

**RFID ATTENDANCE MODULE WITH DATA LOGGER**

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Abstract: Radio Frequency Identification (RFID) is a new technology in communication system which can be defined as a medium used to identify and track the special tag implanted into an object or a living thing by using radio frequency wave. It is a wireless medium of communication that uses electromagnetic and electrostatic coupling in the radio frequency portion of the spectrum to communicate between reader and tag through a variety of modulation and encoding schemes. RFID is a nascent technology, deeply rooted by its early development in using radio frequency identification (RFID) as a harbinger (indicator) of adversary plans during World War 2nd. Uniquely identifying each person based on RFID tag is one of its special abilities that can make the recording attendance process become more faster and easier compared to conventional methods.

Keywords: Arduino nano, RFID reader RC522, LCD display 16x2, micro SD card Module, Piezo buzzer, LED, RTC Module.

I. INTRODUCTION

RFID based attendance system is an advanced attendance management system that has an RFID reader, RFID Tag, LCD display, a microcontroller, and a data base (SD Card) unit that allows the wireless communications to establish the identity of students, faculty, or any other staff. There is also an RTC module which keeps tracking time and date and lets us know if someone is late or on time. SD Card is placed which stores the data or attendance.

RFID attendance system is used to take attendance for student in school, college, and university. By placing their ID Cards on the reader, students or workers can immediately verify their attendance. RFID attendance system provides wireless identification of stakeholders when they fall in the radiofrequency range of the RFID attendance reader. To mark the attendance automatically, the student or staff needs to carry the RFID tag that contains unique information about them such as name/ID number/class/section. The receiver/reader of the RFID attendance system automatically registers the attendance and saves the attendance data in the ERP system. The administrator can anytime extract the data to get a summary of student attendance history and keep a tab on them as well as faculty attendance for salary and payroll management.

II. RFID reader RC522:

The RC522 is a 13.56 MHz RFID module that is based on MFRC522 controller from NXP semiconductors. RFID reader features an outstanding modulation and demodulation algorithm to serve effortless RF communication at 13.56 MHz. The main function of RFID reader module is to read the installed inside the card. Its working flow started by sending a command from Arduino nano to the reader module together with authorization key where UART interface is used as a medium.

III. ARDUINO NANO:

Arduino nano is a small Arduino board based on ATmega328P or ATmega6. The Arduino nano board runs the Arduino IDE and mini USB. The Arduino IDE software must be installed on a respected laptop or desktop. The mini USB transfers the code from the computer to the Arduino nano board.

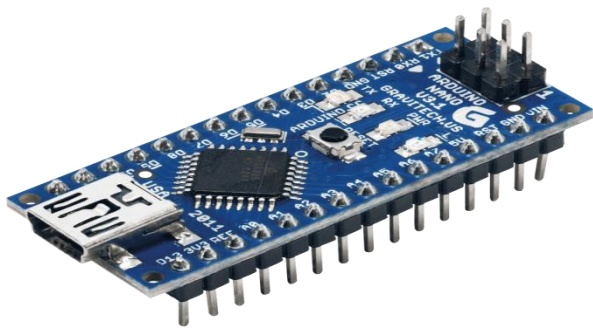


FIGURE: THE ARDUINO NANO

IV. REAL TIME CLOCK (RTC) Module:

The DS1307 RTC Module is a time tracking device that gives the current time and date. The RTC Module made of clock chip DS1307. This module is generally used in computers, laptops, mobiles, embedded system application devices etc. to provide time and date. RTC Module work on I2C protocol.

The DS1307 RTC Module is consist of mainly 5 key components. This are DS1307 RTC chip, 32KHz crystal oscillator, 24C32 EEPROM chip, battery holder, and soldering place for DS18B20 temperature sensor.

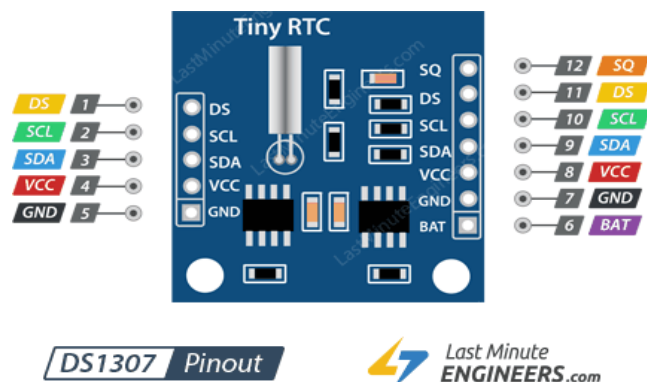


FIGURE: DS1307 RTCMODULE

V. RFID TAGS

RFID Tags are a type of tracking system that uses smart barcodes in order to identify items. RFID is short for “Radio frequency identification,” and as such, RFID Tags utilize radio frequency technology. These radio waves transmit data from the tag to a reader, which then transmit the information to RFID computer program. RFID Tags are frequently used for merchandise, but they can also be used to track vehicles,

pets and even patients with Alzheimer’s disease. An RFID Tag may also be cold and RFID chip.



FIGURE: RFID TAG

How RFID Tag work?

