

ISSN No: 2348-4845 International Journal & Magazine of Engineering, Technology, Management and Research

A Peer Reviewed Open Access International Journal

The Campus Security Tracking System Based on RFID and Zigbee Network



Ch. Mohan Chowdary M.Tech- Embedded Systems, Aryabhata Institute of Technology & Science.



G.Ashok Assistant Professor, Aryabhata Institute of Technology & Science.



C.Madhusudan Assistant Professor & HOD, Department of ECE, Aryabhata Institute of Technology & Science.

ABSTRACT:

This paper implements Intelligent tracking system for campus security. The intelligent campus security tracking system is based on wireless communication services between nodes provided by RFID sensors and ZigBee. This system identifies the RFID tags within the region to prevent thefts and track the valuables, so as to protect the property of the stake holder on the campus. This system is based on radio frequency detection and IEEE 802.15.4 based ZigBee protocol. The tracking ability of RFID sensors and the ability of ZigBee to form a wireless sensor network have been effectively used in this paper to achieve the goal. RFID identifies the RFID tags on the Master and the slaves i.e valuables owned by the master, and then sends the sensed information to PC node through ZigBee. PC node generates corresponding warning depending on the result of match between the master and slave RFID tag information. When the warning occurs, its user can get the status of missing valuables, so the theft can be easily avoided.

Index-terms:

Microcontroller, RFID module, Zigbee module, liquid crystal display, Buzzer.

I.INTRODUCTION:

The design of an intelligent campus security tracking system is based on RFID and ZigBee system which has full range of protection on campus. The main concern is to stop the increase in theft in colleges. This paper gives exhaustive study on IEEE 802.15.4 Based Intelligent Tracking system [1]. The intelligent campus security tracking system is based on wireless communication services between nodes provided by RFID sensors and ZigBee, and identifies the RFID tags within the region to prevent thefts and track the valuables, so as to protect the property of the teachers and students. RFID tags are cheap, and can be reused. Data transmission is convenient and easy .ZigBee can be used to implement a wireless sensor network [2]. So by combining ZigBee and RFID technique we can achieve fast data transmission over a wide area by creating a wireless sensor network [3]. RFID sensor with ZigBee module will send the information of the read tags to the microcontroller. The micro- controller sends the data to wireless module to complete data transmission after simply data processing. ZigBee module provides two-way data transmission services and returns the corresponding control information obtained from micro-controller to PC for processing. The PC will give warning about the users and his valuables are valid or not.

II. IMPLEMENTATION OF PROJECT: 2.1 BLOCK DIAGRAM: Transmitter:



Volume No: 2 (2015), Issue No: 12 (December) www.ijmetmr.com December 2015 Page 283



ISSN No: 2348-4845 International Journal & Magazine of Engineering, Technology, Management and Research

A Peer Reviewed Open Access International Journal

Receiver:



Figure-2: Block diagram of receiver

2.2 ZIGBEE module:

ZigBee is a low-cost, low-power, wireless mesh networking proprietary standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage al-lows longer life with smaller batteries, and the mesh networking provides high reliability and larger range. The ZigBee Alliance, the standards body that defines ZigBee, also publishes application profiles that allow multiple OEM vendors to create interoperable prod-ucts. The protocols build on recent algorithmic research (Ad-hoc On-demand Distance Vector, neuRFon) to au-tomatically construct a low-speed ad-hoc network of nodes. In most large network instances, the network will be a cluster of clusters. It can also form a mesh or a single cluster. The current profiles derived from the ZigBee protocols support beacon and non-beacon enabled networks.



Figure-3: Zigbee module

2.3 ARM processor:

The ARM7TDMI-S is a general purpose 32-bit microprocessor, which offers high performance and very low power consumption. The ARM architecture is based on Reduced Instruction Set Computer (RISC) principles, and the in¬struction set and related decode mechanism are much simpler than those of micro programmed Complex Instruc¬tion Set Computers (CISC). This simplicity results in a high instruction throughput and impressive realtime inter¬rupt response from a small and cost-effective processor core. Pipeline techniques are employed so that all parts of the processing and memory systems can operate continuously. Typically, while one instruction is being executed, its successor is being decoded, and a third instruction is being fetched from memory. The ARM7TDMI-S processor also employs a unique architectural strategy known as Thumb, which makes it ideally suited to high-volume ap-plications with memory restrictions, or applications where code density is an issue. The key idea behind Thumb is that of a super-reduced instruction set.

2.3 RFID module:

Radio frequency identification is a powerful emerging technology that enables companies to achieve total business visibility. By knowing the identity, location and conditions of assets, tools, inventory, people and more, companies can optimize business processes and reduce operational costs. Radio frequency identification (RFID) is a generic term that is used to describe a system that transmits the identity (in the form of a unique serial number) of an object or person wirelessly, using radio waves. RFID reader module, are also called as interrogators. They convert radio waves returned from the RFID tag into a form that can be pressed on to controllers, which can make use of it. RFID tags and readers have to be tuned to the same frequency in order to communicate. RFID systems use many different frequencies, but the most common and widely used and supported by our Reader 125 KHz.

2.4 LIQUID CRYSTAL DISPLAY:



Figure-4: Liquid crystal display

A model described here is for its low price and great possibilities most frequently used in practice. It is based on the HD44780 microcontroller (Hitachi) and can display messages in two lines with 16 characters each. It displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics.



ISSN No: 2348-4845 International Journal & Magazine of Engineering, Technology, Management and Research

A Peer Reviewed Open Access International Journal

III. RESULTS:



Figure-5: Hardware implementation



Figure-6: Receiver section

IV. FUTURE SCOPE:

After implementing RFID protocol, we observed that we need to maintain a complete database which will indicate all the transactions like how many times only the master or master along with the slave has used the system. Also we can track the number of times invalid users have tried to cross the system. In this way we can completely protect the wide campus.

V. CONCLUSION:

We proposed an idea how RFID and ZigBee can be interfaced with microcontroller to handle the security issues in a campus. The system authenticates the user information by obtaining the swiped RFID details. A passive RFID tag makes the system cost effective and ZigBee implementation helps in covering wide area. In this way valuables of an individual can be protected.

VI. REFERENCES:

[1] Ying Chen, Yuntao Wang, Xiaokang Li, Li Gao, The Design and Implementation of Intelligent Campus Security Tracking System Based on RFID and ZigBee, 978-1-4244-9439-2/11 ©2011 IEEE.

[2] Waltenegus Dargie, Fundamentals of Wireless Sensor Networks: Theory and Practice Christian Poellabauer 47-68.

[3] Drew Gislason, Zigbee Wireless Networking 151-154.

[4] Wei Wang, Guangyu He and Junli Wan, Research on Zigbee wireless communication technology The National Natural Science Foundation of China (No. 51077079),978-1-4244-8165-1/11 ©2011 IEEE

[5] Freescale IEEE 802.15.4 / ZigBee Node RF Evaluation and Test Guidelines Reference Manual, Document Number: ZRFETRM Rev. 1.0 05/2010

[6] Shah, P., Vishwakarma Inst. of Technol., Pune, Shaikh, T., Ghan, K., Shilaskar, S., Power Management Using ZigBee Wireless Sensor Network, Emerging Trends in Engineering and Technology, 2008. ICETET '08.

December 2015 Page 285