MJRET
Open Access
Multidisciplinary Journal of Research in Engineering and Technology
Journal homepage: www.mjret.in
ISSN:2348 - 6953

RFID BASED ATTENDANCE SYSTEM

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Abstract: *Nowadays, the attendance system in most of the schools and colleges is documented manually. But, this process takes lots of time. The proposed system uses a wireless technology (RFID).Every student is provided with an RFID tag, which includes an inbuilt IC for storing and processing the information. The block diagram of this project includes a microcontroller, an oscillator circuit, preset circuit, LCD display and an RFID reader. In this RFID based Attendance System project, we will explain you how can we count attendance automatically by using RFID cards. RFID Technology (Radio Frequency Identification and Detection) is commonly used in schools, colleges, office and stations for various purposes to automatically keep a track of people. Here we will count the attendance of an authorized person by using RFID.*

By using RFID Tag and RFID Reader in system we can calculate and maintain the attendance of each student. Also By using GSM module we can send the message to parent about student is present or not. So the time required for taking attendance is reduce.

Key Words: *Attendance system, ARM 7 MICROCONTROLLER, RFID, GSM etc.*

1. INTRODUCTION

RFID, which stands for Radio Frequency Identification, is an automatic identification technology used for retrieving from or storing data on to RFID Tags without any physical contact [1]. RFID system primarily comprises of RFID Tags, RFID Reader, Middleware and a Backend database. RFID Tags are uniquely and universally identified by an identification sequence, governed by the rubrics of EPC global Tag Data Standard [2]. A tag can either be

passively activated by and RFID reader or it can actively transmit RF signals to the reader [3]. GSM MODEM is a class of wireless MODEM devices that are designed for communication of a computer with the GSM and GPRS network. It requires a SIM (Subscriber Identity Module) card just like mobile phones to activate communication with the network. Also they have IMEI (International Mobile Equipment Identity) number similar to mobile phones for their identification [4]. The RFID reader, through its antenna, reads the information stored on these tags when it's in its vicinity. The reader, whose effective range is based on its operational frequency, is designed to operate at a certain frequency. The operational frequency of the reader ranges from 125 KHz – 2.4 GHz [5].

Some students do not come to classroom due to one reason or the other and because of this they do not perform well in their examination, so there is need to monitor student attendance in the classroom to enhance their academic performance. Students are expected to attend 60 percent of the class before they are allowed to sit for the course examination. The manual method of taking attendance in schools and colleges in Nigeria over the years has become a thing of concern. In the manual method of taking attendance students are required to write down their names and sign the attendance list. The problems associated with this method vary from unnecessary time wastage to improper documentation, students forgetting to put down their names on the attendance list or students writing on behalf of other students that are absent from the class. To eradicate the deficiencies associated with the manual attendance system, an automated approach is implemented through Radio frequency identification (RFID) technology. host system application. The RFID based automatic attendance system is used for automatically taking Students' attendance and giving warning to students on cases of low attendance which could degrade the performance of student or prevent the student from taking the course examination, if the class attendance percentage is less than 60.

2. PROPOSED SYSTEM

The propose of this system to take attendance of students through RFID tag and RFID Reader. in this machine GSM machine also included to send message to their discern. therefore this propose gadget gives ensurity to parent that, weather the child attending the class or bunk the magnificence. This proposed machine additionally include the switches to display the day and time desk .similarly to this, IR sensor also are used in this device to ensure how a good deal pupil all enter the class room. the main motive in the back of this device is to lessen human efforts, Paper paintings or lessen the time.

3. SYSTEM ARCHITECTURE

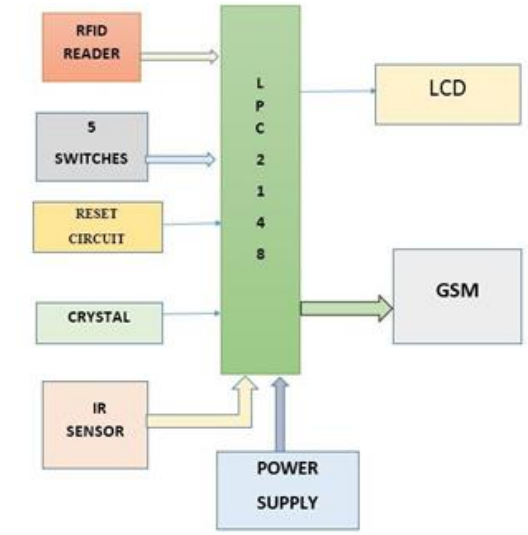

Figure 1. Block diagram of the system

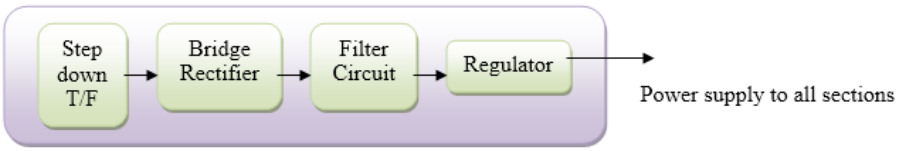

Figure 2. Power supply

As shown in figure 1, After making all of the connections of attendance gadget, give the power supply to replace on the circuit. The lcd will presentations, please swipe the card. The statistics stored within the RFID tag is said as the id and attendance of the pupil. while the man or woman locations the cardboard in front of the RFID reader, it reads the statistics and matches with the information stored inside the microcontroller. The microcontroller is preprogrammed with embedded c program language period. while a person positioned their RFID tag to RFID reader then RFID reads tag's information and ship it to microcontroller after which microcontroller compares this facts with described information or records. If data is matched with described information then microcontroller increment the attendance with the aid of one of the tag's person and if matched isn't always took place then microcontroller shows invalid card on lcd.