- An RFID Tag works by transmitting and receiving information via an antenna and a microchip- also sometime called an integrated circuit or IC. The microchip on an RFID Reader is written with whatever information the user wants.
- There are 2 main types of RFID tags battery operated and passive. The name suggest battery operated RFID tag contain an on board battery as a power supply where as passive RFID tag does not , instead working by using electromagnetic energy transmitted from RFID reader.

VI. Micro SD Card Module:

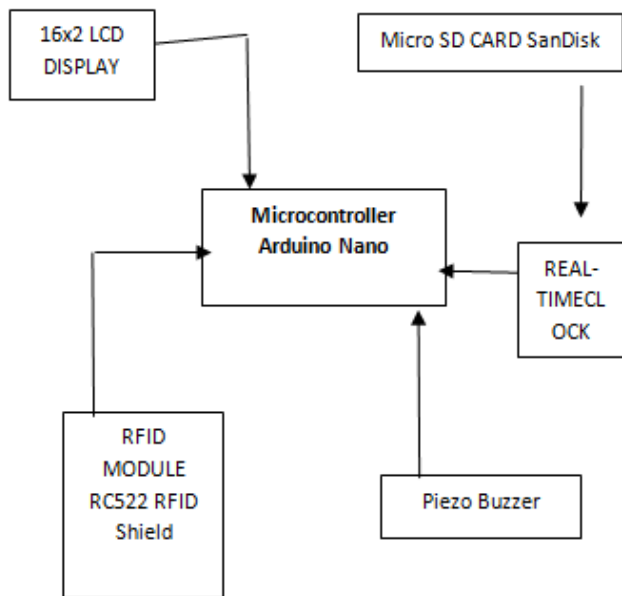
The micro SD card module is a simple solution of transferring data to or from standard SD card. The pin out is directly compatible with Arduino, but can also be used with other micro controllers .it allows to add mass storage and data logging.



FIGURE:MICRO SD CARD MODULE

This module has an SPI interface which is compatible with any SD card and it uses 5V and 3.3V power supply which is compatible with Arduino.

VII.HARDWARE ARCHITECTURE:



Radio frequency identification (RFID) uses electromagnetic field to automatically identify and track tags attached to objects. The tags contains electronically stored information. RFID is one method of automatic identification and data capture (AIDC) ISO / IEC 20248 specified a digital signature data structure for RFID barcodes providing data , source and read method authenticity . this work is done within ISO / IEC JTC 1/ SC 31 automatic identification and data capture technique.

VIII. CONCLUSIONS

The Attendance System using RFID is developed with the purpose to automate and improve the current processes and procedure of manual attendance recording. In developing the system, a person had to prepare 3 major scopes of functions which include the Arduino microcontroller, RFID module and microSD Card module. The system is developed using Arduino Integrated Developed Environment (IDE) software as its main platform. IDE is used because of its open source and a very easy to program user interface. Overall, the objective of this project is achieved. A portable RFID reader with data storage for the purpose of recording attendance

which enables the communication between ATmega 2560 and a computer via serial port Universal Asynchronous Receiver/Transmitter (UART) is managed to build. From that, this device can be implemented in UTP in order to improve management system especially in recording attendance.

IX. REFERENCES

- [1] Aysha Qaiser and Shoab A Khan, "Automation of time and Attendance Using RFID System" IEE-ICET 2nd International conference on Imaging Technology, 2006.
- [2] Grant Homeback, Alex Babu, Bobby Martin, Ben Zoghi, madhav Pappu, and Rohit Singhal, Automatic Attendance System Journals, from RFIDSensNet Lab; 2001.
- [3] Sato DCS & Labeling Worldwide, "The RFID Guidebook (Revision 8)", 2004
- [4] M.K. Yeop Sabri, M.Z.A. Abdul aziz, M.S.R. Mohd Shah, M.F. Abd Kabir, "Smart Attendance System By Using RFID" Asia Pacific Conference on applied Electromagnetics Proceedings, 2007
- [5] Wayne Wolf, "A Decade of Hardware/ software Co-design" IEEE 5th International Symposium Multimedia Software Engineering (MSE), 2003
- [6] Claudio Talarico, Aseem Gupta, Ebenezer Peter, Jerzy W. Rozenblit, "Embedded System Engineering Using c/c++ Based Design Methodologies" 12th IEEE International Conference and Workshop on The Engineering of Computer based system, 2005
- [7] Yuanrui zhang and Mahmut Kandemir, "A hardware-software co-design strategy for Loop intensive application" IEEE 7th symposium on Application specific processors (SASP), 2009
- [8] <http://www.embedded.com/design/debug-and-optimization/4216254/HW-SW-co-verification-based--part1--Determining-what-how-to-verify>
- [9] Jozsef kopjak and Janos Kavacs, "Event Driven software modeling of combinational logic network based control programs" IEEE 16th International Conference of Intelligent Engineering System, 2012
- [10] Mohammed Abdallah, and Omar Elkeelany, "Simultaneous ulti-channel Data Acquisition and stroing System," ICC, pp.233-236, 2009 International Conference on Computing, Engineering and Information.
- [11] Omar Elkeelany and Vivekanad S.Todakar, "Data Concentration and Archival to SD Card via Hardware Description Language" 3rd IEEE International Workshop on Management of Emerging Network and service.