RFID BASED PROJECTS FOR SCIENCE AND ENGINEERING STUDENTS

Radio-Frequency Identification (RFID) is a technology that uses radio-frequency electromagnetic fields to transfer information from an RFID tag to the RFID reader for identification purposes.

The tags used do not require battery power and in turn, they derive power from the electromagnetic field generated from the reader. Few tags are also available which have their own power source.

RFID technology is used in many industrial applications for tracking purposes. For example, it is used in manufacturing industries such automobile industry to track the vehicle during the complete production cycle of it. The RFID tags can also be fixed to books, mobile phones, electronic equipment for tracking purposes.

Check out our list of various RFID based projects, These RFID based projects are very helpful for computer science and engineering students in doing their project work.

RFID Based Projects for Engineering Students

The radio-frequency is an automatic identification process used for transmitting data between an RFID tag and RFID reader with the help of radio-frequency electromagnetic fields. The RFID tag is a device used to store data of any stuff, persons, books, animals, etc. RFID tags are of different types some tags can be placed near to the RFID reader and some can read from far away distances beyond the line of sight of the reader.

There are different types of RFID systems in the market that consists of an antenna, transceiver, and a transponder. These systems operate at different frequency ranges like low frequency (30-500 kHz), mid-frequency (900-1500 kHz), and high frequency (2.4-2.5GHz). Let us see one of the example-based applications of the RFID-based-attendance-management system in brief.

Below mentioned are few RFID based projects ideas that will help engineering students to understand RFID technology and to develop various applications out of it.

These RFID based projects can be used for multiple applications by just modifying the program burnt in the microcontroller.

1. RFID Security Access Control System

The RFID system is used to authorize the tag holder to enter a secure area. It reads the data present on the RFID tag and compares it with data present in the microcontroller. If the data is matched, it displays the status of authorizing the entry which is indicated with a lamp coupled with an LCD display.

Here the RFID card is used, which is inductively coupled to the reader. When the card is swiped against the reader, the modulated data from the card is sent to the reader. This data is fed to the microcontroller. The card used is the identity card for the particular person and carries his/her details. When this data matches the data stored in the

database of the microcontroller, the person is given the authority to enter the secured area. Here this is indicated by the lamp is switched on.

The microcontroller is programmed such that when the data matches with the existing data, the relay driver gets a high logic input at one of its input pins. The corresponding output pin goes low to provide a proper connection to the relay. The relay coil now gets energized and the armature shifts its position such that now the whole circuit is completed and the load gets supply from AC mains and gets switched on. The status of the authority of the person is also displayed on the LCD display interfaced to the microcontroller.

2. RFID based Attendance System

An RFID tag is used along with the reader to input the details of the employee/ student for tracking their attendance. When the RFID is swiped on the reader, the data of the tag is compared with data in the microcontroller (interfaced to the reader) to identify the user. An LCD is interfaced to the microcontroller to display the name of the user. Additionally, a status button is used to display the overall attendance of the user.

Here an RFID tag is used which is indirectly connected to the RFID reader using the inductive coupling method. As the tag or the card is swiped against the reader, the tag receives a carrier signal from the reader and in turn modulates the carrier signal and sends it back. The reader receives this modulated signal and sends this data to the microcontroller. The microcontroller compares this data with the existing data and on pressing the status push button, the status of the cardholder is shown on the display, indicating the attendance of the cardholder.

3. RFID based School Attendance System

The aim of this project is to maintain the record of the students' attendance by using RFID tags. Each student is issued with his/ her authorized tag, which can be used for swiping in front of the RFID reader to record their attendance.

In most of the colleges and schools, attendance is recorded manually – such a process consumes lots of time. In this proposed system, the attendance system is implemented by using advanced wireless technology "RFID". Only the authorized students are provided with the RFID tags. This tag consists of an inbuilt integrated circuit for storing and processing information. The circuit diagram of the RFID based project for the school attendance system is shown below. The required components used in this project are discussed below.

4. RFID based Paid Car Parking

This RFID based project can also be used to control the entry and exit of cars into the parking system, using the RFID tag. The tag can be used as a credit card where the parking amount is deducted and accordingly the car gets entry to the parking lot. The RFID card of the driver is swiped and the control unit accordingly deducts the amount from the card and displays the parking space number on the display.

5.RFID based Automatic Door Locking System

This project is used to design an automatic door locking system using RFID. Please refer to this link to know more RFID based Automatic Door Lock System with Arduino

6. RFID based Library Management System

At present, RFID technology is used in small & medium-sized libraries. By using RFID, library administrator work can be reduced and the user can arrange and search the library books very easily. In this proposed system, there are special techniques are implemented to arrange the books, books, DVDs, journals, and so on. So that users can find out their books very easily. This system overcomes the problem facing by most of the libraries.

7. RFID based Smart Card Security System

This project is used to design a security system based on RFID. In this project, RFID technology is used in vehicles to provide additional security in tracking the vehicles. These security systems will offer a precise and protected way to give access to different locations such as companies, gated community, secured parking in companies, etc.

8. RFID based Prepaid Energy Meter Project

This proposed system is used to design a prepaid energy meter project using RFID. This system includes a recharge button depending on the RFID tag given to every user. Every user can recharge their card with some amount and based on the recharge amount, the user will get the recharged unit within their card. The user needs to swipe the card using RFID Reader which is attached to the energy meter. Once the user swipes the card, then the total & remaining units will exhibit on the display. Here the display is connected with the meter. When the RFID has low units under 2 units then it generates a beep sound.