Figure 2, shows power provide diagram. Step down electrical device rework high voltage to low voltage. This low voltage is given to the bridge rectifier that convert Alternate Current(AC) to Direct Current(DC).This DC is given to the Filter that take away the unwanted

AC Current and provides pure DC current to the Regulator that maintain the desired voltage (3.3 v) for planned system.

4. SYSTEM REQUIREMENT

HARDWARE

- ARM 7 microcontroller
- IR sensor
- RFID
- LCD 16x2
- GSM

SOFTWARE

- Keil
- Proteus
- Proload/ flash magic

HARDWARE DESCRIPTION

ARM 7:

The LPC2148 rely on a sixteen/32 bit ARM7TDMl-S CPU with constant imitating and implanted observe bolster, collectively with 128/512 kilobytes of installed fast glimmer reminiscence. A 128-piece huge memory interface and an thrilling quickening agent design empower 32-bit code execution at maximum extreme clock fee. For primary code estimate packages, the option sixteen-bit Thumb Mode decreases code through extra than 30% with negligible execution punishment. With their minimum sixty four stick bundle, low strength usage, distinct 32-bit clocks, four-channel 10-bit ADC, USB POBT, PWM channels and 46 GPIO strains with as much as nine outer intrude on pins these microcontrollers are especially affordable for mechanical manipulate, restorative frameworks, get to govern and motive of-offer.

Key features

- 8 kB to 40 of on-chip static RAM and 32 kB to 512 kB of on-chip flash memory.
- 128-bit wide interface/accelerator enables high-speed 60 MHz operation.
- In-System Programming/In-Application Programming (ISP/IAP) via on-chip boot loader Software.
- Single flash sector or full chip erase in 400 ms and programming of 256 bytes in

1 ms.

- Embedded ICE RT and Embedded Trace interfaces offer real-time debugging with the
- On-chip Real Monitor software and high-speed tracing of instruction execution.
- USB 2.0 Full-speed compliant device controller with 2 kB of endpoint RAM.

IR SENSOR

An infrared sensor is an electronic device that emits so one can sense some components of the environment. An IR sensor can measure the warmth of an object in addition to detects the motion. those styles of sensors measures only infrared radiation, in preference to emitting it that is called as passive IR sensor. typically within the infrared spectrum, all the objects radiate a few shape of thermal radiations. these types of radiations are invisible to our eyes that may be detected by an infrared sensor. The emitter is surely an IR LED (mild Emitting Diode) and the detector is truly an IR photodiode which is touchy to IR light of the identical wavelength as that emitted through the IR LED. while IR light falls on the photodiode, the resistances and those output voltages, alternate in percentage to the importance of the IR light received.

RFID

The RFID reader is a module with RFID reader and antenna. it's far small in size and integrates with any kind of hardware design. it's miles used to examine the records saved in the RFID tags. The RFID tag includes an integrated circuit, which is used for storing and processi ng the statistics, modulating and demodulating the radio frequency sign this is to be transmitted. when a person suggests the RFID tag in the front of the RFID reader and the reader reads the information and compares the information saved inside the machine. If the facts fits with the stored facts, the machine authorizes the man or woman and allows to go into the secured place in order that the character can take manage of diverse gadgets. The device also shows the result at the liquid crystal display. If it unearths the provided statistics mismatched then, it alerts an unauthorized access with a buzzer sounds as an indication of entering or supplying incorrect records.

LCD (LIQUID CRYSTAL DISPLAY)

Liquid crystal display stands for Liquid Crystal display. Liquid crystal display is finding wide unfold use replacing LEDs (seven section LEDs or other multi segment LEDs) because of the following reasons.

1. The declining expenses of LCDs.

2. The ability to show numbers, characters and portraits. this is in comparison to LEDs, which can be limited to numbers and a few characters.
3. Incorporation of a clean controller into the lcd, thereby relieving the CPU of the mission of refreshing the liquid crystal display. In comparison, the LED ought to be refreshed by using the CPU to maintain displaying the records.
4. Ease of programming for characters and snap shots. these additives are "specialized" for getting used with the microcontrollers, this means that that they can't be activated via general IC circuits. they may be used for writing specific messages on a miniature liquid crystal display.

GSM MODEM: This GSM modem is a especially bendy plug and play Quad band GSM modem for direct and smooth integration to RS232. supports functions like Voice, facts/Fax, SMS, GPRS and integrated TCP/IP stack.

