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VEHICLE THEFT ALERT ENGINE LOCK SYSTEM USING GPS & GSM

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Abstract -

Today vehicles are being stolen on a large number and this is the reason why this system is being introduced. To prevent the theft from stealing vehicle, this system detects if the vehicle is in theft mode and if the status is in theft mode, this system sends SMS to the user. After which the user is supposed to send back the message. This message gives command to the vehicle to lock the engine. Whenever a person tries to steal a vehicle, the microcontroller is being interrupted. After which the GSM modem is responsible to send SMS to the user indicating that his vehicle is being stolen. The next step is that the user is then required to send back a message indicating to lock the engine of the vehicle so as to stop it from being stolen. The microcontroller uses a mechanism to stop the engine. In order to indicate vehicle ON/OFF state the system makes use of motors. This project can be further enhanced by using a GPS which will also help to find the exact location of the vehicle. This information can then be sent to the user via SMS.

Key Words: GSM, GPS, Microcontroller.

1. INTRODUCTION

A vehicle theft alert engine lock system using GPS and GSM is a cutting-edge security solution designed to protect vehicles from theft and aid in their recovery. This advanced system combines the power of Global Positioning System (GPS) and Global System for Mobile Communications (GSM) technologies to provide real-time tracking, remote control, and engine immobilization capabilities.

With the rising incidence of vehicle thefts, it has become crucial for vehicle owners to employ robust security measures. The GPS and GSM-based system offers an effective deterrent against theft by enabling proactive monitoring and swift response to unauthorized activities.

By integrating a GPS module into the vehicle, the system can accurately determine its location at all times. This information is transmitted via the GSM module, leveraging cellular networks, to a remote monitoring station or the owner's mobile phone. The system continuously monitors the vehicle's position, status, and movement, allowing for immediate detection of any suspicious activity.

When the system identifies unauthorized actions, such as an attempted engine ignition or vehicle movement when it should be stationary, it triggers an instant alert. This notification is promptly sent to the vehicle owner through SMS or a mobile app, providing crucial details like the vehicle's current location obtained from the GPS module.

The theft alert engine lock system goes beyond mere notifications and empowers the vehicle owner with remote control capabilities. Through SMS commands or a dedicated mobile app, the owner can execute various commands, including locking or unlocking the engine. In the event of a confirmed theft, the owner or authorized personnel can remotely issue a command to immobilize the engine, preventing the thieves from continuing their escape.

One of the most significant advantages of this system is its ability to aid in vehicle recovery. With the GPS module continuously transmitting the vehicle's location data, law enforcement authorities or the vehicle owner can track its movements in real-time. This tracking feature assists in precisely locating the stolen vehicle, expediting the recovery process and minimizing the risk of irreparable damage or loss.

The primary objective is to prevent vehicle theft by implementing a robust security system. The system aims to deter thieves through its advanced monitoring, alerting, and engine immobilization features. The system seeks to provide real-time tracking of the vehicle's location using GPS technology. This enables the owner or authorities to monitor the vehicle's movements and take immediate action in case of theft. The system allows the vehicle owner to remotely control certain functions of the vehicle, such as engine locking or unlocking, through SMS commands or a mobile app. The objective is to provide convenient and immediate control over the vehicle's security features. The system intends to assist in the recovery of stolen vehicles by continuously transmitting the vehicle's location data through the GPS module. This data helps in accurately tracking the vehicle's movements, aiding law enforcement authorities or the owner in the recovery process. The system may have objectives related to customization and integration with other vehicle security systems. This includes compatibility with existing alarm systems, integration with vehicle management systems, and customization options based on specific user requirements.

