

RF-ID Based Intelligent Attendance System

Harish.R¹, Indhires.V.N², Guru Prasath.A.S³, Harshavarathan.V.R⁴, Dr.L.Jubair Ahmed⁵

^{1,2,3,4,5}Department of Electronics & Communication Engineering

^{1,2,3,4,5} Sri Eshwar College of Engineering, Coimbatore, India

Abstract-Most educational institutions' administrators are concerned about student security. The conventional method allowing access to students inside a college/educational campus is by showing photo i-cards to security guard is very time consuming and insecure, hence inefficient. Radio Frequency Identification (RFID) based security system is one of the solutions to address this problem. This system can be used to allow access for student in school, college, and university .

Keywords-MSP430,RFID

I. INTRODUCTION

RFID is an acronym 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 just about any material object. This project can be used for security purpose where it gives information about the authorized persons and unauthorized persons. This can be applied in real time systems as such in recording the attendance, in the companies, airports for accessing the passports and in industries to know who are authorized. Primarily, the two main components involved in a Radio Frequency Identification system are the Transponder (tags that are attached to the object) and the Interrogator (RFID reader). Communication between the RFID reader and tags occurs wirelessly and generally doesn't require a line of sight between the devices. RFID tags are categorized as either active or passive. Active RFID tags are powered by an internal battery and are typically read/write, i.e., tag data can be rewritten and/or modified. An active tag's memory size varies according to application requirements. Passive RFID tags operate without a separate external power source and obtain operating power generated from the reader. This project uses passive tags. Read-only tags are typically passive and are programmed with a unique set of data (usually 32 to 128 bits) that cannot be modified. The reader has three main functions: energizing, demodulating and decoding. The antenna emits radio signals to activate the tag and to read and write data to it. In this project, the RFID module reader typically contains a module (transmitter and receiver), a control unit and a coupling element (antenna). This module is interfaced with the micro controller and when the card is brought near to the RFID module it reads the data in the card and displays on the

LCD. If the data in the card is matched with the data in the program memory then it compares and displays authorized message. If the data is not matched it displays unauthorized. The RFID module indicates a buzzer whenever it reads the data from the RFID card. The significant advantage of all types of RFID systems is the non contact, non-line-of-sight nature of the technology. Tags can be read through a variety of substances such as snow, fog, ice, paint, crusted grime, and other visually and environmentally challenging conditions, where barcodes or other optically read technologies would be useless. This project can provide security for the industries, companies, etc.

II. EXISTING SYSTEM

Arulogun O. T., Olatunbosun, A., Fakolujo O. A., and Olaniyi, O.M[1] proposed an attempt to solve recurrent lecture attendance monitoring problem in developing countries using RFID technology. The application of RFID to student attendance monitoring as developed and deployed in this study is capable of eliminating time wasted during manual collection of attendance and an opportunity for the educational administrators to capture face-to-face classroom statistics for allocation of appropriate attendance scores and for further managerial decisions.

III. PROPOSED SYSTEM

We using passive RFID card. It operates at the frequency of 125KHZ. RF Tag holds all the necessary information's about the students. We reads the information's using the RF reader .Here staffs are given separate pass codes. The students will be allowed to give the attendance only if the staffs entered their pass codes . Finally the attendance will be updated periodically.

IV. BLOCK DIAGRAM

A.BLOCK DIAGRAM

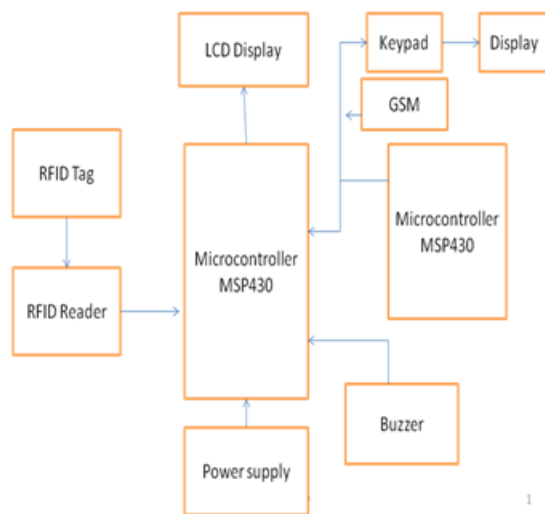


Fig2. Block Diagram

V. COMPONENTS

Components required for working of project are:

