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RFID BASED POWER CARD FOR INDIAN RAILWAYS

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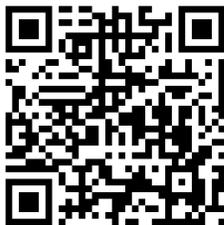
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Abstract: The RFID technology has been developing fast and implemented likewise over all across the developed countries and developing countries like INDIA as well. Here we are proposing a simple ,cost-effective and which can be practically implemented scheme of using the power ports available in Indian trains for some timed intervals of time so that “each and every” passenger in Indian railway bogie(in reservation section only) gets to use the power ports. The power ports available are used for mobile and laptop charging. This system uses rfid cards to detect the particular passenger and allows him to use the power for some specific intervals of time. In this way every passenger is only allowed a certain specific duration to use the power port and hence no passenger can monopolise over the power port.

Keywords: RFID Tags, RFID Reader, Microcontroller, Railways, Power port, Bar code, Trains

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INTRODUCTION

Radio Frequency Identification (RFID) using uniquely numbered electronic tags is used to provide some kind of identity to the subjects [1] RFID is an electronic technology whereby digital data encoded in an RFID tag is retrieved utilizing a reader. In contrast to bar code technology, RFID systems do not require line-of-sight access to the tag in order to retrieve the tag's data.

This technology is rapidly implementing on vast scale in India. And hence it is finding various innovative applications.

The RFID cards available are mainly of two types as the active cards and the passive cards.

The active cards are programmable while the passive cards or tags are non-programmable.

But mostly the passive tags are used as they are cheap and easy to implement and use as well.

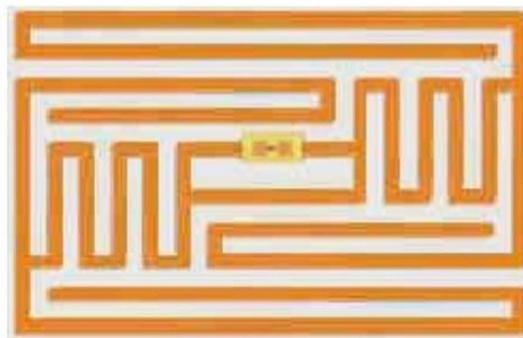


Figure:-Internal diagram f passive RFID tag

So here passive rfid cards are used which store a 12 bit code .Every card has a unique 12 bit code and hence it is assigned to each passenger separately. And would be provided at the time of boarding the train.

According to the unique code of the passenger, each and every passenger would be allotted a specific time period to use the power socket in the reservation bogie of the Indian rails.

After the specified time period is over the power supply to the socket is cut off. Also there would be four more chances to use the power port by that particular person. And lastly there would be an emergency chance too for the passenger to use the power port.

Each and every chance would be of different time periods including the last emergency chance. So that every passenger gets equal chance to use the power port for charging and thereby wastage of power is also prevented.

Flowchart

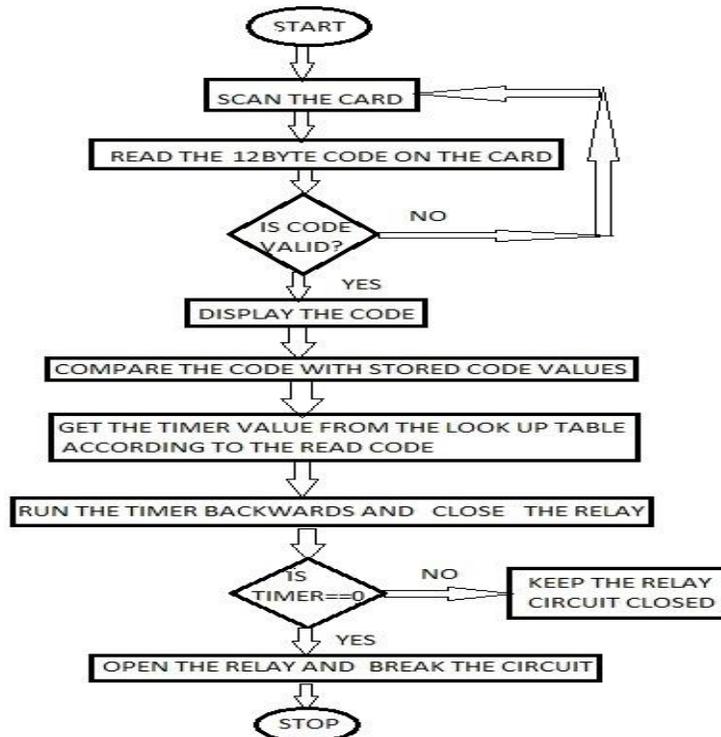


Figure:- Flow Chart of operation

Working principle

This proposed project would be requiring some main components which are very essential for successfully running of the project. They are the Microcontroller unit, an LCD display ,RFID reader ,Relay Circuit and of course RFID tags .The tags are available in the of key chains and cards . But mostly cards are preferred over the key chain type tags.

The LCD display is a display which displays the characters and numbers as sent by the microcontroller unit as it is programmed.

The microcontroller preferred here is At mega 328 as the programming get increased up to a size of 32 kilo bytes but if the efficiency of the coding is increased then it might fit in At mega 8 too .Also other microcontrollers can be used here as well .

But mostly AVR microcontroller is preferred because they are easy to program and in that Atmega8 is preferred because it is the most basic microcontroller available of AVR.

