

# Theft Vehicle Identification System In Toll Gate By using RFID ,GSM And Visual Basic front end

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## Abstract

The automated toll collection system using Radio Frequency Identification (RFID) tag, GSM, Visual Basic and Embedded System emerges as a convincing solution to the manual toll collection method employed at tollgates and also identify the theft vehicle. Time and efficiency are a matter of priority of present day. In order to overcome the major issues of vehicle congestion and time consumption RFID technology is used. RFID reader fixed at tollgate frame, reads the tag in vehicle. The object detection sensor in the reader detects the approach of the incoming vehicle's tag and toll deduction takes place through a prepaid card assigned to the concerned RFID tag that belongs to the owners' account. This makes tollgate transaction more convenient for the public use .if the vehicle was theft, the owner enrolled the secret number in toll gate data base, the microcontroller compare the secret code with all vehicle and find out the theft vehicle when the theft vehicle cross the toll gate and also GSM send the message (toll gate name and place) to the vehicle owner, this system avoid the 90% of vehicle theft.

**Keywords:** Vb,Arduino,RFID reader , Tag,GSM.

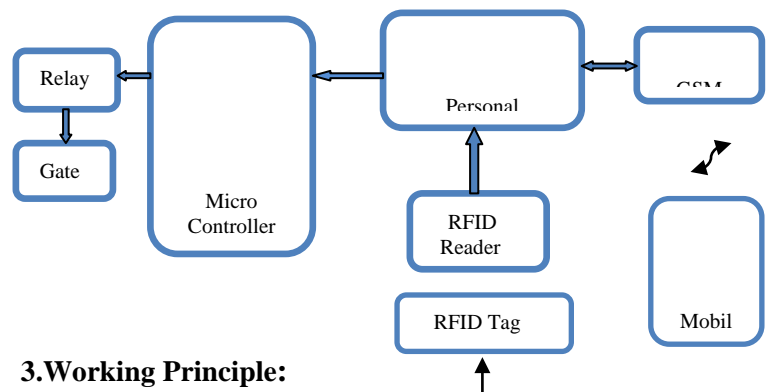
## 1. Introduction

RFID is a wireless non-contact use of radio frequency electromagnetic fields to transfer data for the purposes of automatically identifying and tracking tags attached to the object. The tag contains electronically stored information. Some tags are powered by and read at short ranges via magnetic fields. Others use a local power source such as a battery or else have a no battery but collect energy from the interrogating EM field and then act as a passive transformer to emit microwaves or UHF (Ultra High Frequency) radio waves.

RFID contain at least two parts. An integrated circuit for storing and processing information, modulating and demodulating a radio-frequency (RF) signal,

collects DC power from the incident reader signal, and the other specialized functions; and an antenna for receiving and transmitting the signal. The tag information is stored in a nonvolatile memory. The RFID tag includes either a chip-wired logic or a programmed or programmable data processor for transmission and sensor data, respectively. RFID systems can be classified by the type of tag and reader. a passive reader active tag(ARPT) system has a passive reader which only receives radio signals from active tags. An active reader passive tag (ARPT) system has an active reader, which transmits interrogator signals and also receives authentication replies from passive tags. An active reader active tag (ARAT) system uses active tags awoken with an interrogator signal from the active reader. A variation of this system could also use a battery-assisted passive (BAP) tag which acts like a passive tag but has a small battery to power the tag's return reporting signal. Also the theft detection of vehicles is also possible which is explained as follows.

## 2. Block Diagram



## 3.Working Principle:

It deals two kind of applications.

**FIRST ONE IS AUTOMATIC TOLL COLLECTION & GATE OPEN**

When owner shows the RFID tag in front of RFID reader. The reader gives that particular tag bar code to the toll gate controller software. Here embedded basic visual basic 6.0 coding check the bar code and also vehicle details. That details like owner name, vehicle number plate, account details. Gate was automatically opened after deduct the amount for account .after details the account the remaining amount sent to the owner by sms using GSM. And also indicate low balance to the vehicle owner.

#### **THEFT VEHICLE IDENTIFICATION**

If the vehicle was stolen the owner can inform to toll gate and also informed secret number. When the theft vehicle cross to the toll gate, toll gate controller software indicate the vehicle was theft .after that the toll gate collector ask the unique code to driver. In the unique code was wrong we can catch the theft vehicle and also sent sms for vehicle owner (toll gate name and place).

