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# RFID Counter

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**Abstract:** As of late, there have been ascend in the quantity of utilization's dependent on Radio Frequency Identification (RFID) frameworks and have been effectively connected to various zones as different as transportation, social insurance, agribusiness, and cordiality industry to give some examples. RFID innovation encourages programmed remote identification utilizing electronic latent and dynamic labels with reasonable perusers. In this paper, an endeavor is made to tackle intermittent library participation observing issue in creating nations utilizing RFID innovation. The use of RFID to library participation observing as created and sent in this investigation is fit for killing time squandered amid manual system of filling name and mark in index and an open door for the instructive heads to catch eye to eye measurements for further administrative choices.

**Keywords:** Microcontroller, RFID Cards, EM-18 RFID Reader Module, LCD, Buzzer, LEDs

## I. INTRODUCTION

RFID is a mechanized ID and information accumulation innovation that guarantees progressively precise and auspicious information passage. RFID isn't really another innovation; it just immediately increased more consideration as of late in view of its present minimal effort and advancement in other fields that gives opportunities in many other regions. RFID merges radio frequency and microchip technologies to make a splendid structure that can be used to perceive, show, secure and store data. At their most effortless, RFID systems use unassuming chips called tags that contain and transmit some piece of recognizing information to a reader, a device that interface with microcontroller. The ability of RFID systems to pass on accurate and exact data about bar code or RFID no. on tag will improve capability and pass on various focal points to businesses and clients in future that is not so far. To enter in a library for examining in quiet spot or to take any book we need to make segment in register log book which can extremely repetitive if there is a long queue. This strategy is at any rate dull, unsavory and troublesome in light of the way that the significant time that could by one way or another or another been used for scrutinizing book. Despite all of these troubles, the entries are recorded physically by the executive and thus are slanted to singular mix-ups. There emerges a requirement for an increasingly productive and powerful technique for taking care of this issue. The use of RFID Technology will prompt end or decrease of the quality time squandered amid manual enrollment of passage in register book, formation of an understudy database the board framework that isn't inclined to mistakes or being controlled by anybody or more all guides in better administration of library measurements for designation of books with every understudy.

## II. LITERATURE REVIEW

Different related works exist recorded as a hard copy, utilization of RFID Technology to different zones and expressly to the zone of academic cooperation checking issue.

A. Abdel-Hamid A., Mohamed A. B. 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*, Vol-6, pp1-5.

Here writers structured and actualized a model of a verified and convenient implanted per user framework to peruse the biometric information from the electronic international ID. The creators endeavored to take care of issues of unwavering quality, security and protection in E-international IDs by validating holder web based utilizing Global System of Mobile (GSM) Communications. GSM incorporates the principle interaction among ID focus and the e-visa per user. The correspondence information is ensured among server and e-international ID per user by utilizing AES to scramble information for security while exchanging through GSM organize.

B. Liu C. M. and Chen L. S. (2009), "Applications of RFID technology for improving production efficiency in an Integrated-circuit packaging house", *International Journal of Production Research*, vol.47, no. 8, pp. 2202-2254.

Here creators investigated the utilization of RFID in an incorporated circuit(IC) bundling house to determine stock exchange issues. His examination recommends that RFID contributes noteworthy enhancements to the water accepting procedure and the stock exchange process that diminish work cost and man-made blunders.

C. Chitresh S. and Amit K. (2010), "An efficient Automatic Attendance Using Fingerprint Verification Technique", *International Journal on Computer Science and Engineering (IJCSE)*, Vol. No. 2, pp 264-269.

Here a customized investment structure using one of a kind imprint check technique was proposed. The one of a kind finger impression technique affirmation was practiced using extraction of abnormal point on the edge of customer's novel finger impression or subtleties method. The affirmation asserts the validity of an endorsed customer by performing adjusted examination of a got interesting imprint groups against the set away formats in the database. The proposed customized investment system hails either evident or false reliant on reasonable eventual outcome of past adjusted check of person's authenticity.

### III. PROPOSED METHODOLOGY

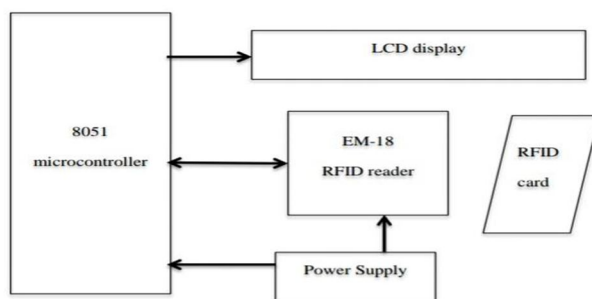


Figure 1 Block Diagram of RFID Counter system

In this project the RFID counter which is based on 8051 microcontroller is used in order to record the count of students or staff with just one swipe of card.

