery. It can transmit high frequencies so it can be detectable to a longer range.

2. Passive tags are passive in nature i.e. they don't have any battery source built in them. They transmit low frequencies so they are detectable up to few meters of distance.

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 12, December 2013



Figure 2. RFID Tag

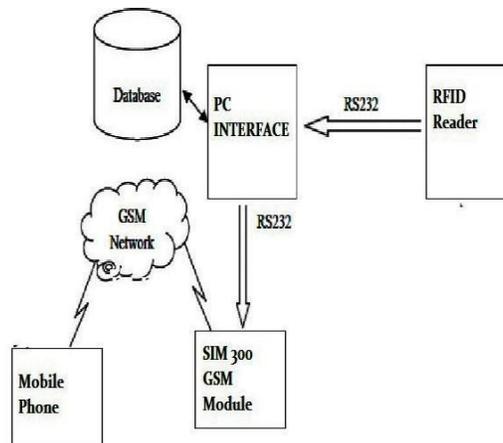


Figure 3. Block diagram of the Proposed Method

C. SOFTWARE OF REMOTE MONITORING SYSTEM

Software designed for the system is in Microsoft Visual Basics 6.0. The text mode is chosen for the transmission of SMS. AT commands are used here for the communication purpose.

AT+CMGF=1: for the selection of text mode of SMS.

AT+CMGS="mobile number": used to send the message on the given mobile number and after that Ctrl+Z is used to transmit the SMS.

D. PROGRAM AND DATABASE

Database is the backbone of the system because it is having all the data fields like ID, Name, Mobile Number, Password and the attendance record. In this system, we are using MS Access as a database back end and Microsoft VB as front end for the user. In VB, there are three forms designed. The main form contains labels, buttons, data grid, ADO data connection, textbox, and timer and MSCOMM components. ADODC is used to retrieve data from database and the data taken is viewed on data grid. The UART (RS-232) is used to send and receive data. The RFID data is sent to the system and then it will match with the database if it exists then the success message is shows else new records add/update button will appear and correspondingly the record is added and SMS will be sent.

E.GSM MODULE

The serial interface of SIM 300 is directly connected to the serial interface of PC computer.

International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 12, December 2013



Figure 4. GSM MODULE

III. EXPERIMENTAL RESULTS

The proposed novel method is programmed by using GSM MODULE. The performance of the circuit is evaluated on Students Database. Let be discuss about the performance evaluation.

a) Student attendance results

The below figure .5. Illustrates images of Students attendance results used for databases. This database consists of a Date and Time of attendance.

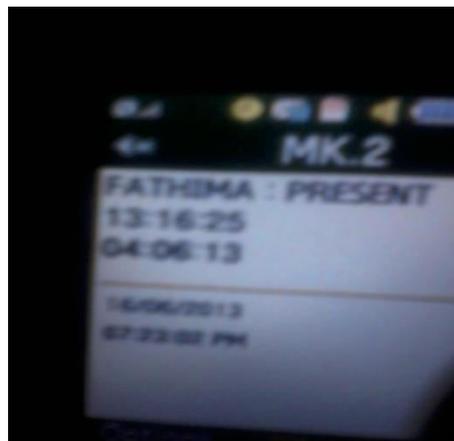


Figure 5. Student attendance results in parents Mobile



Figure 6. Student attendance present results as LCD



International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 12, December 2013

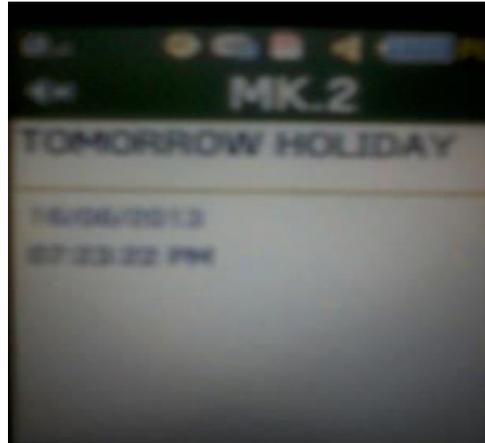


Figure 7. SMS output of the Holiday Details to parents Mobile



Figure 8. SMS output of the Holiday Detail as LCD

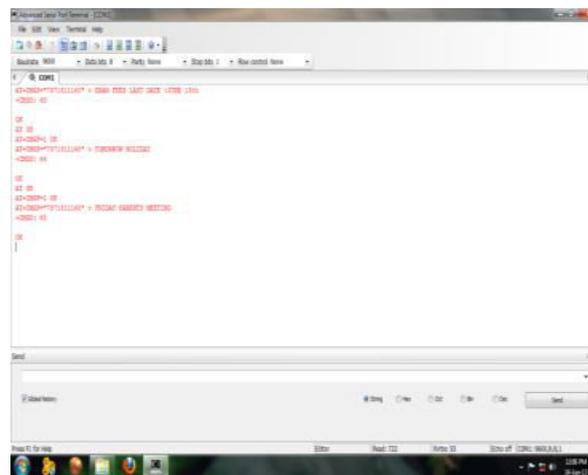


Figure.9. System Interface output for advanced serial port Terminal



International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering

(An ISO 3297: 2007 Certified Organization)

Vol. 2, Issue 12, December 2013

IV.CONCLUSIONS AND DISCUSSIONS

In this paper attendance of the students were maintained and their status updated to the parents. This is implemented by using RFID as a proof of their presents, also the status of the Students information about their presents send by sms via GSM. In case, the late comers are easily identified by the teaching faculty. The RFID Reader is Read the given data and transmitting the data to Mobile. The GSM Module sends the students attendance and any other information sent though sms to parents mobile. The designed system provides an acknowledgement to the parents whose attendance has been taken and when. It also describes the total percentage of attendance that is done by the parents. There are a lot of benefits of this system i.e. student's attendance record to the parents on daily basis attendance notification as they punch: reduces the overhead in the compilation of attendance. With the help of this proposed model, one can easily monitor data from any remote location via SMS, there is no need of direct contact, internet or any kind of request send by user as it is push based technique.

REFERENCES

- [1].B. Yusekkaya , A. A. Kayalar , M. B. Tosun , M. K. Ozcan and A. Z. Alkar "A GSM, internet and speech controlled wireless interactive home automation system", IEEE Trans. Consumer Electron., vol. 52, no. 3, pp.837 -843 2006.
- [2].A. Alheraish "Design and implementation of home automation system", IEEE Trans. Consumer Electron., vol. 50, no. 4, pp.1087 -1092 2004.
- [3]. S. Lee , K. N. Ha and K. C. Lee "A pyroelectric infrared sensor-based indoor location-aware system for the smart home", IEEE Trans. Consumer Electron., vol. 52, no. 4, pp.1311 -1317 2006.
- [4].K. C. Lee "Network-based fire-detection system via controller area network for smart home automation", IEEE Trans. Consumer Electron., vol. 50, no. 4, pp.1093 -1100 2004.
- [5].A. Z. Alkar "An internet based wireless home automation system for multifunctional devices", IEEE Trans. Consumer Electron., vol. 51, no. 4, pp.1169 -1174 2005.
- [6].Y. Tajika , T. Saito , K. Termoto , N. Oosaka and M. Isshiki "Networked home appliance system using bluetooth technology integrating appliance control/monitoring with internet service", IEEE Trans. Consumer Electron., vol. 49, no. 4, pp.1043 -1048 2003.