THEFT PROTECTION SYSTEM FOR VEHICLE

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ABSTRACT

An embedded system combined with the Global Positioning System (GPS), Global System for Mobile Communication (GSM), Relay Module, and Microcontroller is used to build effective car security for antitheft. This project aims to design and construct a smart antitheft system that makes use of GPS, GSM, a relay switch, and a microcontroller system to prevent theft and determine the exact location of the vehicle. GPS GSM module, Node-MCU microcontroller, and Relay switch are all part of the system. The GPS system will track the vehicle's present location, and GSM will be utilised to relay the information to the vehicle's owner. The mobile application can be used to perform preventive measures such as engine ignition cutoff after parking the vehicle using a relay switch and microcontroller that will be installed in the vehicle. The vehicle can be totally controlled using our mobile application. This entire system was created with low-range vehicles in mind in order to offer them with maximum security.

Keywords: Global Positioning System, Relay Switch, Node-Mcu Microcontroller.

I.   INTRODUCTION

As the number of car robberies is higher than it has ever been, it has become critical to provide a vehicle with the most effective anti-burglary device. The easiest way to protect your vehicle from various types of burglaries is to use a vehicle locking system. It is a car security device that provides excellent vehicle insurance. However, in the event of a break-in, this system was unable to demonstrate that it provided complete security and openness to the vehicle. As a result, a more developed framework takes use of an inserted framework centered on a GSM Microcontroller and a Relay Switch. The vehicle receives the outlined and constructed framework Vehicle Tracking System (VTS) is an answer for locating, tracking, and securing your moveable resources, whether you have a single vehicle or a fleet of thousands. It's designed to keep track of and report on your vehicle(s) in real time, no matter where they're parked. After turning on the motor, the engine cannot be restarted without the approval of the watchword. This framework was designed for two-wheelers. An android application will be used to operate the vehicle; the user will be able to turn off the vehicle's ignition switch, which will be connected through relay switch and microcontroller, as well as track the vehicle's exact location using the android application. This system is based on the Internet of Things. IOT refers to a network of interconnected devices that are equipped with software, network connectivity, and appropriate electronics to gather and exchange data, allowing them to be responsive.

II.   METHODOLOGY

Theft protection for automotive security is divided into two parts: the application and the hardware, which includes GSM modules, GPS modules, node MCU microcontrollers, and relay switches. Hardware will be installed in the two-wheeler vehicle, which will be connected to the mobile application and controlled entirely through the mobile application. This mobile app will be extremely user-friendly. In the mobile application, the user must first register his or her personal information as well as the vehicle's information. The user can register several vehicles on the app, and the user can also follow the vehicle's location while on the road. The application will also include a map element. The application will have a relay button that will be connected to the Node MCU microcontroller and the Relay Switch; if the user activates the Relay Switch using the application, the vehicle's ignition will be turned off until the user turns off the Relay Switch; this is the main feature of the theft protection system.

Hardware Description:

Theft protection systems are made up of five basic hardware components: a Node MCU microcontroller, a Relay Switch, a GSM module, and a GPS module.

The vehicle's ignition switch will be connected to the relay switch, and the Node MCU microcontroller will be put in the vehicle.

1. Node MCU Microcontroller: 1. Node MCU Microcontroller: Node MCU is an open source IOT platform with a low cost. It started off with firmware that ran on esperessif systems' ESP8266 Wi-Fi SOC and hardware that was based on the ESP 12 module. This is a microcontroller with only one board.
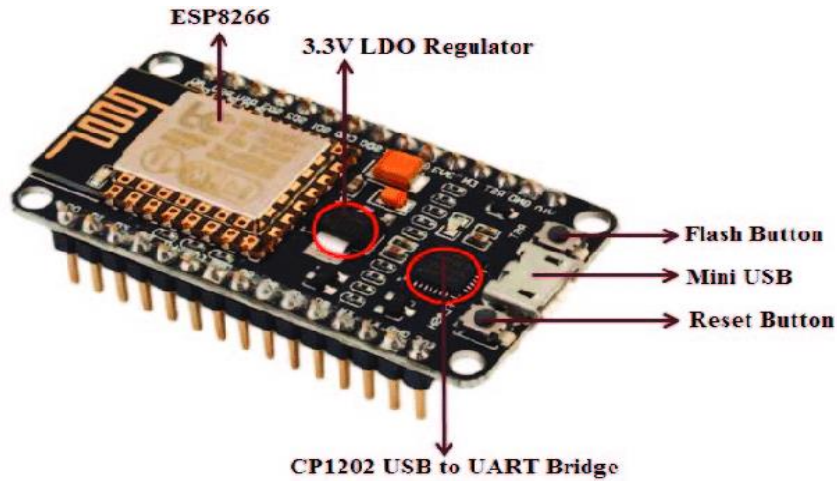