Following are a portion of the primary segments utilized for making the task

#### A. EM-18 Reader Module

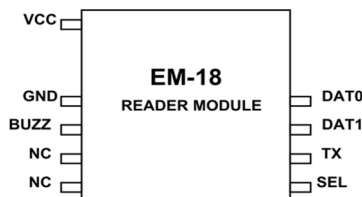


Figure 2 EM-18 Reader Module

Inside the EM-18 reader module there is copper winding. This winding are utilized as antenna by the reader. Power supply needed to EM-18 RFID reader is 10V DC supply. At the point when the tag is put close to the peruser, because of the initiated shared inductance vitality, information is exchanged to peruser. Peruser then exchanges information to the microcontroller. Microcontroller checks for the information persistently, if any information is gotten, microcontroller thinks about the information in database. On the off chance that the tag is validated, microcontroller takes the participation.

#### B. RFID Tag

RFID tag/card is enacted when it goes through a radio frequency of 125 kHz (passive tag), which is produced by the reception apparatus implanted inside the EM-18 RFID reader.

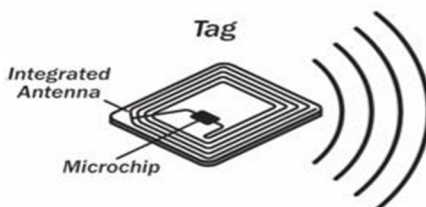


Figure 3 Internal Structure of RFID card

The program first checks the swiped RFID card is valid or not. If the tag is valid program will save the data in the card and keep the note of this event's occurrence. If the tag is not valid system will notify about the invalidity of the card and also suggest to apply legitimate card. Because of the reason of expense and adaptability of usage, this RFID counter application utilizes an inactive tag and along these lines for each understudy would need to convey their labels near the peruser (around 10 cm distant from peruser). After that, the peruser or reader peruses the card and the system records the understudy's landing time.

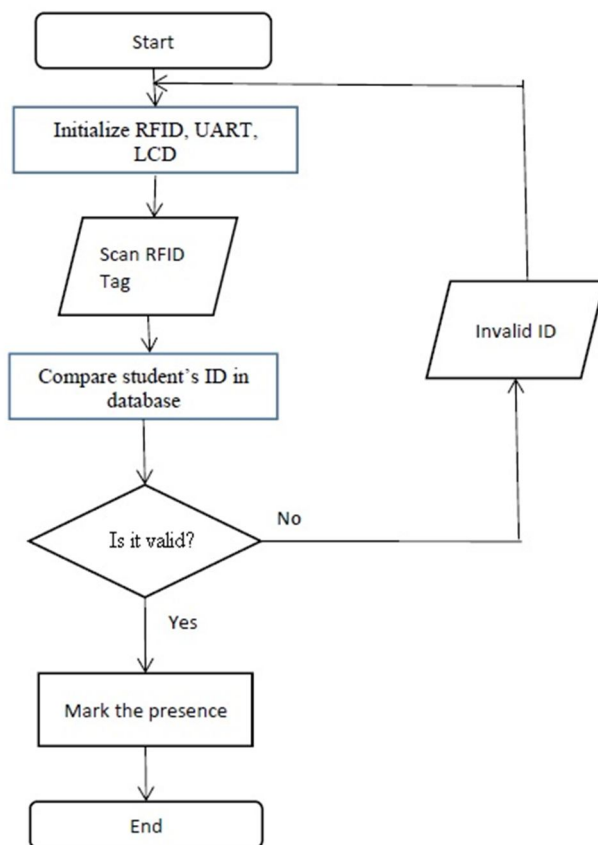
*C. Microcontroller*

AT89C51 is utilized every now and again in light of the fact that it has an incredible microchip or microcomputer or incorporated circuit. It is 8 bit microcontroller and has a place with Atmel 8051 family. It has low power utilization and gives an exceptionally adaptable and financially savvy answer for some installed control applications. It has two 16 bit clocks/counters, 4k bytes of in framework programmable flash memory and 128 byte of RAM, 32 programmable I/O lines, programmable sequential channel, six interrupt on sources.

*D. Algorithm*

- 1) In the wake of making every one of the associations, turn on the RFID counter system.
- 2) LCD will notify message "SWIPE YOUR CARD".
- 3) Swipe the card above the reader from distance around 10cm.
- 4) Peruser then peruses the information in the tag and transmits to the CPU.
- 5) Data in the tag and database is compared. On the off chance that the tag is coordinated LCD shows "VERIFIED" and tallies your participation.
- 6) Now try placing different card which is not saved in database then check for it's validity.
- 7) This time LCD shows "Unapproved" and it won't mark your presence.
- 8) Along these lines, we can utilize execute this circuit.