#### **4. RFID**

##### **principles**

Many types of RFID exist, but at the highest level, we can divide RFID devices into two classes: *active* and *passive*. Active tags require a power source—they're either connected to a powered infrastructure or use energy stored in an integrated battery. In the latter case, a tag's lifetime is limited by the stored energy, balanced against the number of read operations the device must undergo. One example of an active tag is the transponder attached to an aircraft that identifies its national origin. Another example is a LoJack device attached to a car, which incorporates cellular technology and a GPS to locate the car if stolen. However, batteries make the cost, size, and lifetime of active tags impractical for the retail trade. Passive RFID is of interest because the tags don't require batteries or maintenance. The tags also have an indefinite operational life and are small enough to fit into a practical adhesive label. A passive tag consists of three parts: an antenna, a semiconductor chip attached to the antenna, and some form of encapsulation. The tag reader is responsible for powering and communicating with a tag. The tag antenna captures energy and transfers the tag's ID (the tag's chip coordinates this process). The encapsulation maintains the tag's integrity and protects the antenna and chip from environmental conditions or reagents. The encapsulation could be a

small glass vial or a laminar plastic substrate with adhesive on one side to enable easy attachment to goods. Two fundamentally different RFID design approaches exist for transferring power from the reader to the tag: magnetic induction and electromagnetic (EM) wave capture. These two designs take advantage of the EM properties associated with an RF antenna—the *near field* and the *far field*. Both can transfer enough power to a remote tag to sustain its operation—typically between 10 W and 1 mW, depending on the tag type. (For comparison, the nominal power an Intel X Scale processor consumes is approximately 500mW, and an Intel Pentium 4 consumes up to 50 W.) Through various modulation techniques, near- and far-field-based signal scan also transmit and receive data.

##### **RFID card**

RFID cards has diverse range of functions, while provides convenience, as the cards must simply be waived or tapped in front of a reader rather than swiped. These cards are used for applications as access control in security systems, time and attendance, network login security, biometric verification, cashless payment, and even event management.

##### **RFID reader**

An RFID reader is a device that is used to interrogate an RFID tag. The reader has an inbuilt antenna that emits radio waves; the tag responds by sends back its data.

##### **EM-18 (RFID reader module):**

Features:

Operating Distance – 10cm

Operating Voltage – 5V

Operating Frequency – 125 KHz

Current Consumption - <50 mA

This is the stationary Active RFID receiver module situated at the toll plaza. It continuously keeps monitoring for the RFID tags. As soon as the tag comes in the range of the receiver, the buzzer on the module gives an indicative beep and sends the data serially to the microcontroller.

#### **5. GSM module**

##### **(Global System for Mobile communication)**

- ❖ GSM is a digital mobile telephony system.
- ❖ GSM digitizes and compresses data.

- ❖ It gives details about the vehicle owner account balance through SMS .
- ❖ It helps in vehicle tracking .

**Features:**

- ❖ Quad-Band GSM/GPRS 850/ 900/ 1800/ 1900 MHz
- ❖ Built in RS232 Level Converter MAX3232)
- ❖ Configurable baud rate
- ❖ SMA connector with GSM L Type Antenna.
- ❖ Built in SIM Card holder.
- ❖ Built in Network Status LED
- ❖ Inbuilt Powerful TCP/IP protocol stack for internet data transfer over GPRS.
- ❖ Normal operation temperature: -20 °C to +55 °C
- ❖ Input Voltage: 5V-12V DC

**6. Visual basic 6.0**

Visual basic is one of the most popular computer programming languages. It enables programmers to create both stand alone and distributed applications. Being user friendly and interactive, it provides various effective tools to create windows based applications conveniently.

**7. Features**

ATCS is an automatic collection system used for collecting tax automatically. In this we do the identification with the help of radio frequency. Flexibility is the main feature and with the slightest change this can be converted to a completely new implementation. With the help of the latest technology (RFID), the implementation of this project is very simplified. RFID technology together with a very secure database yields into a highly efficient and secure system. Following are the features and advancement of ATCS over presently existing system:

- ❖ RFID tag cannot be cloned, so cannot be cheated.
- ❖ Very efficient in saving time and speedy transport.
- ❖ Wastage of money is reduced.
- ❖ Consumption of fuel is reduced.

- ❖ Less congestion on the roadways.
- ❖ Comparatively less maintenance cost.

**7.sample output**



**8. References**

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