9. RFID based Voting Machine

The main objective of this project is to design a cost-effective and efficient voting system. This project is used to reduce the problems in the electronic voting machine. In this project, an RFID reader is used to detect the RFID tags with a unique identity. In the elections, RFID tags including unique identity are allotted for every candidate.

The RFID module is connected to the Arduino controller so that casted votes can be counted, stored, and displayed on the LCD. In order to stop multiple votes, a switch is used, so this project gives an efficient & clear voting procedure.

10. RFID based Health Care System

In the health department, RFID technology is not only used for reducing health care prices and also facilitates the process of automating & streamlining patient recognition using mobile devices such as smartphones, PDA for designing a management system for health care. This project is used in hospitals, health care departments, etc.

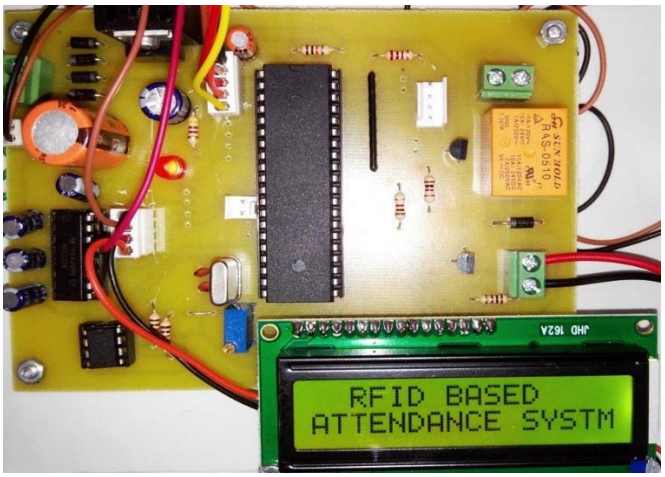
11. RFID based Bus Announcement System for Blind

This project designs an RFID based project for the bus detection system. The main concept of this project is to give a bus announcement to blind people for ease of traveling. This project is designed with two detection subsystems, one for bus detection and another one for bus stations. In bus detection, the near bus stations will be simply noticed & announced through a voice signal within the bus whereas, in the bus station, the upcoming buses will be noticed & announced in the bus station to give an alert to the blind people.

Some More RFID based Project Ideas

- RFID Application Strategy and Deployment in Bike Renting System
- Consumer Acceptance of RFID Technology: An Exploratory Study
- Application Fields of RFID in Health Safety and Environment Management
- Shopping Path Analysis and Transaction Mining Based on RFID Technology
- RFID Instrumentation in a Field Application
- RF Controller Development and Its Application in Intelligent Transport System
- A Multi-Carrier UHF Passive RFID System
- Transportation Quality Monitor Using Sensor Active RFID
- A Component-based Reconfigurable RFID Middleware
- Parameter Estimation of RFID Network Data Traffic Load
- Adaptive k-Way Splitting and Pre-Signaling for RFID Tag Anti-Collision
- Design and Experiments on Cable Inspection Robot
- Replacing Cryptography with Ultra-Wideband (UWB) Modulation in Secure RFID
- Utilizing RFID Signaling Scheme for Localization of Stationary Objects and Speed Estimation of Mobile Objects
- RFID based project for Library Automation System
- Security Access Control System Using Bar Code Reader
- RFID based Project for Electronic Passport System
- Library Automation Using Bar Code Reader
- Smart Card-based Access Control System
- RFID based Project for Airport Luggage Security Scanning System
- Smart Card based Electronic Passport System
- RFID based Project for Banking System
- RFID based Latch.
- RFID based bus Indicator.
- RFID based Toll Booth Automation.
- RFID based Intelligent Signals.
- RFID based Unmanned Petrol Pump.
- RFID based Car Parking.
- RFID based Hotel Room Management.
- RFID based Person Tracking.
- RFID based CAR for signal break detection.
- A Mobile RFID -Tracking Security System

- RFID based Prescriptions in Automated Pharmaceutical Systems
- RFID based Intelligent Books Shelving System
- RFID based Equipment/Personnel Tracking in Hospitals
- RFID based Valuable Objects Insurance Identification
- RFID based Vehicle Tracking and Monitoring System
- RFID Fare Verification – RFID Bus Pass System
- RFID based Automatic Toll Tax Deduction System
- RFID based Electronic Road Pricing for Controlling the Traffic
- RFID based Event Tracking System for Sports
- RFID based Project for Inventory Tracking System
- RFID based Project for Parts Tracking System for Manufacturing
- RFID based Project for Prepaid Energy Meter with Recharge Option
- RFID based Railway Platform to Display Exact Position of Each Coach
- RFID based Project for Railway Reservation
- Bus Fare Pay System for Passengers
- Medi-card for Patients
- RFID Enabled Passport Verification
- RFID Enabled Voter-ID
- RFID based Projects Ration Card
- Score Card for Industries using RFID
- RFID based Shopping Cart
- RFID based Project Petrol Pump Automation System
- RFID mobile charging system



For any further help regarding your RFID Project Demo Kit, please contact us.

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