2. BLOCK DIAGRAM

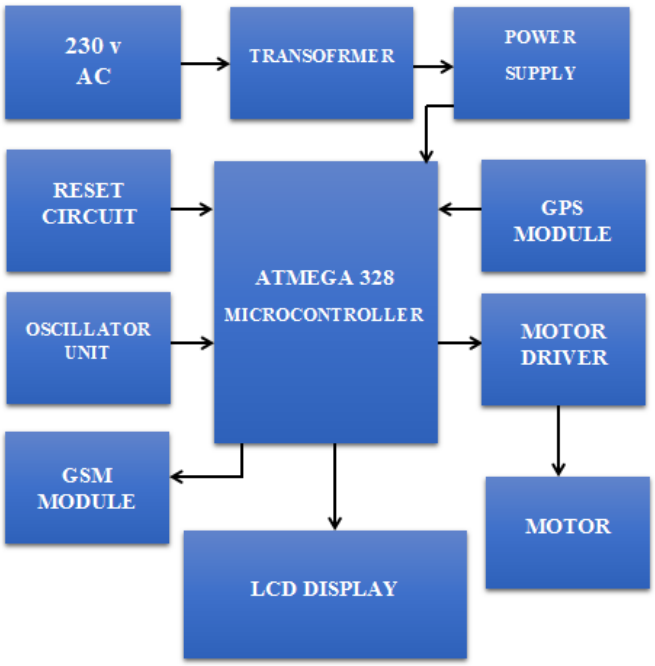

Fig.1: Block diagram

3. TECHNICAL SPECIFICATION

1. Atmega 328

The Atmega328 microcontroller, commonly used in Arduino boards, has a total of 28 pins. These pins serve various functions, including digital I/O (Input/Output) and analog input. The Atmega328 has a total of 14 digital pins labeled from 0 to 13. The Atmega328 has 6 analog input pins, labeled A0 to A5.

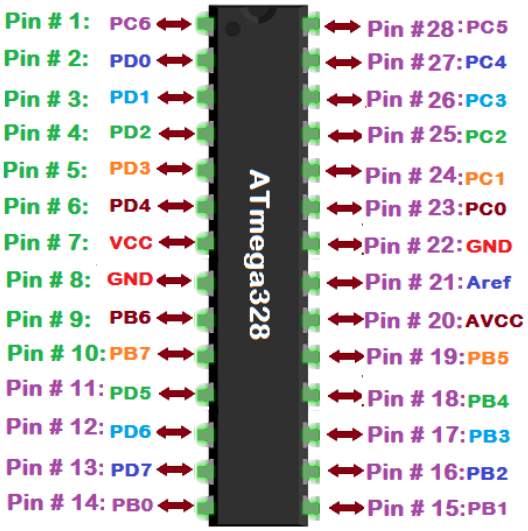

Fig.2: Atmega 328

The Atmega328 has a reset pin labeled RESET. This pin is used to reset the microcontroller, restarting the program execution from the beginning. The reset pin can be pulled low by an external signal or by briefly connecting it to the ground.

The Atmega328 requires an external clock source to operate. It can be connected to an external crystal oscillator or resonator, typically with a frequency of 16 MHz. The oscillator provides a stable and precise clock signal for the microcontroller, ensuring accurate timing for the execution of instructions and other operations.

2. GPS Module

A GPS module is a device that receives signals from GPS satellites to determine its own precise location. It consists of components such as a GPS antenna, receiver chipset, signal processing unit, memory, and communication interfaces. The GPS module captures satellite signals, processes them, and calculates its latitude, longitude, and altitude coordinates through trilateration. These coordinates can be used for navigation, mapping, tracking, and other location-based applications. GPS modules are used in various devices and systems that require accurate positioning and navigation capabilities. It operates on 12v.

Fig.3: GPS Module

3. GSM Modules

GSM modules enable communication with the cellular network, allowing devices to make and receive voice calls, send and receive text messages (SMS), and transmit data over the network. They are used in a wide range of applications, including mobile phones, IoT (Internet of Things) devices, security systems, vehicle tracking systems, and remote monitoring systems. It operates on 12v.