Firstly the Rfid reader will be initialized and would be in the reading mode and hence a message would be displayed on the screen to asking the passengers to please swipe his/her particular rfid card. As soon as a passenger swipes his/her card across the rfid reader , the rfid reader reads the card and transmits the 12 bit unique code of the particular card to the microcontroller at 9600 baud rate and then the microcontroller(like atmega 328 as shown here in block diagram) detects that particular passenger and displays his/her name on lcd by comparing his card's no. with the database inside of it .Then next thing done is recognizing which turn or chance is that particular passenger is using for using the power port for recharging .Then according to the no, of chance of that passenger the microcontroller closes the relay for that specific period of time which is mentioned for that particular turn.

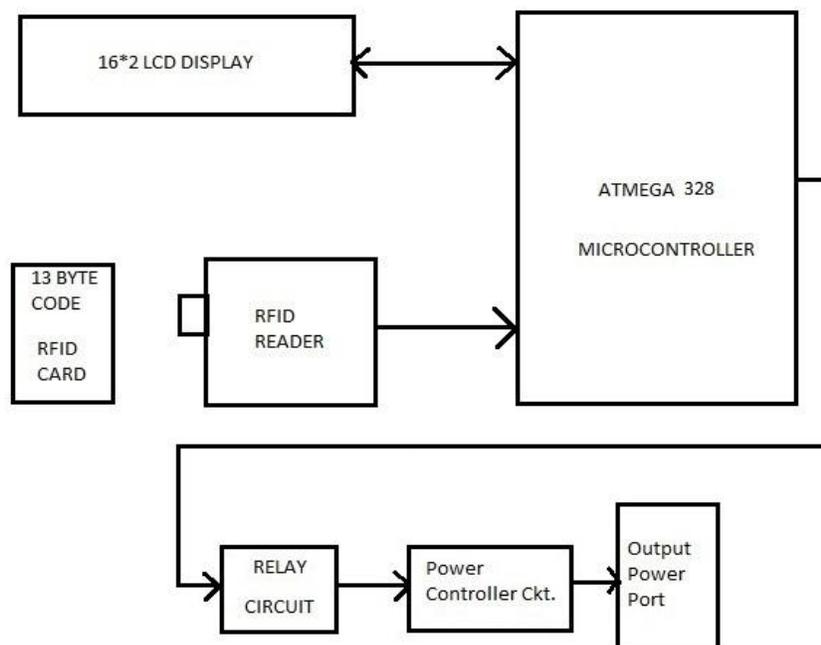


Figure:-Block Diagram of Operation

For example, if there is a passenger of rfid card no. 23456DE2QW24 and this no. is assigned to be the second passenger by the railway database at the departure station of that particular station and while travelling in the reservation bogie ,he finds need to recharge his mobile; he

will try to find the power port and then swipe his card .Then the MPU will recognize him as passenger no. 2 and then as he is using the power port for first time,he will be assigned the first chance of timer and his timer will start and the relay will close the power port circuit and that passenger will be able to use the power port for a particular period of time. Then after the timer is reaches zero the relay opens up and hence the circuit breaks and the turns counter is also incremented by one .In this way the passenger would be able to use the power port for 6 times for different intervals of time and after which the rfid card would get expired.

In this way all the passengers would use the power port more sensibly and at the same time every passenger would get a chance to use the power port for at least once.

Advantages of rfid

RFID benefits were identified as improved inventory management, velocity of retail cycle, integrated business model, and efficiency of store operation. Huge data packs can be store in RFID as compared th barcode, Unique item identification is easier to implement with RFID than with barcodes, Its ability to identify items individually rather than generically. Tags are less sensitive to adverse conditions (dust, chemicals, physical damage etc.).for detecting the RFID tag no additional humans are required as required in barcode Also several tags can be read at the same time as others, Sensors can also be combined with RFID tags ,and also at several places automatic reading eventually decreases time lags anh thereby inaccuracies are reduced as well..

As no line-of-sight is required, tag placement is less constrained, RFID tags have a longer read range than, e. g., barcodes, Tags can have read/write memory capability, while barcodes do not.

Limitation to rfid

Because of the recent developments and rapid applications of the barcode technology the rfid technology is facing terrible hindrances in the spreading and development of itself in developing countries like India. But still the barcode requires to be scanned more than once to be properly read by the barcode scanner or reader.

But the bar code is also limited to the use and implementation because it store less data as compared to RFID tags.

Also the cost of implementation is a little bit higher than the cost of implementation of barcodes and hence it proves to be limitation to the implementation of RFID technology.

Future applications

This proposed project can be found to be very well rich with future applications. The most common one can be to use the rfid cards to order food, i.e to apply for the pantry in the train which reduces the need for the extra personnel which are required just for taking orders from the passengers for the applying for the pantry for lunch or dinner.

Also there are many more future applications las the facilities available In the train increases they can be integrated with this proposed project as well like if in the near future WiFi becomes available in the railways ,i.e if the trains get internet accessibility to its passengers then this proposed project can be used to restrict the usage of the data of the internet and hence the load can be reduce as well on the servers .

Also it would be more efficient to order for other things which are required and are available in the journey through this rfid card system like the soaps, breakfast, newspaper, etc.

CONCLUSION

Though RFID is an old technology it still was not rapidly spreading in developing countries like India, but still until recently it is growing

And developing in India and hence this project could be very useful and efficient for Digital India.

Also RFID provides high security as compared to other existing systems like bar code and QR code. But Q R code is tough to implement in India and to understand by common middle class men.

In order to implement contemporary system of “RFID based swipe card draw power in Indian Railways” the embedded systems plat- form has utilized. And hence this proposed project seems to brought about equality among masses and also conserve the power.

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