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RFID BASED VEHICLE IDENTIFICATION AND REGISTRATION CERTIFICATE

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ABSTRACT

RFID (Radio Frequency Identification) is one of the emerging technology by using this technology we have many applications which used in present sophisticated life style. In the present paper describe the application is vehicle identification and registration certificate (RC). The information regarding the vehicle and corresponding owner details are stored in the transponder (TAG). TAG is a small card identified by UID (unique identification system) which consisting information electrically when it is in the field of RFID reader the TAG is energised and information is send to the RFID reader. When the vehicle is moves through the police man who is having hand held RFID reader the information is displayed on the monitor of the reader no need to stop the vehicle for verification. We are having low cost RFID readers which are placed in main parts of the city which are used to trace the vehicle and identify the exact location by theft vehicle identification.

Keywords: RFID Reader, TAG, UID (Unique Identification System), Vehicle Registration Certificate (RC)

I.INTRODUCTION

Radio - frequency identification (RFID) is an automatic identification method, relying on Storing and remotely retrieving data using devices called RFID tags or transponders. The technology requires the cooperation of an RFID reader and an RFID tag. An RFID tag is an object that can be applied in to an object for the purpose of identification and tracking. This can be done by using radio waves. Some tags can be read from several meters away and beyond the line of sight of the reader [1].

An RFID tag is an object that can beincorporated into a product, here it is vehicles for the purpose of identification and tracking using radio waves. Smart road checking system is proposed to take off the manual road checking by the police. Now a days there is many road accidents occurs while on road checking. The main reason is the escaping mentality of riders. Sometimes people will have to do unnecessary payments. Tremendous amount of time and power is also wasted due to this type of vehicle checking. Based on the proposed system, the system locks all ways to escape from the checking. As the speed tracking cameras placed near by highways, we implements RFID reader at each police station limits. Also introducing rule that strictly mentions, each vehicle running on the road should have proper RF TAG given while vehicle registration and the vehicles that are registered should get the RF chip fromconcerned department. The system works in such a way that, as the vehicle moves through the RFID reader area, the RF Reader module will read the vehicle ID by scanning the RF chip and the associated computing module will validate the vehicle ID with pre-stored records

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and automatically checking for all certificates validity. If any invalid details found, the system will make alert to the department. So the department can take further actions on the system generated report. Some certificates like pollution, insurance etc. are of short term validity, and those certificateswill have to be updated in the specific periods. For this purpose, as per the proposed system users have to link with corresponding department.

Vehicle thefting has become an ever increasing problem during the last decade and various auto manufactures and researchers have developed and implemented a range of anti-theft security systems for vehicles. The main technology behind this system is active RFID, which has the capability of delivering a unique tagidentification number when the thief is trying to do theft the vehicle moving in the city or out of the city there are some RFID readers placed in the city. The vehicle is near to the RFID reader UID of vehicle is read and identified information is processed.

I1.BLOCK DIAGRAM

The block diagram consisting following blocks

1. RFID Reader
2. Antenna
3. Tags
4. Controller
5. Personal computer

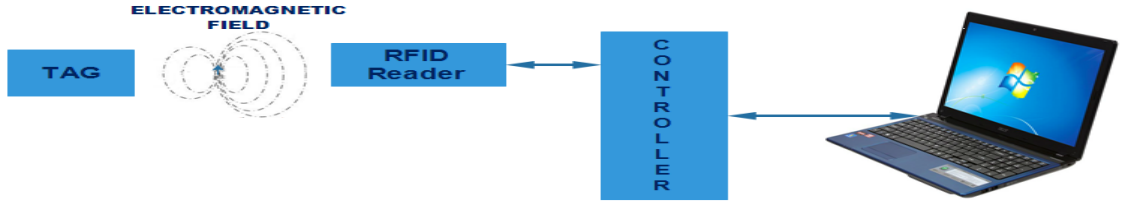

Figure 1: Block Diagram For Rfid Based Vehicle Identification And Registration Certificate

