Smart Bike Security System using Arduino

[1]Ms.Raheela A. Patel, [2]Ms.Alfiya I. Peerzade, [3]Ms.Geetanjali A. Donta, [4]Ms.Analratna G. Gaikwad,

[5]Prof.Ms. Sheetal C. Savalgi

Shri Siddheshwar Women's Polytechnic, Solapur, Maharashtra, India.

Abstract: - *The proposed system is "Smart Bike Security System" is designed to protect the bike or other vehicle from theft this system provides physical security to bike through pin it will total key less bike. Also the location tracking app is developed that will captures the location of the bike from the GPS attached to the bike.*

Keywords: - *Arduino AT Mega 328, GSM, GPS, Relay, Jumpers, Security*.

1. INTRODUCTION

The System we proposed is "Smart Bike Security System" this system is designed to provide basic security to the bike. This system doesn't require key if embedded in bike user should to enter pin. For tracking the user should to be registered on that app and then user can track his/her bike through this app. This information is secured because the location is sent only to the owner cell phone that the number is stored on GSM module. Bike is secured also if number of peoples pulled up the bike. That the complete security is provided to the bike if someone crack the pin then also owner can the bike lock remotely.

2. EXISTING SYSTEM

Variety of security systems is available in market that has the various functionality, operating principles. That the proposed system is that has features as it uses GPS for location tracking. And has the sensors that will on the buzzer if someone touches to your vehicle and it has remote controlled key that we can lock it. The existing system is not cost effective that it requires number of modules to handle these all functionality. The existing system has the speedometers that are available only in luxury cars that makes the system not affordable. If the speedometer get damaged then we have to change the mechanical worm gear and cable that is complex one.

3. PROPOSED SYSTEM

The proposed system is "Smart Bike Security System" that is developed to reduce the theft this system engages the total key less bike feature that the owner need not to have the key for using the bike owner should to remember the 4 digit pin to use the bike until and unless the pin is not entered the bike will not start. If someone enters wrong pin for three trials it will on the buzzer to inform the security personal about theft and also the owner get the SMS that "Some One Stealing Your Bike" that owner get informed and reach to the bike. Until the right pin is not entered the buzzer will remain on.

For the location tracking we have developed "Tracking App" this app will provide the accurate and current location of your bike. We also added the feature that you can also find out the history of your bike that where was your bike before one hour or one day. For this you need to provide the ID of your bike to the app. That it will match it with database stored on server and provide the location on your cell phone.

We also added the feature as if your bike has change in its location that without your information you can send "off" command to your bike that your bike get lock automatically.

And also we have fitted distance sensor at the bottom of the bike that if number of peoples came and the pulled up the bike then the security provided to the bike has no mean that to avoid this problem the sensor will sense the bike distance from land if it is more than one feat then it will on the buzzer and also send SMS to the owner of the bike that "Your Bike has a motion". This system is cost effective because we are using the micro-controller that has less cost as 425.99 Rs only.

3.1 OBJECTIVES

- To reduce the man power required for the security.
- To get exact location of the vehicles.
- To reduce the theft.
- To control vehicle through Short Message Service (SMS).

3.2 SCOPE

In future there is no doubt, that all of the vehicle will be embedded with this System. In addition to pin we can also add extra future like thumb\face \voice recognition to ascertain more security of the vehicle. Ideally this system could be made more convenient and secure with the use of satellite modems instead of GPS as tracking device as the system may fail when there is no network coverage area.

4. ARCHITECTURE

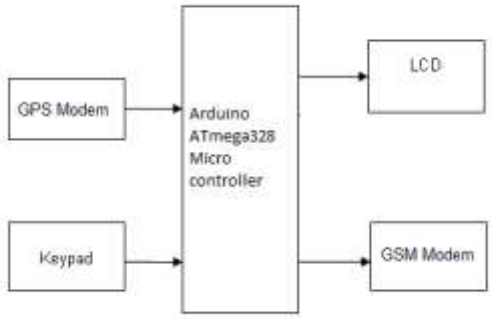

Fig. Architecture

As shown in above figure the Arduino ATMega 328 is a micro-controller that is used here to handle all the other peripherals connected to it like GSM, GPS, Keypad, LCD, etc.

The flow of the system is that the LCD will display message please enter pin. Keypad is used to enter pin this pin will send to micro-controller for comparison if pin matches it will start bike. If pin goes wrong for three trails then it will on the buzzer and also control transfers to GSM to send SMS and GPS will send location to the micro-controller that it will pass location to GSM. GSM uploads this data to server and server will provides location on the Tracking app.Same for the off command when send to micro-controller through GSM and micro-controller then send the command to stop the bike to the relay. And relay will stop the bike.

5. SOFTWARE REQUIREMENT

Arduino IDE v.1.0.5

Arduino is open source software. It has functions to be upload the code on micro-controller. This IDE has inbuilt code for GSM, WiFi, Keypad, etc. It has inbuilt libraries. For different modules that we implement on it requires libraries to be installed on it explicitly.

6. HARDWARE REQUIREMENT

6.1 Arduino ATMega 328

Fig.6.1. Arduino ATmega 328

Arduino ATMega is micro-controller is same as small CPU it has 16 MHz of processing speed. It is 8 bit core processor. Operates on 5 volts power supply. It has 32 kilo bytes of flash memory and 2 kilo bytes of RAM.

6.2 GPS

Fig.6.2.GPS

The Global Positioning System (GPS) is a satellite-based navigation system made up of at least 24 satellites. GPS works in any weather conditions, anywhere in the world, 24 hours a day, with no subscription fees or setup charges. The U.S. Department of Defence (USDOD) originally put the satellites into orbit for military use, but they were made available for civilian use in the 1980s.

6.3 GSM

Fig.6.3. GSM

GSM (Global System for Mobile communication) is a digital mobile telephony system that is widely used

in Europe and other parts of the world. **GSM** uses a variation of time division multiple access (TDMA) and is the most widely used of the three digital wireless telephony technologies (TDMA, **GSM**, and CDMA).

6.4. Relay

Fig6.4. . Relay

A **relay** is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid-state relays. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

6.5 Jumper

Fig.6.5. Jumper

Jumpers allow the computer to close an electrical circuit, allowing the electricity to flow certain sections of the circuit board. Jumpers consist of a set of small pins that can be covered with a small plastic box (**jumper block**) as shown in the illustration to the right.

7. APPLICATIONS

- Door Locking.
- Vehicle tracking.
- Server rooms.
- Lockers

8. ADVANTAGES

- Theft are reduced.
- Location of the bike is provided to the owner after fixed time interval.
- Buzzer will inform a security personal as well as send SMS to owner to inform about theft.
- If change in position of the bike is detected the owner can send SMS and lock bike.

9. CONCLUSION

Applicable for the all transport vehicles to track the root of buses. New technology that makes the life simple and also secures our vehicles. This system is cost effective if you embed this system in bike that makes the bike secure. This provide the basic security to the bike as it uses pin as a key that the key is not required. Due to the features we added like tracking app for location tracking it will provide the accurate location. Features like distance sensors and the relay switches improves the secure your bike if it number of thieves tries to stole your bike. This system can be embedded to the other vehicles also. Other appliances such as lockers can be secured by this system.

10. ACKNOWLEDGEMENT

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