2. Relay switch: The relay module switch is an electrically controlled switch that can be turned on or off to allow or prevent current passage. They're made to work with low voltages, such as 3.3V, like the ESP32. The vehicle will be equipped with this switch.
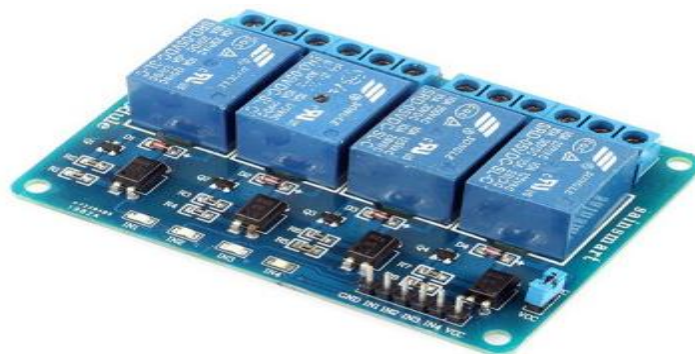
3. GPS & GSM module: The Global Positioning System (GPS) is a space-based satellite route structure that provides area and time data in all climate conditions, wherever on or near the Earth where an unobstructed viewable channel to four or more GPS satellites exists. The framework provides basic capabilities to as many military, civilian, and business clients as possible. It is maintained by the US government and is freely accessible to anyone with a GPS device. The position of a GPS receiver is calculated by accurately timing the signals sent by GPS satellites orbiting high above the Earth. Each satellite sends out communications that include the date and time the message was sent, as well as the satellite's position at the time the message was sent.