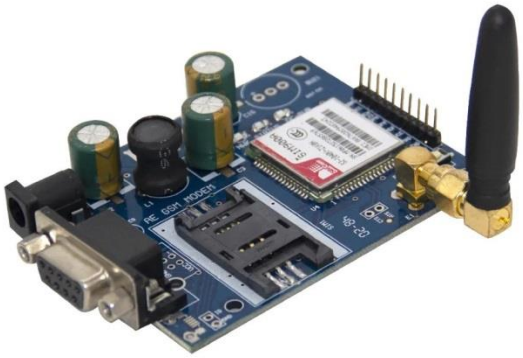

Fig.4: GSM Module

4. LCD Display

A 16x2 LCD display typically uses a parallel interface to communicate with a microcontroller or other devices. It requires a total of 16 pins to connect and operate. By controlling the appropriate pins and sending commands or

character data through the data bus, you can display characters, numbers, and symbols on the 16x2 LCD display. The display allows for two rows, with each row capable of displaying up to 16 characters.

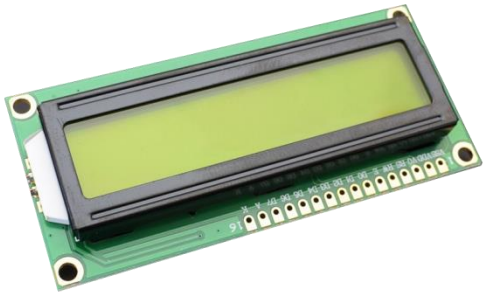

Fig.5: LCD display

4. WORKING

230v power supply is given to the step down transformer. Rating of the transformer is 12v. It can be given to bride rectifier which consists of rectifier, filter and a voltage regulator. Rectifier converts the ac into pulsating dc and filter gives the pure dc signal by blocking ripples. The dc voltage is further regulated and Microcontroller receives this DC power from rectifiers. In this proposed work, a novel method of vehicle tracking and locking system used to track the theft vehicle by using GPS and GSM technology. This system puts into sleeping mode while the vehicle handled by the owner or authorized person otherwise goes to active mode, the mode of operation changed by in person or remotely. If any interruption occurred in any side of the door, then the IR sensor senses the signals and SMS sends to the microcontroller. The controller issues the message about the place of the vehicle to the car owner or authorized person. When send SMS to the controller, issues the control signals to the engine motor. Engine motor speeds are gradually decreases and come to the off place. After that all the doors locked. To open the door or restart the engine, authorized person needs to enter the passwords. In this method, tracking of vehicle place easy and doors locked automatically, thereby thief cannot get away from the car.

5. CONCLUSIONS

In conclusion, a vehicle theft alert engine lock system using GPS and GSM is a highly advanced security solution that provides comprehensive protection for vehicles. By leveraging GPS technology for location tracking, GSM communication for alerts and remote control, and engine immobilization capabilities, this system offers vehicle owners peace of mind and a proactive approach to safeguarding their valuable assets.

This system puts into the sleeping mode vehicle handled by the owner or authorized persons; otherwise goes to active mode. The mode of operations changed by persons or remotely. When the theft identified, the responsible people send SMS to the micro controller, then issue the control signals to stop the engine motor. After that all the doors locked. To open the doors or to restart the engine authorized person needs to enter the passwords. In this method, easily track the vehicle place and doors locked.

5.1 Advantages

- Theft Deterrence
- Real-Time Tracking
- Prompt Theft Alerts
- Remote Control Capabilities
- Integration with Existing Systems
- Peace of Mind
- Recovery Assistance

5.2 Future Scope

The incorporation of artificial intelligence (AI) and machine learning algorithms can enhance the system's ability to detect suspicious patterns and identify potential threats. By analyzing vast amounts of data, AI algorithms can learn and adapt to evolving theft techniques, improving the system's effectiveness in preventing theft.

Biometric authentication, such as fingerprint or facial recognition, could be integrated into the system to provide an additional layer of security. This could ensure that only authorized individuals can control the system or access the vehicle, reducing the risk of unauthorized access or misuse.

The integration of the system with IoT devices and networks could enable seamless connectivity and data sharing. This could allow for more comprehensive monitoring and control of the vehicle's security features, as well as integration with other smart home or office security systems.

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