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REAL TIME IMPLEMENTATION OF TWO WHEELER THEFT CONTROL USING RFID, GSM AND ELECTRONIC LOCK

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Abstract— This paper is designed to create a model of motorcycle safety system using Radio Frequency Identification (RFID) and Global System of Communication (GSM) for controllable and improve safety on motorcycles. According to the latest crime rate index, motorcycle theft crime record were high compared with the criminal cases of other types of vehicles such as cars. RFID is a new method in a very efficient security system for smaller areas and limited to a certain distance communication. Basically this system will be detected by an identification tag that was created specifically to these tools while with added some mobile phones and GSM as an intermediate device that connects to a device microcontroller. This system provides the best possible level of safety for motorcycle users from hackers or thieves. It has the sound of the alarm system each time the system is compromised or the occurrence of robbery. Noise will be generated automatically once the user motorcycles will be notified via text message alert messages (SMS) when the events that occurred during the invasion or burglary. An interfacing mobile phone is connected with the microcontroller, which is connected to the RFID reader. This developed system is equipped with additional feature of electronic lock . An electronic lock which locks the rear wheel disables the lock system when the RFID tag is matched with its reader. The proposed module is designed to be compatible with almost all the brands of vehicle.

Keywords— RFID, GSM, Microcontroller, Electronic lock, RFID tag, Security system.

I. INTRODUCTION

The system as the title suggests is aimed to construct a control system that enables the control of the entire vehicle. General objective of the project is to identify co-ordinate vehicle through Short Service (SMS) and effectively lock the rear wheel from moving. The system is to design and develop an advanced bike locking system in the real time environment. A more robust, bicycle theft prevention and recovery system is needed to end this continuing trend. Sometimes we forget to remove the keys from bike by mistake. This project is designed to solve this purpose. Main concept behind this project is of a bike security system using a RFID(Radio Frequency Identification) reader. RFID is a tracking system which uses intelligent bar codes to track items. It reads the data present on the RFID tag and compares it with data present in the microcontroller. If the tag gets matched, there is no issue the ignition will automatically start and run the bike, otherwise the tag will not matched with the original ID ,the user had a alert text message through the mobile phone. GSM (Global System of Communication) an intermediate device that connects to a microcontroller. Overall system is only control on RFID tag , if tag not matched electronic lock enable and ignition not working and relay trip the electronic lock. GSM is a cellular digital system standard phones which are widely used in advanced technology industries. First named after the frequency band around 900 MHz, GSM -900 provide the basis for several other networks using GSM technology, usually GSM networks operating at frequencies band around 1800 MHz and 1900 MHz GSM network technology it has become a largest source of industrial technology for and the communication protocol that allows the transmission of text messages between phone devices and sending short message.

YEAR	AREA	NO OF VEHICLES THEFTED
2015	METTUPALAYAM	31
	PERRUR	13
	POLLACHI	13
	AANAMALAI	3
	SULUR	26
2016	METTUPALAYAM	29
	PERRUR	13
	POLLACHI	24
	AANAMALAI	3
	SULUR	24

II. LITERATURE SURVEY

Table1:Analysis of vehicle theft in coimbatore

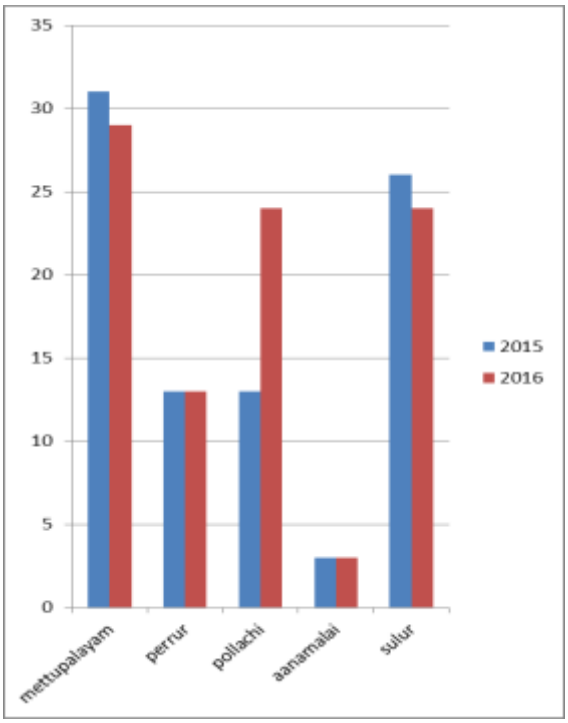


Figure1:Data collected from two theft over past two years

- [1] *Prof. S.O. Dahad***,** has proposed the system which is designed to solve theft . concept behind this project is of a bike security system using a password entered through keypad. This project has GSM technology and Vehicle anti-theft system with vehicle ignition controlling technique. We have provided vibration sensor with this project, which is similar to piezoelectric sensor. When vibrations are detected, SMS is sent to the owner of the vehicle. When vehicle owner sends back sms to project then the engine is stopped. Thus this proposed system is used to prevent the bike theft and identified the location of the vehicle.
- According to [2] *L.Wan* a security system is essential for motorist now a days as the number of motorcycle theft increases every year. Various security system are available in the market with variety of function, operating modes and features. Most of the systems are expensive which the motorcyclists could not afford to have a security system. Fingerprint based security system is most secured system as compared

to other systems. However thumbnail of every human being is unique, so lock will not open unless the same person is present

