

Vehicles Parking System Using RFID Concept

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Abstract: RFID based vehicles parking technique uses micro controller with sensing circuits which sense entry and outgoing of the vehicles. In this technique the RFID card is swiped with the permission of vehicle's parking owner. The RFID card which are given by the parking owners will be recharged by using the two push switches i.e. SW1 and SW2. When the vehicles enter in the parking system the money will automatically be reduced from the RFID card and it displays on the screen. By using the H bridge concept we operate the entry and exit. In this H bridge concept DC motors are used for the operation of entry and exit boom. The DC motors operate clockwise and anticlockwise as per the program. When the vehicles enter in the parking system the space available in the parking system reduce and vice versa. A standard power supply of 5 volt is given for the operation. An LCD displays all the activities of the parking system.

Keywords: RFID, PIC MICROCONTROLLER, SENSOR, ANTENNA, H-BRIDGE, LCD, LED, DC MOTOR, PHOTODIODE

I. Introduction

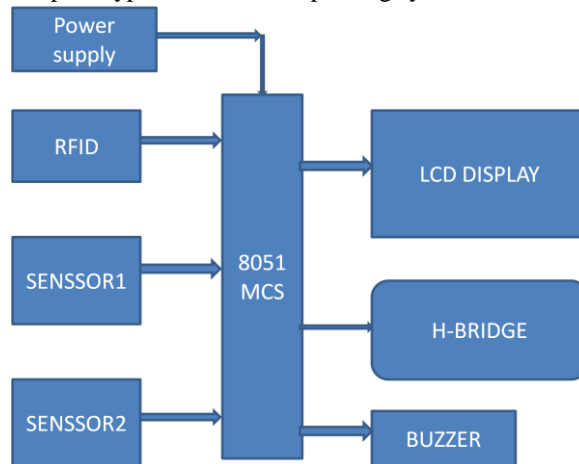
Nowadays Radio frequency identification (RFID) is an automatic identification method in which the data are stored in the RFID tags. This RFID tag is placed inside the vehicles for identification and tracking by using the RF frequency. Now a days this technology are using in the vehicles parking in the shopping centers, buildings, toll plazas for minimizing the chance of traffics well as security purpose of view. This technology is very fruitful in big companies in metropolitan cities for the reduction of chances of traffic jamming etc. This technique uses PIC AT89S52 microcontroller for the purpose of operation. Basically, an RFID system is electronically programmed with unique code and information. The category of RFID system depends on the frequency ranges like low frequency (30-500KHZ), middle frequency (900KHZ-1500MHZ) and high-frequency (2.4GHZ-2.5GHZ).

II. Over View Of The System Framework

RFID systems plays a key role in managing of tracking of signals in the parking area the most important component of an RFID system is RFID tag. The tag is placed inside the body of vehicle which sends information which are observe or read by the reader. The functional characteristics of tags are divided into two modes which are active & passive. In active tag external source is to be given for the operations of the system but in passive no external sources are implied. The RFID reader is placed in the vehicle and the RFID tag is placed in the parking system. The sensor is used to sense the activities of the parking system. A standard power supply (5v) is given. A programed microcontroller (AT89S52) for all the operation of the parking system. An H-bridge is used to operate the entry and exit boom motors operating clockwise and anticlockwise for opening and closing. Two push switches are used for the amount purpose. An LCD is used to display all the activities of the parking system LED is used to produce the light as per the instructions. DC motor is used for the operations of boom in the vehicle parking system. An Antenna is used for receiving and transmitting the RF signals.

III. Prototype Design

Fig.1 shows the prototype of the vehicle parking system which are given below



3.1 RFID

RFID is the term used to describe the system which will transmit the identity of the vehicles . Which contains RFID tag and reader.Each RFID tag will be having unique code which is predefined in the controller and the system validate the code and necessary operation are carried out.

3.2 SENSOR

The sensor is used for sensing the entry and exit of the vehicles from or to the parking system.The sensor operates on the basis of frequency ranges as 125 KHZ to 915 MHZ. Long range sensors are also available and can be used as per the application demand.

