

# RFID BASED PARKING SYSTEM

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## ABSTRACT:

Radio Frequency Identification (RFID) technology is widely utilized in various applications such as attendance system, following system, observation system or parking system. Currently, the present parking system uses manual entrance through watchman to access the premise. Therefore, the corporate thought to rent security guard to observe the premise. In addition, the security guards want to screen all motion of car or individual that input or depart the premise. As a result, unauthorized car or individual can without difficulty get admission to the building. To cope with this problem, we proposed a parking gadget using the usage of RFID that could screen car's motion that input or depart the unique place or location through scanning the RFID tag. The potential benefit is it can improve security for both security guards and users. Besides that, this parking system can facilitate access control for users and improve traffic flow during peak period. There are five modules in the proposed parking system which are user registration, vehicle registration, RFID tag, staff and report generation.

## 1. INTRODUCTION

Various technologies have been introduced with the aim of facilitating the user in daily life. This may indirectly improve the productivity and efficiency in solving several matters. Radio Frequency Identification (RFID) is a wireless communication technology that is able to uniquely identify tagged objects or people. RFID systems have been widely used in many applications, such as inventory control, product tracking through manufacturing and assembly, parking lot access and control, container or pallet tracking, Identification (ID) badges and access control,

equipment or personnel tracking in hospitals and others. The aim of this project is to develop an RFID based car parking system. The increasing efficiency of existing manual parking systems and reducing their operation cost by reducing personnel requirement, cost of operation, processing speeds at check-in and check-out etc. This would help in tackling the increasing demand for parking facilities by decreasing capital requirement per car slot. It will also provide a platform for monitoring parking demand at different times of the day. This pattern is useful for future parking planning. RFID uses the electromagnetic fields to transfer data, for the purposes of automatically identifying and tracking tags attached to objects. RFID technology is applied in the Intelligent Transportation Systems (ITS) to monitor the traffic flow and control system for parking. Therefore, staffs have to park their vehicle at their own risk. Besides, this will not ensure that only the authorized person can access the premise. Thus, the security guard plays an important role to make sure only authorized person can access the premise. They need to monitor vehicles or persons movement entering or leaving the premise. As a result, we proposed the parking system using RFID technology to overcome these problems.

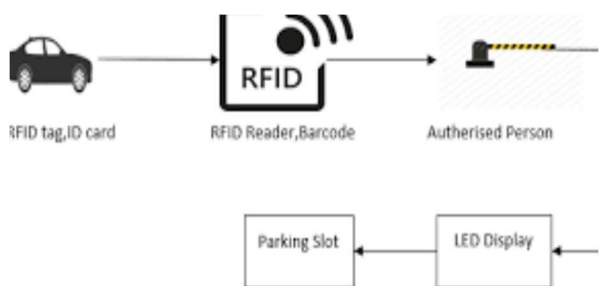
## 2. METHODOLOGY

To design a parking system based on Radio Frequency Identification (RFID) technology, and also develop a parking system that can monitor

vehicle that enter or leaving the premise. To evaluate the proposed parking system in terms of system functionality and usability testing. This project deals with an interesting manner of security access-based car parking system using AT89C51 microcontroller and RFID Technology. Here, only authorised personnel with valid RFID card are allowed access to park.

reprogrammed in-system or by a conventional nonvolatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89C51 is a powerful microcomputer which provides a highly-flexible and cost-effective solution to many embedded control applications.

**PROPOSED SYSTEM**



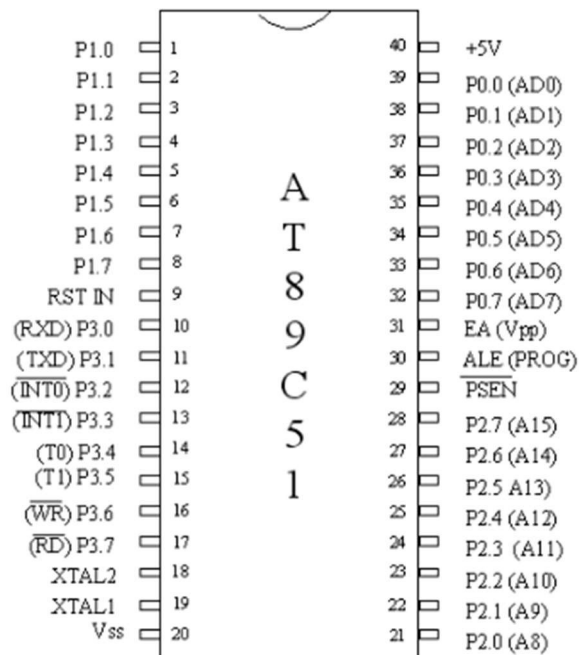
**Fig .1 Block diagram of proposed system**

When the circuit is switched ON, ID card is detected by the reader, a unique card number assigned to every individual, is sent to the microcontroller. If the card number is matched with saved number in microcontroller or database, the LCD screen displays the details of the authorised person and is allocated a parking slot. The entry door here, is programmed with a simple dc motor that rotates clockwise for opening and anticlockwise for closing . If the card which is swiped is not included in the database, then the car is not allowed to park and the lcd reads “ NOT ALLOWED – NO PARKING SLOT”.

