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Automatic Toll Plaza with License Using Adriano Controller

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Abstract: an automatic collection of amount in toll gate using smart card is designed and implemented using rfid technology with the help of driver's license. An added advantage is that, a driver having his/license can only pass through the toll gate. The major problem being heavy traffic at every toll booths in the city can be practically reduced by the introduction of the radio frequency identification based toll tax automation system which makes the toll deduction at the toll plaza's more efficient and perfect.its primary requirement is to wipe out the need for automobilist and toll authorities to manually perform toll gateway payments and toll tax collections, respectively in order to go past the toll booth. The proposed rfid system transmits a unique id code as soon as it reaches near the toll station. On receiving the code, processor checks the received code and compares it with the stored code, if the code matches the gates open else they remain closed disallowing the vehicle to pass. This paper focuses on use of radio frequency identification (rfid) technology for electronic toll collection system. Due to which the problem of traffic congestion and human errors in the system is effectively rectified and provides efficient toll tax collection facility for the consumers at every toll station.

Keywords: rfid, smart card, toll tax automation, license, identification number

I. INTRODUCTION

Embedded system is a dedicated function within a larger mechanical or electrical system.It is embedded as part of a complete device often including hardware and mechanical parts. Embedded systems control many devices in common use today. Embedded systems are designed to do some specific task rather than be a general-purpose computer for multiple tasks. Some also have real-time perform ance constraints that must be met for reasons such as safety and usability. Others may have low or no performancerequirements, allo wing the system hardware to be simplified to reduce cost. Embedded systems range from portable devices such asdigital watches and MP3 players, to large stationary installations like traffic lights,factory controllers, and largely complex systemslike hybrid vehicles, MRI, and avionics. Complexity varies from low, with a single microcontroller chip, to very high with multiple units,peripherals and n etworks mounted inside a large chassis or enclosure.

II. PROPOSED SYSTEM

This approach is used for the vehicle when it reaches the toll plaza this is detected by using infrared sensor. Fuse the identification number using RFID modules into the driver's license.This method is also used to find the validity of license.If anyone a car without having license, or traveling with an expired license, they can't cross the toll gate The automatic toll e-ticketing system is the approach used for the vehicle when it reaches the toll plaza, this is detected by using Infrared Proximity Sensor. RFID tags are used to read each vehicle with the help of RFID reader.

An IR receiver is used to receive these pulses and sends it to a controller, which then transmits the vehicle number through the RF transmitter located in vehicle. We assume that vehicles have 16-bit identification numbers. The RFID tags to readers read the signal and information about vehicles owners. These RF signals are received by an RF receiver at the toll plaza, which send data to a computer's parallel port. A software program running on the computer retrieves vehicle details from its vehicle database. Depending on this information, appropriate toll tax is deducted from the pre-paid account of the vehicle's owners.

The owner receives an SMS message on his/her mobile about the details of the payment. If the balance in the owner's account is low or if the vehicle is not equipped with an RF system, the toll gate remains close. Next method proposes a very simple method for enha ncing the performance of infrared electronic-toll-collection systems, in such a case, the vehicle owner will have to pay the toll tax in case and collect the receipt. We need a system for handling violation and acknowledgement when a vehicle does not have an RFID m odule installed, a vehicle's ID number is not found in the database, or a driver has insufficient funds to pay toll. If an acknowledgeme nt is not received in a predefined time from the database, the toll plaza gate remains closed.

Fig 1.1 shows the block diagram of toll collection consist of a

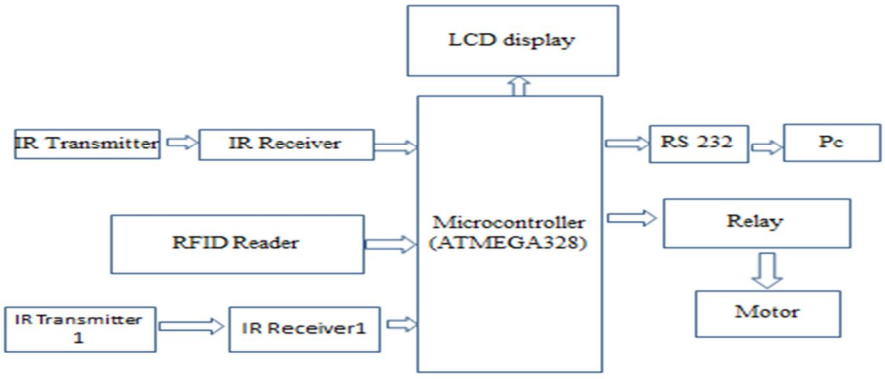

FIG1.1 Block diagram of toll collection

A. Microcontroller(Atmega 328

A microcontroller is a small computer on a single integrated circuit containing a processorcore, memory, and programmable input/out put peripherals. Program well as a typically small amount of RAM. Microcontrollers are designed for embedded applications, incontr ast to the microprocessors used in personal computers or other general purpose applications.