*E. Flow Chart*





#### IV. DISCUSSION

RFID counter framework comprises of RFID Reader, power supply unit, RFID Tag and LCD display and microcontroller unit. USART is used to interface microcontroller with RFID. Information is exchanged from RFID cards to peruser and from that point to microcontroller. Radio frequency innovation is utilized in numerous applications. RFID tags are of two kinds – 1) Passive Tags and 2) Active Tags. Passive tags contain 13 digit number label inbuilt in it, though active tag is perused/compose tag for example one can peruse from the tag and keep in touch with the tag. This task utilizes passive tag.

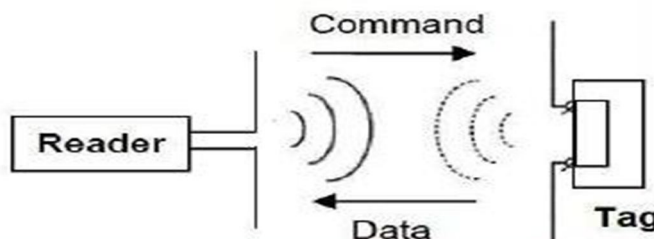


Figure 4 Backscatter Coupling

An electromagnetic field proliferates outward from the investigator's antenna, and a little extent of that field (diminished by free-space constriction) achieves the label's antenna. The power is provided to the antenna associations as high-frequency voltage, and after amendment by diodes it very well may be utilized to control the tag or initiate or deactivate the tag. Some extent of the approaching RF vitality is reflected by the antenna and reradiated outward into free space. The measure of vitality pondered depends how well the antenna couples to the electromagnetic wave. RFID labels that utilization backscatter to answer to their questioners have antennas that are intended to reverberate well with the transporter signal produced by the cross examiner. The reflection attributes of the antenna, its successful cross-segment, can be affected by changing the load associated with the antenna. To transmit information from the tag to the cross examiner, a load resistor associated in parallel with the antenna is turned on and off in time with the information stream to be transmitted. By changing resonant properties of its antenna, the label makes itself a decent or poor reflector. This differs the quality of the sign reflected from the tag, making an example that is identified at the cross examiner as information. This strategy is alluded to as modulated backscatter.

#### V. SOFTWARES USED

##### A. Express PCB

Express PCB empowers extremely quick fast improvement of Electronic Schematics and Printed Circuit Board Layouts. Fledglings and particularly advance clients can rapidly move a thought from idea to a physical PCB.

##### B. Microcontroller Programming Language: Embedded C

Embedded C is a set language augmentations for the C programming language by the C norms Committee to address shared characteristic issues that exist between C expansions for various installed frameworks.

##### C. Kiel uvision IDE

The keil 8051 toolbox incorporates three primary instruments, assembler, compiler and linker. An assembler is utilized to amass 8051 gathering program. A compiler is utilized to arrange C source code into an article record. A linker is utilized to make a flat out article module reasonable for in-circuit emulator.

8051 undertaking advancement cycle utilizing keil includes following advances.

- 1) Create source records in C or get together.
- 2) Compile or collect source records.
- 3) Correct mistakes in source records.
- 4) Link article records from compiler and assembler.
- 5) Test connected application

##### D. Flash Magic

Flash Magic is Windows software for programming flash based microcontrollers from NXP using In-System Programming technology (ISP) or Ethernet convention while in the objective equipment.

## VI. OBJECTIVES

### A. Accurate and Timely Student Report

Since this is an electronic system the process of taking attendance happens in fraction of seconds and accurate time of student's entry is reported.

### B. To keep records of students visiting to library

Record of desired period, of student's attendance can be maintained on the basis of memory storage capacity of the system.

### C. Automatic digital registration of attendance

The registration of attendee is done using digital method so there is no need of another person's intervention which helps in avoiding human error while taking attendance.

### D. RFID tags can be used as traditional ID cards

RFID tags can be used even in absence of RFID reader for multiple purposes which make it more reliable.

## VII. RESULT ANALYSIS

At the point when system is turned ON, at first it will notify to "SWIPE YOUR CARD" on the LCD screen. At the point when the RFID peruser recognizes the tag, It forwards the distinctive tag number to microcontroller by means of sequential terminal.

With the assistance of programming, microcontroller looks at the got card no. with the numbers that are as of now put away in the microcontroller database.

Once, in the event that any of these numbers are coordinate with the gotten card no., at that point the relating name put away in that no. is shown on the LCD screen and furthermore the mean the name put away for the comparing number is taken.

By squeezing the catch, the participation recording will be shut and the subtleties are shown on the LCD screen more than once until the microcontroller has been reset.

## VIII. ACKNOWLEDGEMENT

We present our appreciation and earnest gratitude to College Of Engineering, Phaltan for their steady inspiration and backing while at the same time making the task.

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