Features:

- Quad Band GSM/GPRS 850/900/1800/1900 Mhz
- GPRS multi-slot class 10/8
- GPRS Mobile station class B
- Compliant to GSM Phase 2/2+
- Control via AT commands(GSM 07.07,07.05 and enhanced AT commands)
- Operation Temperature(-20 deg C to +55 deg C)

5. ADVANTAGES

1. Lessen paperwork and shop time and money with cell and cloud-based attendance management device.
2. Take away replica facts access and errors in time and attendance entries.
3. Calculation of go away and praise factors accrued
4. Track the attendance of teachers and staff, assign work and manage allocation
5. Hold the parents knowledgeable about the pupil's performance via e mail & SMS signals.
6. Auto-generate diverse types of reviews of class or pupil attendance.
7. Increased security and confidentiality with role-based permissions to users.

6. APPLICATION

1. RFID based attendance system can be used in educational institutions, industries, anywhere.
2. RFID is emerging technology and is used in applications where authentication is needed.

7. RESULT AND DISCUSSION

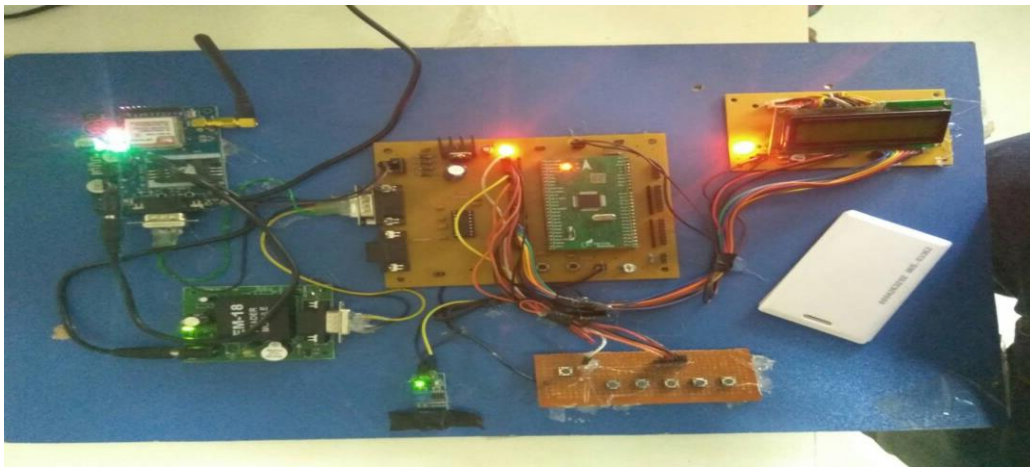

Figure 3. Overall Circuit Component connection of proposed System.

The above figure 3, shows the connection between various component as per the proposed System.

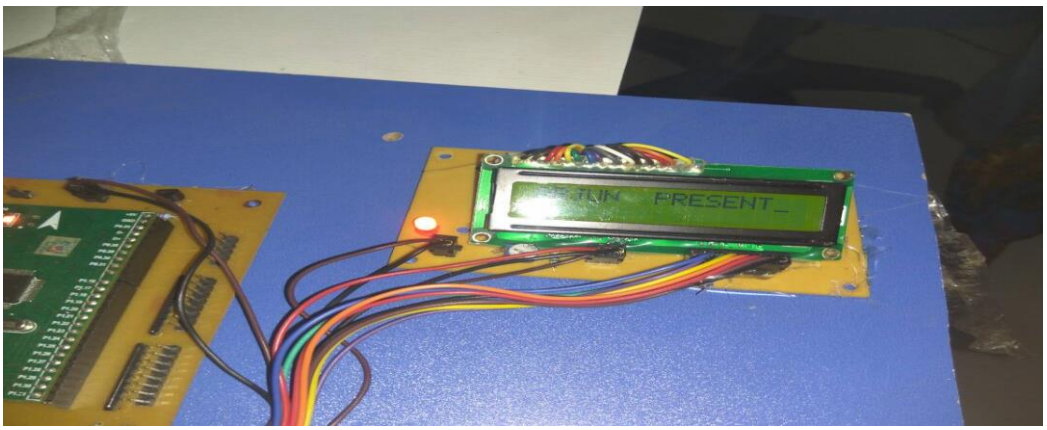

Figure 4, Output

The above figure 4, shows the authenticated output like ”ARJUN PRESENT” after swapping RFID tag.

8. FUTURE SCOPE

Further improvement can be undertaken on this project for better enhancement: A webcam can be integrated into the system to monitor the person who swaps the card, thus avoiding

the problem of a person scanning in for another person. The attendance system can be enhanced to biometric technology which is a full proof technique that captures a person's unique biological or physical features and prevents unauthorized activities.

9. CONCLUSION

The design and implementation of a RFID primarily based automatic attendance gadget that's the intention and goal of this paper changed into effectively carried out. This gadget gives an effective and more handy technique of taking attendance when in comparison to the guide machine. data are more organized, the gadget is user pleasant, information manipulation and retrieval is accomplished through the graphical interface. The system may be implemented in any academic organization..

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