- to give the impression of fingerprint. No need to carry the keys to open the lock .Or even there is no need to remember the password or any pin number. there is a disadvantage in both scenario(keyword and fingerprint) .
- [3]Manjusha Patiletal Created a project of Wireless Sensor Network and RFID for Smart Parking System. They did some research and conclude that RFID and WSN is the best solution for this project to recently turned to applying technologies for organization of parking area. It is realized that this simple development could be applied to monitor and handle vehicles parking. System will inform the user which means drivers about the situation of the parking area is available and which area should the driver should be direct to. This kind of system helps to minimize traffic congestion problems and driver's frustration while finding a vacant space in a crowded parking garage.
- [4]N. Suthanthira Vanitha, et al, created the Vehicle Tracking and Locking System Based on GSM and GPS stated that the GSM modem is a specialized type of modem that accepts SIM cards on mobile numbers of customers through a network, such as mobile phones. MAX232 logic is used to convert TTL logic levels to RS232 converter which is usually used between the microcontroller and the board GSM.GSM Modem is the RS232-compatible logic because it takes-3V to-15V logic high and +3 v to +15 as low. The signal at pin 11 micro-controller sent to GSM modem through max232 pin 11 signal. It is a cell phone without a display.
- [5]K. Sushma et al, created and designed reservations Based RFID Vehicle Parking System Using GSM and RFID technology. Radio frequency identification (RFID) is an automatic identification method where there is information stored in the RFID tag. The RFID tag is a device to recognize and locate the desired items by using radio waves. Tags can be detected from several meters away. This tag consists of electronically stored information data which can be read up to several meters away. RFID system has three major components of tags. One is used for transponders, then, RFID reader is used for transceiver and third, protocol set used for the information transmitted.

III. EXTRACTING KNOWLEGDE FROM EXISTING METHODOLOGY

RFID is coming into an increasing wide use in the industry as an alternative type to the bar code preference. Furthermore, radio frequency identifier (RFID) is also a generic term which is currently used to describe a system that transmits the identity of an object or person wirelessly, that is by using radio waves. It falls into the broad category of automatic identification technologies. Bar codes are frequently seen as a single word, consists of Barcode small lines (bars) and spaces affixed to retail store items, identification cards, and postal mail to identify a number of specific product, person, or location. This code uses a sequence of vertical bars and spaces to represent numbers and other symbols too. One final disadvantage of keyless bike lock is that electrically-powered systems may not function properly in the case of a power failure. This can leave your bike completely locked throughout the failure, or it may result in the bike not locking properly and remaining open. When the bike is in lock state for about 3 to 4 weeks ,the battery gets drained completely and hence the security system is in shutdown condition. The bike will not get ignited until the battery gets charged.

IV. PROPOSED METHODOLOGY

In this method introducing a RFID tag based security system in two wheeler. A RFID is generic term of technologies that use radio to automatically identify people or objects. RFID reader is device that is used to interrogate an RFID tag the readers the PIC address. GSM is a digital wireless telephony technology .It digitizes and compresses data then sends to the user.PIC is a controller that separate code and data spaces for the other devices. System is totally secure when in the Secure Mode. Firstly, the system will check either the system receive the ID number from the RFID reader or not. If ID number received, system will compare it with the preprogram ID number. If the number matched than the secure mode will be deactivated and user can used the motorcycle as usual. But if number does not match, the system will trigger an alarm and the owner will be automatically informed via mobile phone.

General Block Diagram

Figure 2 show the final circuit diagram that was used in this system. This circuit diagram was draw by using Proteus software. After simulation, it was build using actual electronic component. This circuit have been test by using a several method and referring to data sheet of all components to complete the whole connections after testing of this system.