3.3 LCD DISPLAY

It is a liquid crystal display,technology used in liquid crystal display.It is made off up array of pixels which is used to convey information.Now a days it is having so many applications in industries as well as in daily human behavior such as LCD TV ,WRIST WATCH,COMPUTER SCREEN,show the information of vehicles entry and exit and shows the train timing on station.16x2 and 20x2 LCDs are mostly used now a days.

LCD BACKGROUND

FOR 11 data lines 8 bit data bus is used for LCD i.e 3 control lines(EN,RS and RW) plus the 8 lines for the data bus .

EN=Enable(shows the information as per the users)

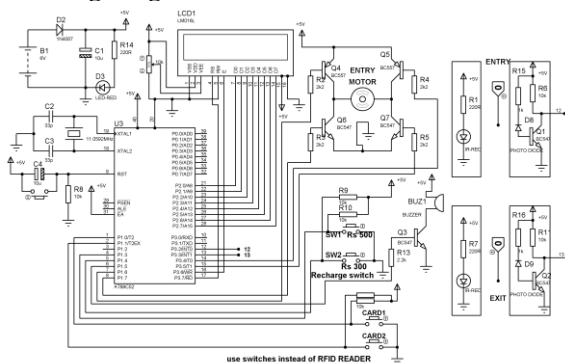
RS=Register select(when RS is low(0),data is treated as command)

R/W=Read /Write

(when RS is high (1), the data is being sent is text data) R/W=Read/Write (When RW is low (0), the data written to the LCD)

(When RW is low (0), the data reading to the LCD)

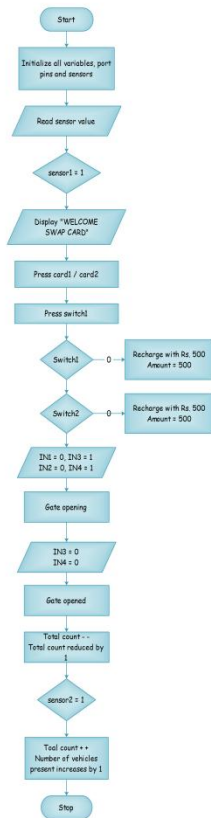
Working Diagram



Working Principle:-

RFID based vehicles parking system works on the principle based on RFID concept. In this the RFID tags are used to read the information of entry and exit of the vehicles. When the vehicles come near the RFID tag the sensor will sense the information by using an RFID reader and send it to the RFID tag. Then, the barrier will open and vehicles enter in the parking and vice-versa.

FLOW CHART:-



TESTING PROCESS:-

Testing process is used for more than two or three vehicles at a time. During the testing state of the parking single vehicle check in and check out process is done. Identification of the vehicles during check in and check out is successfully achieved at the distance depends on the frequency ranges. When the vehicles enter in the parking system the RFID tag reads the coding system and allows the vehicles inside the parking area.

ADVANTAGES OF RFID TECHNOLOGY:-

- 1.No need for physical contact between data carrier and communication device.
- 2.Tags can be used repeatedly .
- 3.Low maintenance cost .
- 4.Switch is used in place of RFID reader

APPLICATIONS

- 1) autonomous sensors.. Military and aerospace embedded software applications
- 2) Communication Applications
- 3) Industrial automation and process control software
- 4) Mastering the complexity of applications.
- 5) Reduction of product design time.
- 6) Real time processing of ever increasing amounts of data.

IV. Conclusions

The RFID parking management system is actual and control the vehicles. This vehicle parking system power consumption can be reduced. It enables user to operate an unattended parking barrier with control parking access. This system is ideal for apartments and condos, gated communities, business parking lots and garages, university parking area. It offers utmost efficiency, convenience, safety and the reliability. It is good solution for today's car parking and reduction of traffic problem.

Acknowledgement

The satisfaction and euphoria that accompany the successful completion of any task would be incomplete without the mentioning of the people whose constant guidance and encouragement made it possible. We take pleasure in presenting before you, our project, which is result of studied blend of both research and knowledge.

We express our earnest gratitude to our internal guide, Assistant Professor Mr. Shailendra Kumar Mishra, Department of ECE, our project guide, for his constant support, encouragement and guidance. We are grateful for his cooperation and his valuable suggestions.

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