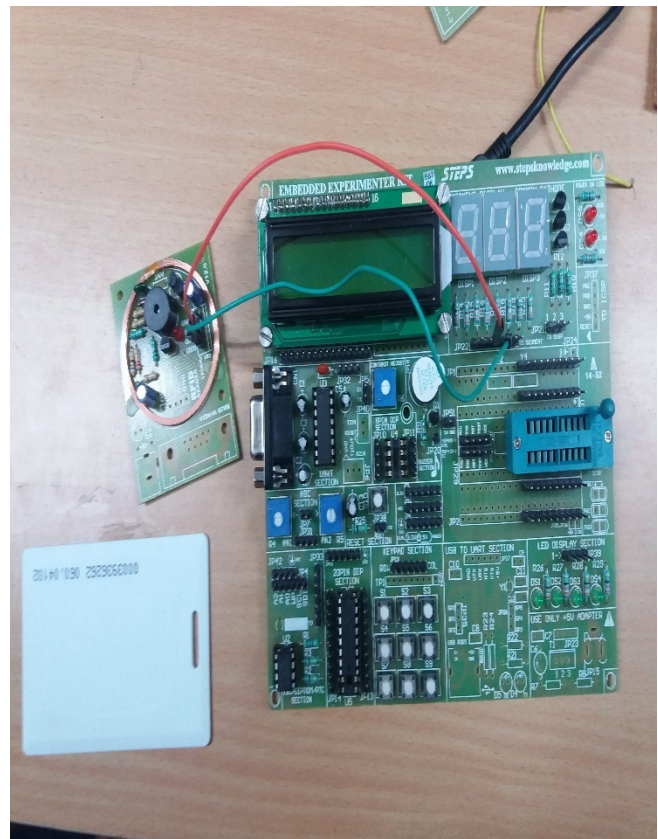
A.HARDWARE REQUIREMENTS

- MSP430 microcontroller
- RF Tag
- RF Reader
- LCD Display
- Buzzer
- Power Supply
- RS232 USB to Serial Port

B.SOFTWARE REQUIREMENTS

- Code Composer
- Embedded Language

VI. HARDWARE REQUIREMENTS



A. LAUNCH PAD

Launch Pad is an important design initiative, promoting the support and development of Australian product design through a unique, interactive program of events.

The Launch Pad program provides the local and international design community with a vital avenue to nurture and celebrate original, authentic and innovative emerging Australian design, thus supporting and cultivating the careers of those product designers involved.

In addition to an ongoing mentorship program with a network of industry experts, the winner of Launch Pad will receive access to the best minds across manufacturing, marketing, retail and public relations. A truly comprehensive foundation for continued success, this prize package also includes extensive media coverage across the entire Asia Pacific region via In design Media's continued support.

The depth and breadth of Launch Pad goes far beyond its annual exhibition of prototypes. The expertly Launch Pad program of events also promotes real relationships between people, ideas and products in design.

B. LCD DISPLAY



Fig4. LCD Display

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

C. BUZZER



Fig 6. Buzzer

Buzzer is an electronic device commonly used to produce sound. Light weight, simple construction and low price make it usable in various applications like car/truck reversing indicator, computers, call bells etc. Piezo buzzer is based on the inverse principle of piezo electricity discovered in 1880 by Jacques and Pierre Curie. It is the phenomena of generating electricity when mechanical pressure is applied to certain materials and the vice versa is also true. Such materials are called piezo electric materials.

D. POWER SUPPLY

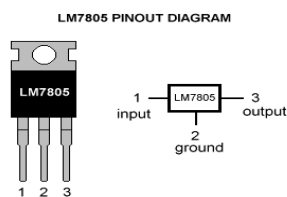


Fig 7.LM7805

The power supply circuits built using filters, rectifiers, and then voltage regulators. Starting with an ac voltage, a steady dc voltage is obtained by rectifying the ac voltage, then filtering to a dc level, and finally, regulating to obtain a desired fixed dc voltage. The regulation is usually obtained from an IC voltage regulator unit, which takes a dc voltage and provides a somewhat lower dc voltage, which remains the same even if the input dc voltage varies, or the output load connected to the dc voltage changes.

E. TRANSFORMER

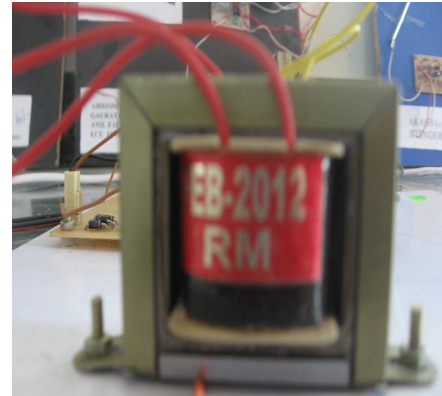


Fig 8. Transformer

The principle parts of a transformer and their functions are:

- The core, which makes a path for the magnetic flux.
- The primary coil, which receives energy from the ac source.
- The secondary coil, which receives energy from the primary winding and delivers it to the load.
- The enclosure, which protects the transformer from dirt, moisture, and mechanical damage.