B. RFID

It is an automatic identification method, relying on storing and remotely retrieving data using devices called RFID tags or transponde rs. The technology requires some extent of cooperation of an RFID reader and an RFID tag.An RFID tag is an object that can be appl ied to or incorporated into a product, animal, or person for the purpose of identification and tracking using radio waves.

C. Ir Transmitter And Receiver

The way by which IR transmitter and receiver works is that, one component flashes an infrared Transmitter and receives the signal th at is present in many different devices, as they are most commonly found in consumer electronics devices. Red light in a particul ar Pattern, which another component can pick up and translate into an instruction.

D. RS232

Recommended Standard - 232 is at telecommunication standard for binary serial communications between devices. It supplies the roa dmap for the way devices speak to each other using serial potrs. The devices are commonly referred to as a DTE (Data Terminal Equi pment) and DCE (Data Communications Equipment); for example, a computer and modem, respectively.

E. Dc Motor

A brushless DC motor (BLDC) is a synchronous electric motor which is powered by direct-current electricity (DC) and which has an electronically controlled commutation system, instead of a mechanical commutation system based on brushes. In such motors, curren t and torque, voltage and rpm are linearly related.

F. Relay

A relay is an electrically operated switch. Current flowing through the coil of the relay creates a magnetic filed which attracts a lever and changes the switch contact. Relay allow one circuit which can be completely separate from the first. For example a low voltage b attery circuit can use a relay to switch a 230v AC mains circuit. There is no electrical connection inside the relay between the twocirc uits, the link is magnetic and mechanical.

G. Lcd Display

Liquid crystal display have material,which combine the properties of both liquids and crystals.Rather than have a melting point they have a temperature range within which the molecules are almost as they would be in a liquid but are grouped together in an order fro m similar to crystal.

H. PC

personal computer is fastest electronic calculating machine. Only PC get the binary sequence o and 1

III. SOFTWARE DESCRIPTION

A. Docklight

1) simulating serial protocol docklight can send out user defined sequence according to the protocol used and it can react to incomi ng sequence.this makes it possible to simulate the behaviour of a serial communication device,which is particularly useful for ge nerating test condition that hard to reproduce with the origianl device.

2) logging rs232 data all serial communication data can be logged using two different file formats:useplain text format for fast loggi ng and storing huge amount of data or create a html file with styed text that lets you easily distinguish between incoming and out going data or additional information.

3) detecting specific data sequence: in many test cases you will need to check for a specific sequence with in the rs232 data that ind icates a problem condition. docklight manages a list of data sequences for you and is able to perform user defined action after det ecting a sequence

B. ARDUNIO

The ARDUINO integrated development environment contains a text editor for writing code, a message area, a text console, a toolbar with buttons for common functions and a series of menus. It connects to the arduino and genuine hardware to upload programs and c ommunicative with them.

A program written with the IDE for arduino is called a sketch. These sktechesare written in the text editor and are saved with in the fi le extension. The editor has features for cutting /pasting and for searching/replacing text.

