Car locking/unlocking and remote vehicle shutdown by android through IoT

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Abstract- *Increasing the vehicle security and making advancements in current technologies are main concerns in automotive industries. People face difficulties in locking/unlocking the car when losing the car keys. So to tackle this problem, an embedded system can be designed and implemented in car which can be locked & unlocked with the help of smartphone. For enhancing the anti-theft technologies, the remote vehicle technology can be also implemented in a real car with the help of embedded system. This Paper shows the function of controlling car doors and remote vehicle shutdown by android with the help of IoT.*

I. INTRODUCTION

In the age of digitalization, almost everybody use a smart device which helps making our lives simpler and smarter. The main objective of innovative and advance technologies is to reduce the human effort as much as possible.

Taking this idea of information in our vehicles with the use of IoT (interet of things) which has a vast future scope. Imagine the unlocking or locking car by smartphone from long distance or having your car stolen and cops using remote vehicle shutdown technology to find your car and cut off the engine and get your car back. This is the type of future we want to have where technology makes your life easy and secure.

Car locking and unlocking by smartphone will come true with the help of a Wi-Fi chip ESP8266 which is integrated with Microcontroller NodeMCU V2, Car Locking Kit with simple microcontroller coding and an application as an interface. For Remote vehicle shutdown, the ignition system can be turned off with the help of microcontroller.

II. LITERATURE SURVEY

The literature survey section consisted of a thorough review of published literature concerning remote vehicle shutdown technology and Central locking system via smartphone.

The proposed system will be a great advantage in terms of human energy and time consuming. This proposed system will be low cost and more secure then other locking systems. It can be developed to get an easy access our car i.e. to unlock and lock car doors with the help of smartphone so that people do not have to carry their keys with them all the time.

If a car gets stolen and used for any illegal activities then car owner will face legal troubles. For this issues car locking and unlocking by smartphone provides car security. By any chances car gets stolen remote vehicle shutdown technology helps in finding out the car. Remote Vehicle shutdown is the security after the car gets stolen.

Mrunal, Sagar and Mona describes the locking and unlocking of car by Bluetooth technology. They used Bluetooth signals for locking or unlocking function by smartphone but range of Bluetooth is very low which is a disadvantage of this project. Ranvir, Sunil and Nadaf [3] presented the idea of remote vehicle shutdown but for different use. They stated that this technology can be used for stopping vehicle ramming attacks done by terrorists. From this paper we came to know that Vehicle tracking system is a vital system which helps Vehicle shutdown techonology.

III. PROPOSED SYSTEM

An electronic system for Car locking/unlocking and Remote vehicle shutdown system has following objectives:
- Locking of Car by sending signal from the smartphone to the microcontroller.
- Unlocking of Car by sending signal form the Smartphone to the microcontroller.
- Remote vehicle shutdown or Engine Power Cut off from anywhere by sending signals to microcontroller when car gets stolen.

The system is developed using the following components:

Hardware:
- Microcontroller
- Relays
- Wi-Fi Chip ESP8266
- Central door lock circuit

- Ignition System
- GPS module

Software:

- Arduino IDE
- Android Studio

Hardware Components:

Microcontroller (NodeMCU with ESP8266 Wi-Fi Chip):

NodeMCU is the microcontroller used in this project. ESP8266 Wi-Fi microcontroller which is in-built in the microcontroller. The Arduino IDE is the platform used for the coding of Microcontroller. It uses the USB power supply. It is single-board microcontroller.
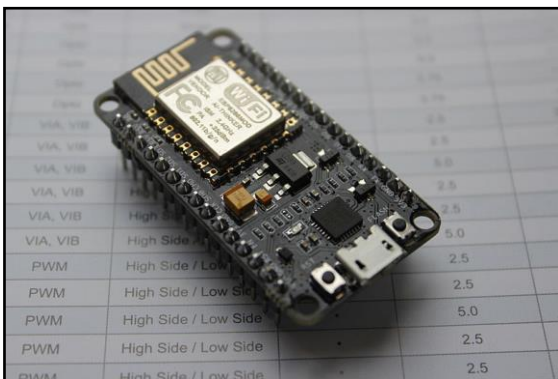

Figure-1 NodeMCU ESP8266

Relays:

