DESIGN AND IMPLEMENTATION OF AUTOMATIC TOLL COLLECTION SYSTEM USING RFID

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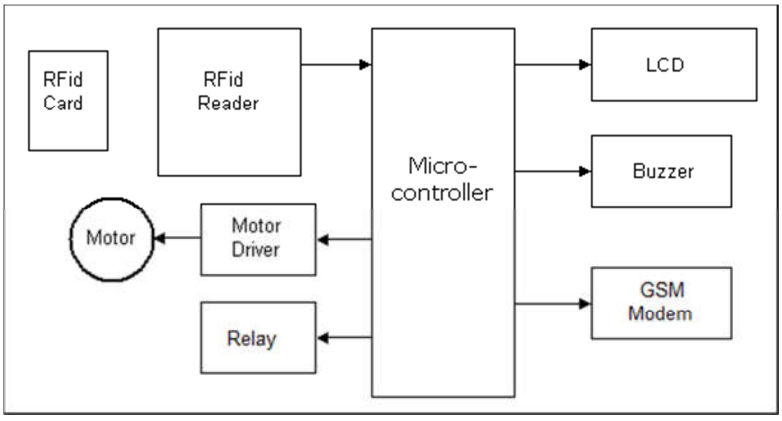
Abstract: In this Paper the main objective is to collect toll fee automatically with the help of access control using RFID whenever vehicle passes toll plaza the toll fee automatically deducted from the user account with help of unique identification number provided to each user. By using this we can reduce human work and decrease the time required to collect the toll fee. It can also reduce the traffic at the toll plaza.

Index Terms: **Infrared Sensor , Radio Frequency Identification, RFID Tag**

1. INTRODUCTION

Now a day's traffic problem is a very severe problem in our country. Every day we must face traffic jam for several hours which is very annoying at the same time creating a huge trouble in our daily life. For the reduction of traffic problem government has made many bridges, fly over's and bypass roads. People must pay toll fee when the vehicles passes toll plaza. But the toll collection system is manual in our country which takes much time to pass the vehicles and creating traffic jam. Here we are introducing Electronic toll collection system using RFID technology which will be an automatic system, will not wait the vehicles at toll plaza as well as this system will help to reduce the traffic jam. Here, the payment will be taken from the bank account of the vehicle owner and he will receive a message from the server that the toll payment has been taken.



Functional Block Diagram.

PROBLEMS WITH TRADITIONAL TOLL COLLECTION SYSTEM

Traditional toll collection system or manual toll collection system is the simplest form of toll collection, in which one or more persons operating from a booth collects the toll fee. This method is slower and its takes time to collect. One or two persons sit in the toll collection booth and stop each vehicle to collect the toll manually. The collector gives a memo to the drivers as a record of toll payment. There is no central controlling system for the toll collection, all the information regarding payments of the vehicles are not saving in a database or website. As a result, corruption is happening, and government is not getting all the toll money properly.