2.1. RFID READER

RFID is a wireless non-contact use of radio frequencyelectromagnetic fields to transfer data for the purposes of automatically identifying and tracking tags attached to the object. The tag contains electronically stored information. Sometags are powered by and read at short rages via magnetic fields. RFID systems canbe classified by the type of tag and reader. a passive reader active tag system has a passive reader which onlyreceives radio signals from active tags. An active readerpassive tag system has an active reader, whichtransmits interrogator signals and also receives authenticationreplies from passive tags. An active reader active tag system uses active tags awoken with an interrogator signalfrom the active reader. A variation of this system could alsouse a battery-assisted passive (BAP) tag which acts like a passive tag but has a small battery to power the tag's returnreporting signal[2].

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2.2. ANTENNA

In RFID Consisting two types of antennas first one is reader antenna and second one is TAG antenna. RFID readers and reader antennas work together to read tags. Reader antennas convert electrical current into electromagnetic waves that are then radiated into space where they can be received by a tag antenna and converted back to electrical current. Just like tag antennas, there is a large variety of reader antennas and optimal antenna selection varies according to the solution's specific application and environment. The two most common antenna types are linear- and circular-polarized antennas[3].

Tag antennas collect energy and channel it to the chip to turn it on. Generally, the larger the tag antenna's area, the more energy it will be able to collect and channel toward the tag chip, and the further read range the tag will have. There is no perfect antenna for all applications. It is the application that defines the antenna specifications. Antennas can be made from a variety of materials; they can be printed, etched, or stamped with conductive ink, or even vapour deposited onto labels.

2.3.TAGS

RFID tags are classified as passive, active or battery-assisted passive. An active tag has an on-board battery and periodically transmits its ID signal. A battery-assisted passive (BAP) has a small battery on board and is activated when in the presence of an RFID reader. A passive tag is cheaper and smaller because it has no battery; instead, the tag uses the radio energy transmitted by the reader. However, to operate a passive tag, it must be illuminated with a power level roughly a thousand times stronger than for signal transmission. That makes a difference in interference and in exposure to radiation [4].

Tags may either be read-only, having a factory-assigned serial number that is used as a key into a database, or may be read/write, where object-specific data can be written into the tag by the system user. Field programmable tags may be write-once, read-multiple; "blank" tags may be written with an electronic product code by the user[5].

RFID tags contain two parts one is integrated circuit which is used to storing and processing information, second one is an antenna for receiving and transmitting the signal. The tag information is stored in a non-volatile memory. The RFID tag includes either fixed or programmable logic for processing the transmission and sensor data, respectively.The tag stores information about registration certificate of vehicle and owner. When it is near the field of reader the information is automatically displayed in the monitor.

2.4. ATMEGA 328P Mirocontroller

The present system atmega328 microcontroller is used to read the data which is read by the RFID reader and process further. Atmega 328 is high-performance Microchip 8-bit AVR RISC-based microcontroller combines 32KB ISP flash memory with read-while-write capabilities, 1KB EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts,serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, 6-channel 10-bit A/D converter[6].

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RFID reader TX line is connected to the RX of atmega328P controller and RX line of reader is connected to the TX of 328P controller. The atmega328p any digital line is used for serial port read and write by software serial command. The serial lines are further connected to the Personal Computer.

2.5.Personal Computer

In the present work we interface the atmega328p serial port to USB of personal computer by using FT232r. The device software as well as application software's are developed successfully these results are displayed on the display unit with graphical user interface (GUI) by using MATLAB. The display panel consisting start button when we press this button reader activated and if tag is in the filed corresponding UID number is placed tag under UID [7].