The receiver calculates the distance to each satellite using the speed of light and the messages it receives to determine the transit time of each message. A sphere is defined by these distances and satellite locations. When the distances and satellite positions are correct, the receiver is on the surface of each of these spheres. The navigation equations are used to calculate the receiver's location using these distances and satellite locations. This position is then displayed, possibly with a moving map or latitude and longitude, as well as elevation data. Many GPS units display derived information derived from position changes, such as direction and speed. To acquire an accurate result in a normal GPS operation, four or more satellites must be visible.
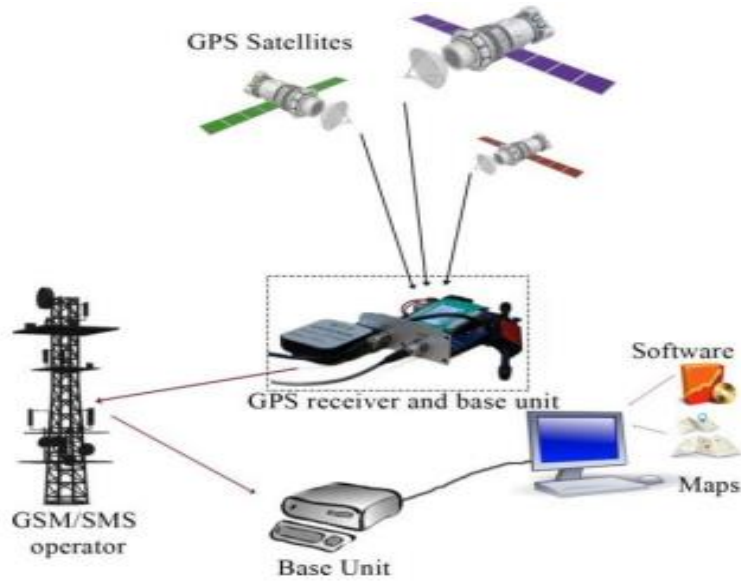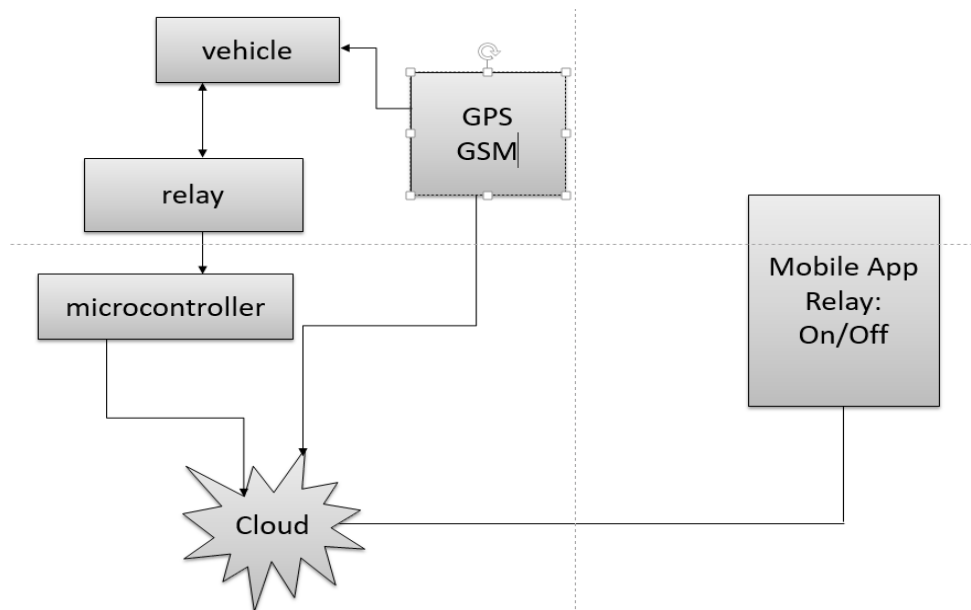
III.   MODELING AND ARCHITECTURE

Figure 1: Architecture diagram.

IV.   RESULTS AND DISCUSSION

In the proposed system it will be possible to control our vehicle's security using the mobile application remotely. User will also be able to track the location of the vehicle continuously on the map, longitude and latitude of the location can be seen on the application. The online-based tracking framework is a system that was created by combining a number of modern data and communication technologies. The system includes vehicle-mounted tracking devices, a central server infrastructure, and a web-based application. Clients will be able to view the area graphically as well as other important vehicle data using the framework. This system is designed to support projects with a large number of cars and complex usage requirements. The area is acquired from a satellite using GPS receiver area coordination sent by GPRS, and the data is passed to the goal server as HTTP packets by the GSM system.

V.   CONCLUSION

In the next days, controlling the security of the vehicle using a mobile application will be crucial and beneficial to everyone. Our system will be focused on delivering vehicle security and controlling vehicle security with a single touch from a mobile application. Unlike other security systems, our solution will be very cost effective.

For communication, a Wi-Fi module node MCU will be utilized, and data will be stored using the MQTT cloud service. In large cities, tracking frameworks or systems are becoming increasingly important, and they are more secure than other frameworks. It has the potential to rise with the specific purpose of strengthening the relationships between people, vehicles, and streets by accumulating current data developments or technologies and ready to construct a real-time accurate, persuasive, and comprehensive transportation framework. This arrangement is simple to update, which makes it open to future requirements and, as a result, more efficient. The proposed work is cost-effective, dependable, and has the ability to prevent theft while also offering a precise tracking system. One of the main components that unifies both GPS and GSM systems is a clever anti-theft system. It is critical due to the large number of people who use both the GSM and GPS frameworks and the widespread use of both by a large number of people all over the world.

VI.   REFERENCES

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