II DESIGN METHODOLOGY

a) Detection of vehicle

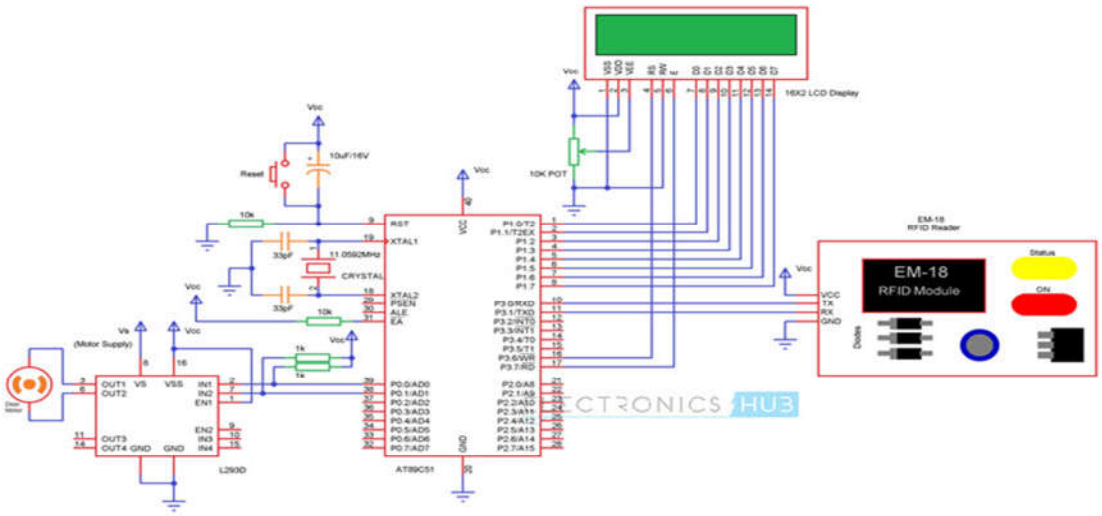
b) Weighing of vehicle

c) Display of toll

d) Payment through RFID card

III. IMPLEMENTATION

Whenever any person buys a vehicle, first he/she need to do their vehicle registration at the RTO office. RTO people will assign a number plate to that vehicle along with it they will give a RFID enabled tag. This card will have a unique ID which is feasible to use with that vehicle only. They will also create an account for that smart card and maintains transaction history in database. Owner of the vehicle needs to deposit some minimum amount to this account. Whenever the registered vehicle approaches the toll booth, first the IR sensors will detect the presence of the vehicle which in turn activate the RFID circuit to read the RFID enable smart card fixed on the windscreen of the vehicle. Transaction will begin, depending upon the balance available toll fee will be deducted directly or the vehicle will be directed towards another lane to pay tax manually. The software further updates the details in the Centralized database server. It also triggers mechanism to generate the bill and will be sent to user as a text message



CIRCUIT DIAGRAM

IV. RESULTS AND DISCUSSIONS

In this paper designed an RFID based security access control system using 8051 microcontrollers, in which only authorized persons are allowed access to a secure area. The working of the project is when the circuit is powered ON, the microcontroller will initially display a message as “Swipe the Card” on the LCD display when the RFID Card or Tag is swiped against the RFID reader, it will detect the ID card and sends the unique card number to the microcontroller via serial terminal with the help of suitable programming, we need to compare the received card number with the numbers that are already stored in the microcontroller or any database like external memory unit. If the received number is matched with the already stored number, then the microcontroller will display the name of the card holder on the LCD and activates the motor driver IC. As a result, the door is opened for a predefined duration after which the door is automatically closed. If there is no match for the received numbers with the stored numbers, then the microcontroller will not open the door and displays a message as “Access Denied” on the LCD display.

CONNECTING MODULE TO SYSTEM FOR DUMPING PROGRAM

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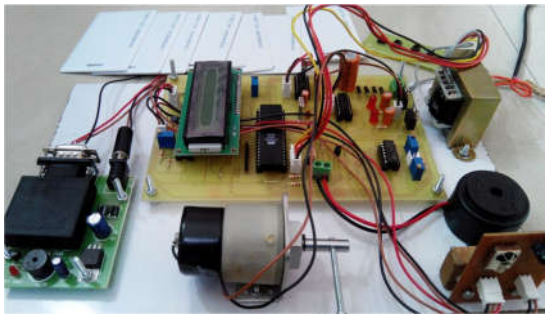
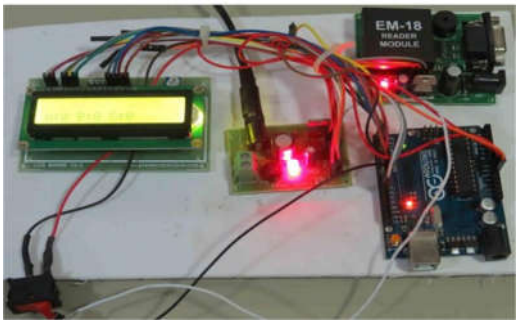
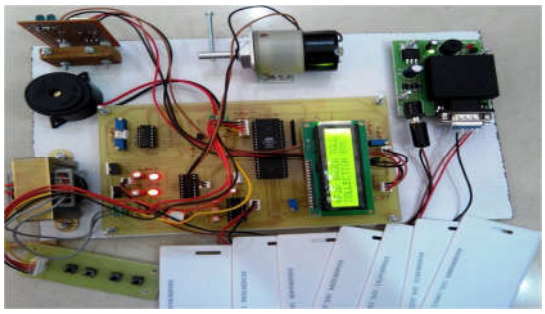
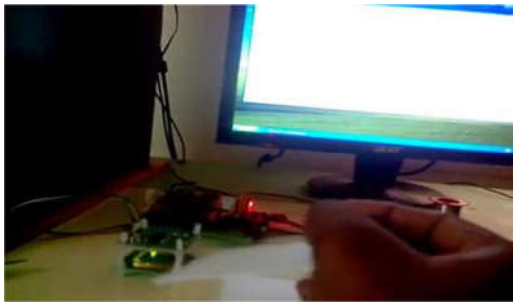
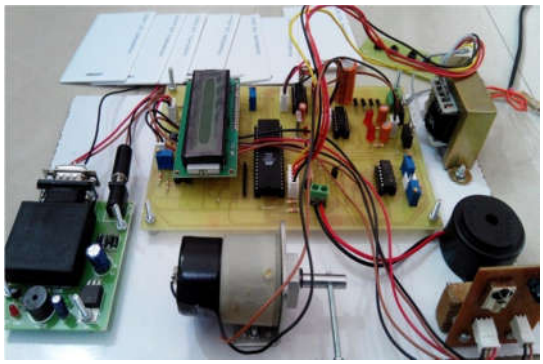