**3.HARDWARECOMPONENTS**

**AT89C51 Microcontroller**

The AT89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes of Flash programmable and erasable read only memory (PEROM). The device is manufactured using Atmel’s high-density nonvolatile memory technology and is compatible with the industry-standard MCS-51 instruction set and pinout. The on-chip Flash allows the program memory to be



**11.0592 MHz Quartz Crystal**

Provides a stable clock signal for integrated circuits and stabilizes the frequencies for radio transmitters and receivers.

**20 X 2 LCD Display**

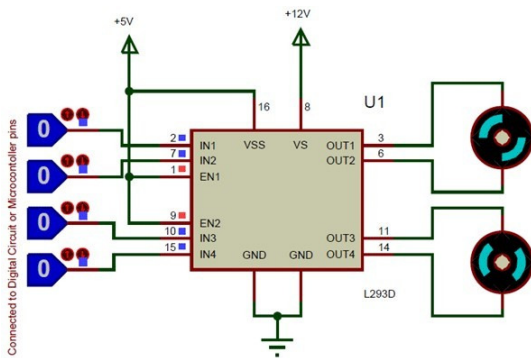


RC2002C is 20 characters x 2 lines monochrome LCD display with module dimension 180.0 x 40.0 mm. Default interface of RC2002C display LCD 20x2 module is 6800 with built-in IC ST7066.

Power supply of RC2002C LCD display 20x2 is 5V .Negative voltage version is available for 3V power supply.

**L293d Driver**

The L293D is a popular 16-Pin Motor Driver IC. As the name suggests it is mainly used to drive motors. A single L293D IC is capable of running two DC motors at the same time; also the direction of these two motors can be controlled independently. So if you have motors which has operating voltage less than 36V and operating current less than 600mA, which are to be controlled by digital circuits like Op-Amp, 555 timers, digital gates or even Microcontrollers like Arduino, PIC, ARM etc.



**Virtual Terminal**

Virtual Terminal is a very useful tool available in the Proteus. With the help of Virtual Terminal one can easily simulate the serial communication that he / she use in his / her embedded systems. It is important to note here that almost every microcontroller that is used in the embedded system has integrated UART (Universal Asynchronous Receiver Transmitter) on it which is used to perform serial communication between other hardware used in embedded system that also supports Universal Asynchronous receiving and transmission. So while writing the code for serial transmission and designing the circuit it is required that the code and design should be tested for serial communication, so that any problem in the code or

communication can be resolved before implementing the circuit physically. It should have come in the reader’s mind that how we can see the data transmitted to or from the microcontroller serial port in the software. Thus the Virtual Terminal plays the role while simulating the embedded systems that compliance the serial communication through the Universal Asynchronous Receiver or Transmitter. The Virtual Terminal in the Proteus is bi-directional which means that it can send and receive data simultaneously.

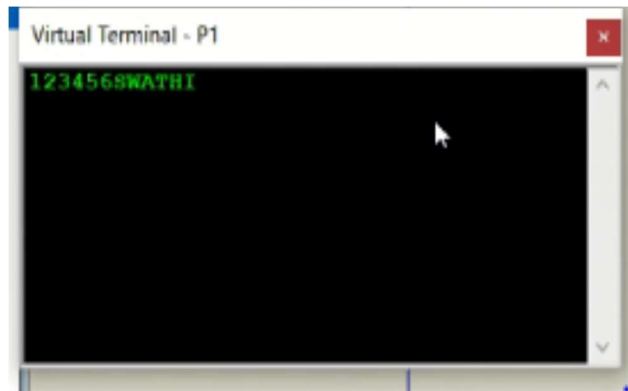
**DC MOTOR**

Actuator for producing movement . The entry door here, is programmed with a simple dc motor that rotates clockwise for opening and anticlockwise for closing .

**4. Results**

**Simulation output**

The result of the proposed system is given below



**5. Conclusion**

In proposed System parking gadgetthe usage of RFID erathat couldscreeencar’s motion that input or depart the uniqueplace or locationthrough scanning the RFID tag. The potential benefit is it can improve security for both security guards and users. Besides that, this parking system can

facilitate access control for users and improve traffic flow during peaks period.

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## 6. REFERENCES

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