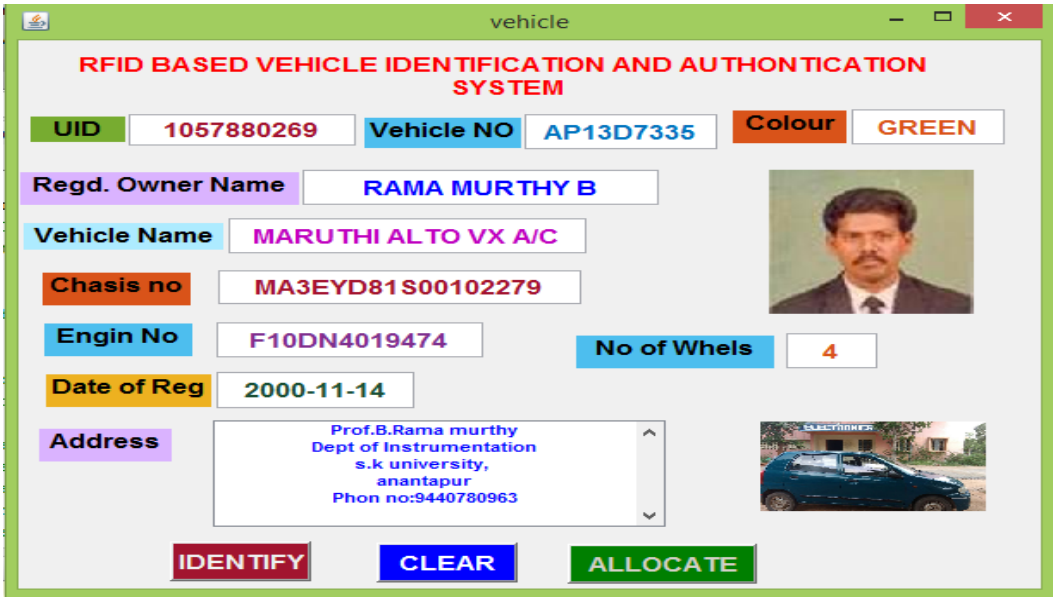

Figure2 : VEHICLE COMES NEAR MF-RFID THE DETAILS DESCRIBED IN THE GUI

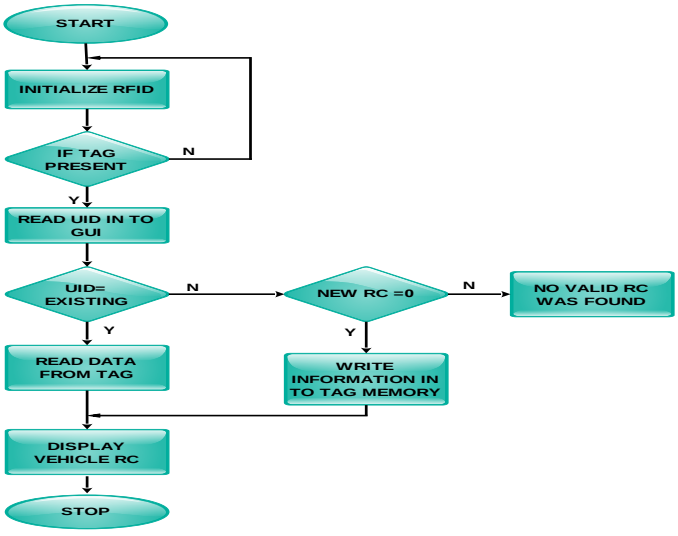

Figure 3: Flowchart for Vehicle Registration And Identification System.

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III. RESULTS AND DISCUSSION

By using the present system, there will be no need to carry RC, tax certificates and other certificates separately if the vehicle is attached with an RFID Tag. This application is helpful to identify vehicles in electronic manner and also if any major accident causes, then information is easily sent or trace out by the police department, which helps them to identify missing vehicle by placing the RFID system in all important routes like in and out places of city. This RFID Reader/Writer also supports the applications in future for automatic toll gate collection, monitor the speed of the vehicle and also tracking. The developed system is being implemented and tested successfully for many times without any deviation in read/write about the information into the Tag. Vehicle Registration and Identification System such as Electronic Registration Certificate (RC). In this application, the information regarding the owner and vehicle along with photos are stored in the Tag. When the Tag is near or within the field of reader, the information regarding the vehicle and the owner are displayed in the GUI developed using MATLAB software.

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