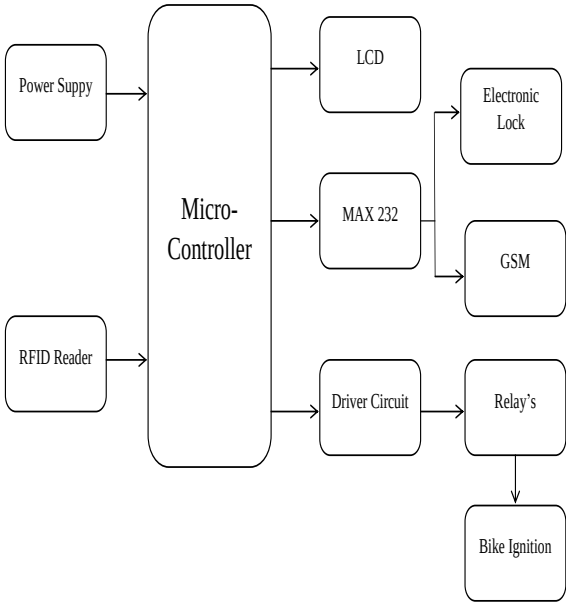
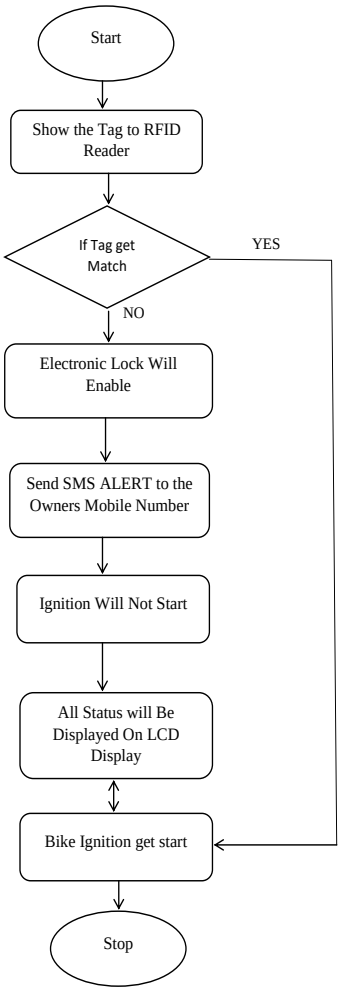


Fig2 schematic diagram of the system

BASIC FUNCTIONS

- RFID reader detects the signal from RFID tag
- If tag matches the relay switch will be opened and ignition with electronic lock will be enabled
- If signal mismatch an alert message will be sent to the user using GSM technology.
- Electronic will not be enable and locks the rotation of the two wheeler.

V. WORKING DESCRIPTION



VI. RESULTS AND DISCUSSION

This security system is successfully built to have a two way communication with the user .If the motor cycle is intruded by someone the system will automatically sends SMS to the user .The user will receive the SMS as shown in the Fig. If the condition failed from the module the LCD displays that it's a unauthorized access .In his condition the user will be informed by a SMS from the GSM modem and and module produce the alarm sound until the user produces the original tag. This systems main point is to reach the objective as a security system. The GSM modem is connected to the arduino microcontroller via rs232 serial to microcontroller circuit. There are two types of RFID tags, passive tag and active tag. This type of tag has a different specification of their attributes; passive tag

did not have a battery as a power source to operate because energy transferred from this passive tag type is using the radio frequency from reader, which mean it required a signal strength to tag from RFID reader. Reader will send out the radio frequency signal to RFID tag for range of detection, passive tag usually less only detect up to 5 or 9 cm of their range detection attach to reader. Second type of RFID tag is active tag, active tag required a battery as a power supply to operate which mean this type need a power supply to recognize a RFID reader as their operation. Active tag is required very low signal strength to tag because these types of tag have their own power supply and about range of detection active tag is much better than passive tag it is because range of detection up to 100m. As a discussion of this project, passive tag is suitable for this type of security because it required a range than the system needed if using an active tag for this type of security it not suitable because it required a long range to detect and it cannot guarantee for safety of motorcycle.

Fig.3 Basic LCD display when bike start

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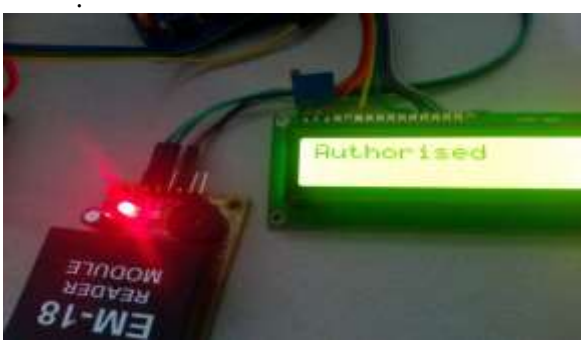

Fig.4 when the bike owner access RFID tag

Figure6: When unauthorized person access the tag

VII. CONCLUSION

This paper discuss the motor cycle security system using RFID and GSM technology as a main control security system .This system is implemented using arduino which is programmed with c language .The system was effectively built and tested as specified by the objective. The ability of system is to analyze the RFID tag and send SMS. RFID is coming into an increasing wide use in the industry as an alternative type to the bar code preference. Furthermore, radio frequency identifier (RFID) is also a generic term which is currently used to describe a system that transmits the identity of an object or person wirelessly, that is by using radio waves. The purpose of this paper is to build an increase security system for motorcycle using a Radio Frequency Identification (RFID) and also Global System for Communication (GSM)

VIII. ACKNOWLEDGEMENT

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