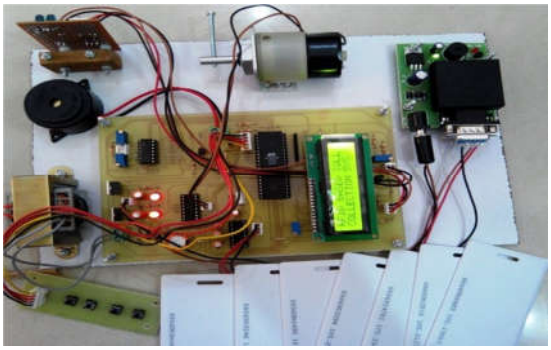








WHEN SYSTEM IS OFF STATE



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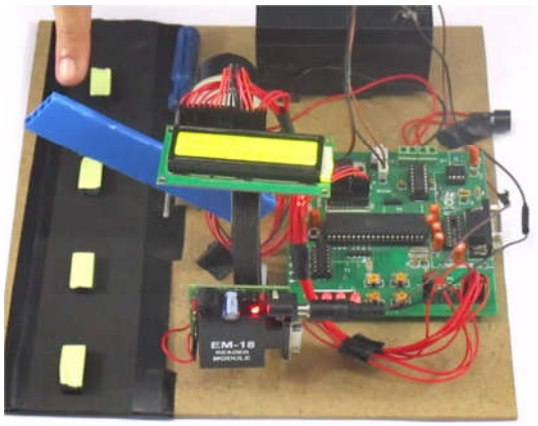
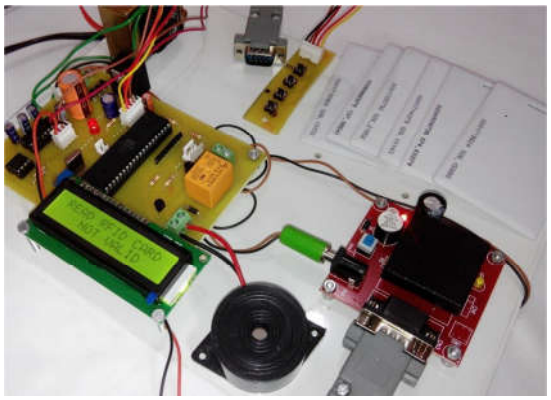


GATE OPEN WHEN ACCESS GRANTED



WHEN ACCESS DENIED

CONCLUSION: In this paper design of automatic toll collection system using RFID is discussed with help Arduino board**.** The Electronic Toll Collection system in expressway based on RFID, a design scheme was put forward. It is low cost, high security, far communication and efficiency, from this I can say that Electronic toll collection system using RFID is an effective measure to reduce management costs and fees, at the same time, greatly reduce noise and pollutant emission of toll station. In the design of the proposed Electronic toll collection (ETC) system, real time toll collection system is designed. This reduces the manual labor and delays that often occur on roads. This system of collecting tolls is ecofriendly and results in increased toll lane capacity.

V.REFERENCES

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