

RFID Based Swipe Card and Draw Power in Indian Railways

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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; Power; Railways; Electronic tags

Introduction

Radio Frequency Identification (RFID) establishes the identity of subjects in the physical world using uniquely numbered electronic tags [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 [2].

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 (Figure 1).

Working Principle

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 at mega 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 [3-5].

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 (Figure 2).

Advantages of RFID

RFID benefits were identified as improved inventory management, velocity of retail cycle, integrated business model, and efficiency of store operation. An RFID tag can store large amounts of data additionally to a unique identifier, 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.).

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 [6].

Obstacle to RFID

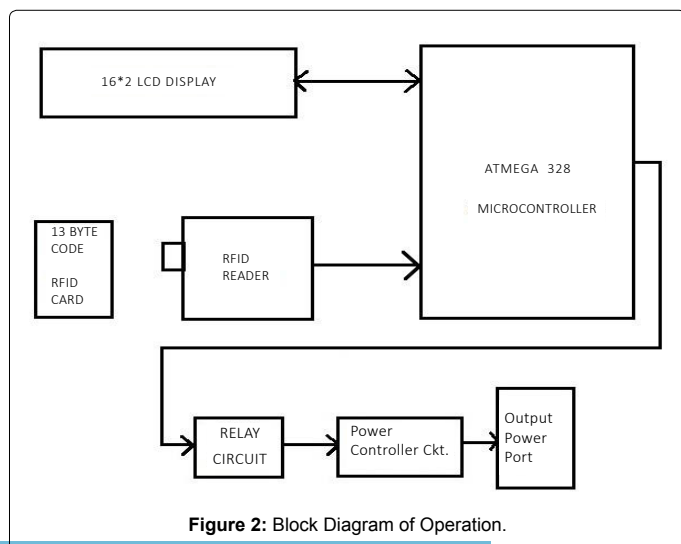
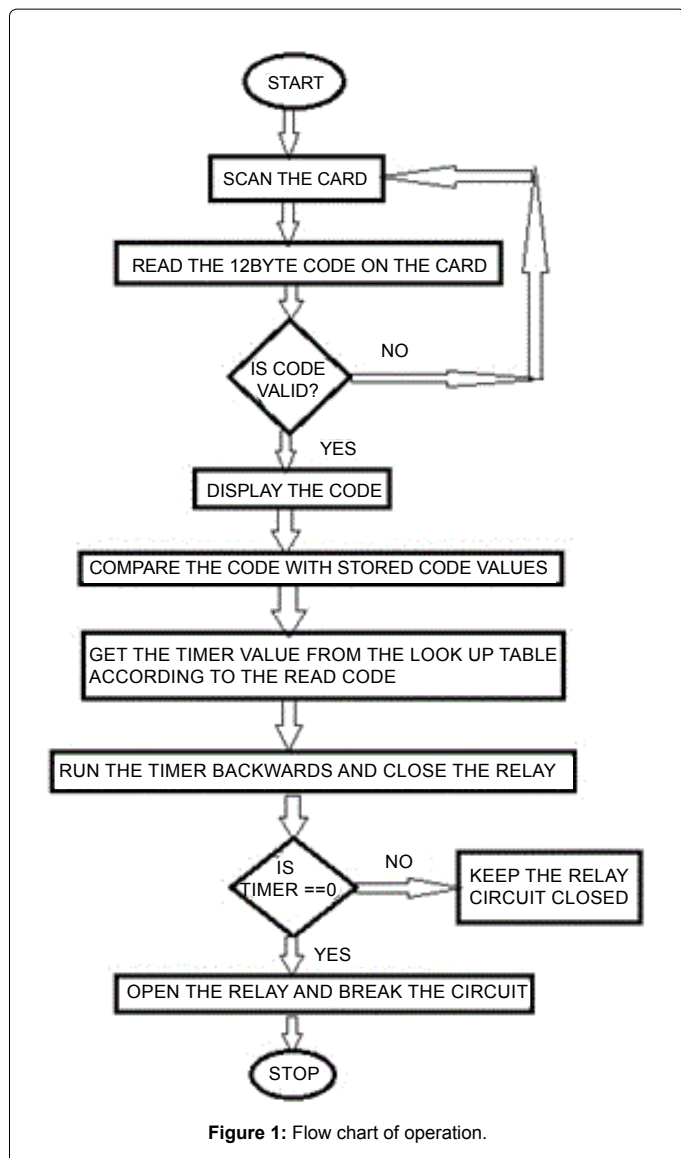
The main obstacle to the spread of RFID in manufacturing is the success of barcodes, the previous generation of auto-ID technology. In most applications, reading barcodes requires human intervention, a clean, high-contrast environment, and often more than one attempt. In addition, not only is the amount of data that can be stored in a bar code is much smaller than in an RFID tag but it cannot be updated. In many

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applications the functional potential of RFID may not yet beat the low cost of barcodes, but it is only a matter of time before it does.

Conclusion

Even though numerous limitations and unresolved issues still hinder the widespread application of RFID. Despite these challenges, RFID continues to make inroads into inventory control systems, and it's only a matter of time before the component costs fall low enough to make RFID an attractive economic proposition. Furthermore, extensive engineering efforts are under way to overcome current technical limitations and to build accurate and reliable tag reading systems.

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

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References

1. Garfinkel S, Holtzman H (2005) Understanding RFID Technology, in RFID: Applications, Security, and Privacy 15-36.
2. Chang KE, Kim HJ, Kim EY (2006) In The Impact of RFID in Retail Industry: Issues and Critical Success Factors Journal of Shopping Center Research.
3. Baudin M, Consultant MMTI- Manufacturing Management and Technology Institute www.wefixfactories.com, Palo Alto, and CA Arun Rao, Baysquare Technologies, www.baysquare.com, Santa Clara, CA RFID applications in manufacturing
4. Kaur M, Sandhu M, Mohan N, Parvinder S (2011) RFID Technology Principles, Advantages, Limitations and Its Applications, Int J Comput Electr Eng 3: 1793-8163.
5. Kumawat A, Chandramore K (2014) Automatic Toll Collection System Using Rfid, Int J Electr ElectroN Res 2: 67-7.
6. Ilie-zudor E, Kemény Z, Egri P, Monostori L(2006) The RFID technology and its current applications In proceedings of The Modern Information Technology in the Innovation Processes of the Industrial Enterprises-MITIP 29-36.