Generally, the primary winding of a transformer is connected to the input voltage supply and converts or transforms the electrical power into a magnetic field. While the job of the secondary winding is to convert this alternating magnetic field into electrical power producing the required output voltage.

APPLICATIONS OF TRANSFORMER:

- Transformers have many applications in power transmission and electronics.
- They may be used to minimize energy losses due to voltage drop in transmitting electricity over long distances.
- They match loads with internal resistance so that there is maximum power transfer.
- They couple signals between electronic stages.

STEP DOWN TRANSFORMER

Step down transformer is one whose secondary voltage is less than its primary voltage. It is designed to reduce the voltage from the primary winding to the secondary winding. This kind of transformer “steps down” the voltage applied to it. As a step-down unit, the transformer converts high-voltage, low-current power into low-voltage, high-current power.

G. RS232 USB TO SERIAL PORT



Fig 9. RS232 USB TO Serial port

Scope of the Standard:

The Electronic Industries Alliance (EIA) standard MAX-232-C [3] as of 1969 defines:

- I. Electrical signal characteristics such as voltage levels, signaling rate, timing and slew-rate of signals, voltage withstand level, short-circuit behavior, maximum stray capacitance and cable length
- II. Interface mechanical characteristics, pluggable connectors and pin identification
- III. Standard subsets of interface circuits for selected telecom applications
- IV. The standard does not define such elements as character encoding or the framing of characters in the data stream. The standard does not define protocols for error detection or algorithms for data compression.

The standard does not define bit rates for transmission, although the standard says it is intended for bit rates lower than 20,000 bits per second.

Many modern devices can exceed this speed (38,400 and 57,600 bit/s being common, and 115,200 and 230,400 bit/s making occasional appearances) while still using MAX-232 compatible signal levels.

Details of character format and transmission bit rate are controlled by the serial port hardware, often a single integrated circuit called a UART that converts data from parallel to serial form. A typical serial port includes specialized driver and receiver integrated circuits to convert

between internal logic levels and MAX-232 compatible signal levels.

DESCRIPTION

- All kinds of satellites set-top box upgrade
- Router, HDD, ADSL, broad band modem firmware upgrade or cracked upgrade
- Cell phone, XBOX360, GPS serial communication, vehicle inspection and testing, DVD flash and so on
- Burn write STC MCU,NXP MCU, Renesas MCU, NEC MCU and so on
- Simple UART communication, commonly used UART debugging tools in super terminal
- USB signal transferred to TTL signal may be used by electronic enthusiasts

FEATURES

- Adopt imported controller PL2303HX, which can stabilize the flash with high speed
- 500mA self recovery fuse for protection
- Two data transmission indicator can monitor data transfer status in real time
- Reserve 3.3V and 5V pin interface, easy for the DDWRT of different voltage system that need power
- The entire board is coated by high quality transparent heat-shrinkable sleeve, making the PCB in insulation state outside, so that the board won't burnt down by material short cut
- Electrostatic package, insures the board will not be damaged before use

VII. SOFTWARE REQUIREMENTS

A. CODE COMPOSER STUDIO

Code Composer Studio is an integrated development environment (IDE) that supports TI's Microcontroller and Embedded Processors portfolio. Code Composer Studio comprises a suite of tools used to develop and debug embedded applications. It includes an optimizing C/C++ compiler, source code editor, project build environment, debugger, profiler, and many other features. The intuitive IDE provides a single user interface taking you through each step of the application development flow. Familiar tools and interfaces allow users to get started faster than ever before. Code Composer Studio combines the advantages of the Eclipse software framework with advanced embedded debug capabilities from TI resulting in a compelling feature-rich development environment for embedded developers.

An Overview Of Embedded Systems:

An embedded system is typically a design that uses the power of a small microcontroller, like the Microchip PIC[®] microcontroller (MCU) or dsPIC[®] digital signal controller (DSC). These microcontrollers combine a microprocessor unit (like the CPU in a personal computer) with some additional circuits called peripherals, plus some additional circuits on the same chip to make a small control module requiring few other external devices. This single device can then be embedded into other electronic and mechanical devices for low cost digital control.

Language Tools:

Language tools are programs such as cross-assemblers and cross-compilers. Most people are familiar with some of the language tools that run on a computer, e.g. ,Code composer studio, Visual Basic or C compilers.

When using language tools for embedded systems, Code Composer Studio includes C/C++ compilers tailored for TI's embedded device architectures. The proprietary compilers for MSP430 and MSP432 microcontrollers are tuned to provide optimized code size and performance. MSP430-GCC and ARM-GCC are free, open-source options for those who do not need the optimizations of TI's proprietary compiler Code.