Relays are the switches that open and close electronically. In this project 4 channel relay is used which is operated at 5V DC power supply. It can be directly controlled by the microcontroller.
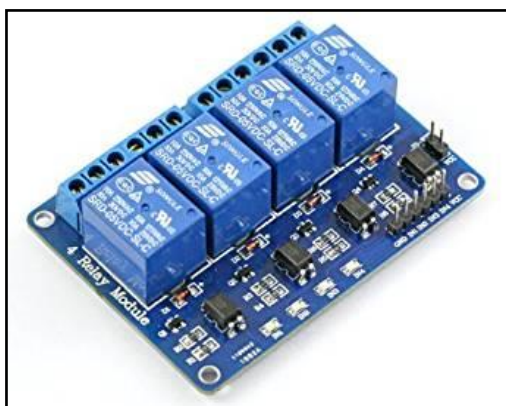

Figure-2 4 channel relay

Car Locking Circuit(Actuator):

In car locking circuit, the actuators are used. These actuators are connected to the microcontroller with the help of wires. Actuator receives signal from the microcontroller and then open or close according to it. The actuator works on 12V DC supply.
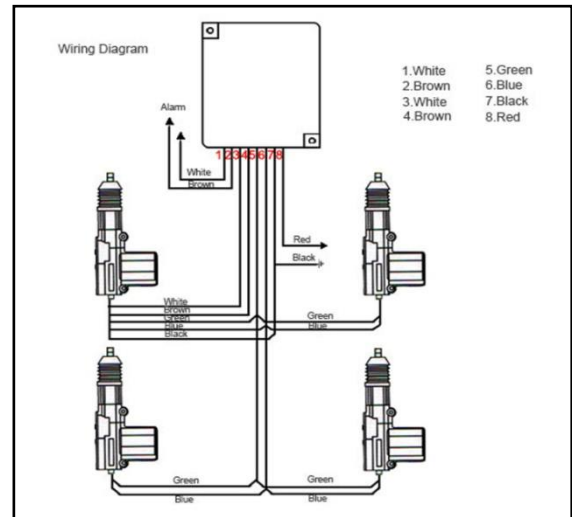

Figure-3 Car locking Circuit

Ignition Circuit:

Engine ON/OFF and remote vehicle shutdown can be done by the controlling Ignition system. Ignition system can be turned ON or OFF by stopping power supply from the battery. So the Engine can be start and stop by the smartphone which sends signal to the microcontroller which will cut off battery power supply to ignition system.
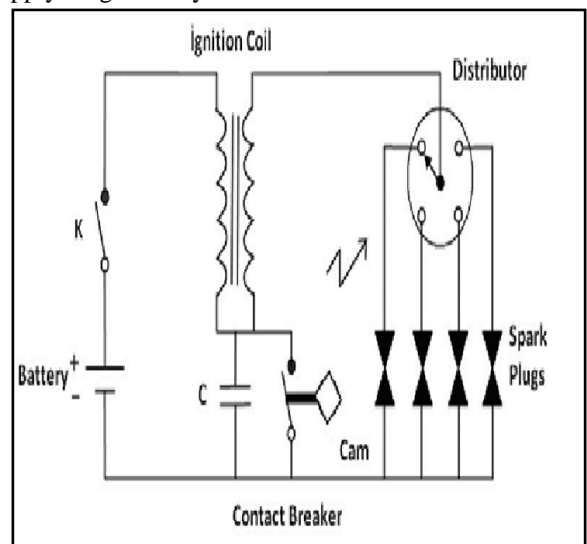

Figure-4 Ignition System

Software:

Arduino IDE:

Arduino IDE is an open source platform for coding microcontrollers of arduino like uno, mega, NodeMCU etc. In this project Arduino IDE is used in coding of NodeMCU ESP8266.

Android Studio:

Android studio is an open source platform for coding of android applications.

IV. CONCLUSION

IoT based automotive door locking system with applications which can be developed for android . A prototype was successfully implemented by which parameters of a vehicle were monitored and controlled & also provides the remote control for the user by using smartphones. The designed system will provide total security to the car and ease to the user. The main objective of this project is to eliminate the car key. Also we would include Remote Vehicle Shutdown in our project to manually shut down the engine during a situation of theft which can be used by the Government/Rto but keeping in mind it can only be used when the stolen vehicle is in sight.

FUTURE SCOPE

This project can be termed as the first step of autonomous car. The use of IoT devices is really increasing at present. Advancement can be done to control other car systems like power windows, music system and other features. Remote vehicle shutdown is a security feature which can be used in Automobiles.

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