IV. RESULTS

Fig 1.2 shows an output of toll collection,

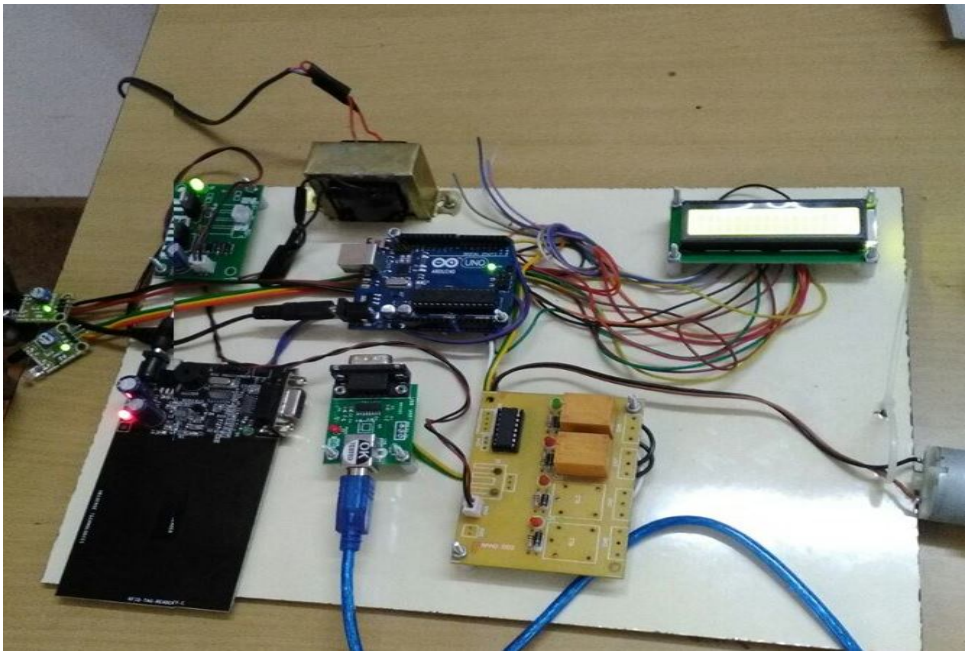

Fig 1.2 overall output of toll collection

V. CONCLUSION

The proposed system is completely digitalized and more efficient to control the traffic at toll plaza so that manual works beingreduce d and no one can cross the toll gate without license.

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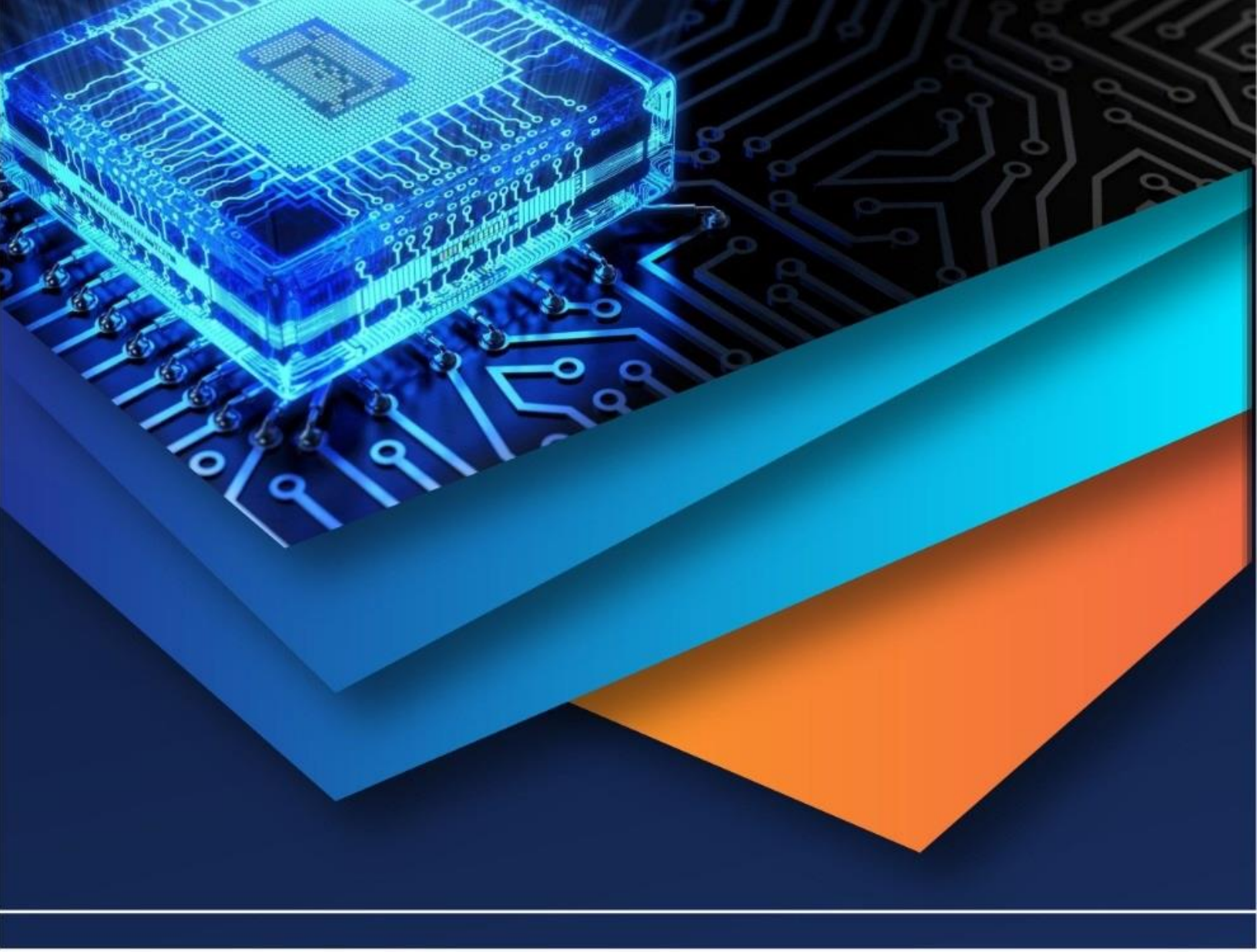

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