GSM (Global System for Mobile Communications)

GSM is a standard developed by the European Telecommunications Standards Institute (ETSI) to describe the protocols for second-generation (2G) digital cellular networks used by mobile phones, first deployed in Finland in July 1992. As of 2014 it has become the de facto global standard for mobile communications – with over 90% market share, operating in over 219 countries and territories 2G networks developed as a replacement for first generation (1G) analog cellular networks, and the GSM standard originally described as a digital, circuit-switched network optimized for full duplex voice telephony. This expanded over time to include data communications, first by circuit-switched transport, then by packet data transport via GPRS (General Packet Radio Services) and EDGE (Enhanced Data rates for GSM Evolution or EGPRS). Subsequently, the 3GPP developed third-generation (3G) UMTS standards followed by fourth-generation (4G) LTE Advanced standards, which do not form part of the ETSI GSM standard.

VIII. CONCLUSION

Usually attendance is taken manually in university or colleges. The manual attendance system takes too much time. The main advantage of this project is to update the attendance instantly after the attendance is taken. Maintenance of paper documentation is neglected abruptly because the details of the students will be uploaded in the memory device with fully enhanced attendance system.

IX.ACKNOWLEDGMENT

We are thankful to our Institute Sri Eshwar College of Engineering, Coimbatore, India for providing all the facilities needed for our project.

REFERENCES

- [1] Chitresh, S and Amit K (2010),”An efficient Automatic Attendance Using Fingerprint Verification Technique”,International Journal on Computer Science and Engineering (IJCS),Vol. 2 No. 2,pp 264-269.
- [2] Henry. S, S. Arivazhagan and L. Ganesan (2003),”Fingerprint Verification Using Wavelet Transform”,International Conference on Computational Intelligence and Multimedia Applications, 2003.
- [3] Maltoni D, D. Maio, A. K. Jain, S. Prabhaker (2003),”Handbook of Fingerprint Recognition”, Springer, New York, Pp 13-20.
- [4] Victor S, Jonathan M, Reece J, and Lemire J(2003),”Student Wolfpack Club Tracking System”,North Carolina State University. USA. Retrieved by
- [5] Nambiar A.N. (2009),” A supply chain perspective of RFID Systems”, World Academy of Science, Engineering and Technology Journal, Volume 6,pp1-5.
- [6] Mohamed A.B, Abdel-Hamid A and Mohammed K.Y.,(2009), ”Implementation of an Improved secure system detection for E passport by using EPC RFID tags”, World Academy of Science, Engineering and Technology Journal, Volume 6,pp1-5.
- [7] Dawes A.T. (2004),”Is RFID Right for Your Library”,Journal of Access Services, Volume 2(4), pp 7-13.
- [8] Longe O.O.(2009),”Implementation of Student Attendance System using RFID Technology”, B. Tech Project Report, Ladoke Akintola University of Technology, Ogbomoso, Nigeria.

- [9] Jubair Ahmed.L & Ebenezer Jeyakumar, A 2013,"Maximum Tsallis Entropy Thresholding for Image Segmentation Using a Refined Artificial Bee Colony Optimization."International Review on Computers & Software, vol.8, no.8, pp.1923-1930.
- [10] Jubair Ahmed, L & Ebenezer Jeyakumar, A 2013, 'Image Segmentation Using a Refined Comprehensive Learning Particle Swarm Optimizer for Maximum Tsallis Entropy Thresholding', International Journal of Engineering and Technology, vol.5, no.4, pp.3608-3616.
- [11] Jubair Ahmed, L & Ebenezer Jeyakumar, A 2014," Image Segmentation using a Hybrid Genetic Algorithm with Tabu list for Maximum Tsallis Entropy Thresholding" Australian Journal of Basic and Applied Sciences, vol.8, no.16, pp. 378-387
- [12] Visnu Priya.G, Kokilamani.S, Jubair Ahmed.L 2014 ,,"Efficient Localization Scheme For A Low Power Content Addressable Memory Based On Xnor Cell" International Journal of Emerging Technologies in Computational and Applied, vol.7, no.3, pp. 260-264.
- [13] Jubair Ahmed.L, Manikandan.V, Sathishkumar.R, 2015 "Energy Efficient Huddling Data Collection In Wireless Sensor Networks" International Journal of Advanced Engineering and Recent Technology , vol.2, no.1,pp. 1–7.
- [14] Jubair Ahmed.L, Manikandan.V, Sathishkumar R, 2016 "Enhanced Life Time of Wireless Sensor Networks Using Dual Hop Clustering" Imperial Journal of Interdisciplinary Research , vol.2, no.6,pp. 177–182.