

Vehicle Engine Locking System Using GSM Technology

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Abstract: This proposed work is an attempt to design an advanced vehicle safety system that uses GSM to prevent theft and to determine the location of vehicle. Currently most of the people having their own vehicle, theft is happening on parking and sometimes driving insecure places. The safe of vehicles is extremely essential for public vehicles. Vehicle engine locking system is installed in the vehicle, to locking engine motor. The main objective of this paper is to protect the vehicle from unauthorized access by giving a secure password and controlling it by using GSM technology. A four digit password is set as default, using a 4x3 keypad and is displayed on the 16x2 LCD. If in case we enter a wrong password a message is sent to the owner's mobile number and a buzzer is heard after a delay of mili seconds time. The main purpose of this project is to prevent vehicle from theft. The functionality is achieved by detecting vehicle status in theft mode and by sending an SMS to owner of vehicle. The owner can then send back the SMS in order to disable ignition of the vehicle. Thus in this way the crimes can be reduced to great extent as vehicles today are being stolen in large number. Hence vehicle today require high security which can be achieved with the help of this application. How this system works is when a person tries to steal the vehicle, the microcontroller is interrupted and the command is send SMS to the GSM modem. This is done in order to stop the engine. Motor is being used in this system in order to indicate vehicle ON/OFF state. This paper mainly deals with the concept of vehicle security and how it can be implemented to the vehicle engine. The GSM technology is used for sending messages to known the status of the vehicle engine.

IndexTerms - : Microcontroller, GSM, LCD, Arduino, Motor.

I. INTRODUCTION

In the last few decades, India has progressed at such an enormous rate that many companies have strongly established themselves here. These companies bring a huge amount of workforce with them. Arranging transportation to such a huge mass is a cumbersome task involving many intricacies. In Present days thefts in automobile is increasing at rapid rate. So to protect automobiles we developed system "Vehicle engine locking system using embedded based GSM technology" which is operated by using 8051 microcontroller with GSM module. It is very cheap and simpler compared to other antitheft vehicle locking systems. The Global system for mobile communications (GSM) is the most popular and accepted standard for mobile phones in the world. It operates in 900 MHz frequency. Many people use GSM service across the world. The usage of the GSM standard makes international roaming very common between mobile users, by accessing subscribers to use their mobile phones in many areas of the world. The main purpose of this project is to prevent vehicle from theft. The functionality is achieved by detecting vehicle status in theft mode and by sending an SMS to owner of vehicle. The owner can then send back the SMS in order to disable the ignition of the vehicle. The GSM based system is one of the most important system, which integrate GSM .

II. COMPONENTS INTERFACINGS AND PROTOCOLS

1).POWER SUPPLY:-

This power supply section is required to convert AC signal to DC signal and also to reduce the amplitude of the signal. The available voltage signal from the mains is 230V/50Hz which is an AC voltage, but the required is DC voltage(no frequency) with the amplitude of +5V and +12V for various applications. In this section we have Transformer, Bridge rectifier, are connected serially and voltage regulators for +5V and +12V (7805 and 7812) via a capacitor (1000µF) in parallel are connected parallel as shown in the circuit diagram

2).ARDUINO MICROCONTROLLER:-

The AT89S52 is a low-power, high performance complementary metal-oxide semiconductor (CMOS) 8-bit microcontroller with 8K bytes of flash programmable and erasable read only memory (FPROM). The device is manufactured using Atmel's high density nonvolatile memory technology and is compatible with the industry standard 80C51 and 80C52 instruction set and pin out.

Features:

- Compatible with MCS-51 Products
- 8K Bytes of In-System Programmable (ISP) Flash memory
- 4.0V to 5.5V Operating Range
- Fully Static Operation: 0 Hz to 33MHz
- 256K Internal RAM
- 3 16-bit Timer/Counters
- Eight Interrupt Sources
- Full Duplex UART Serial Channel

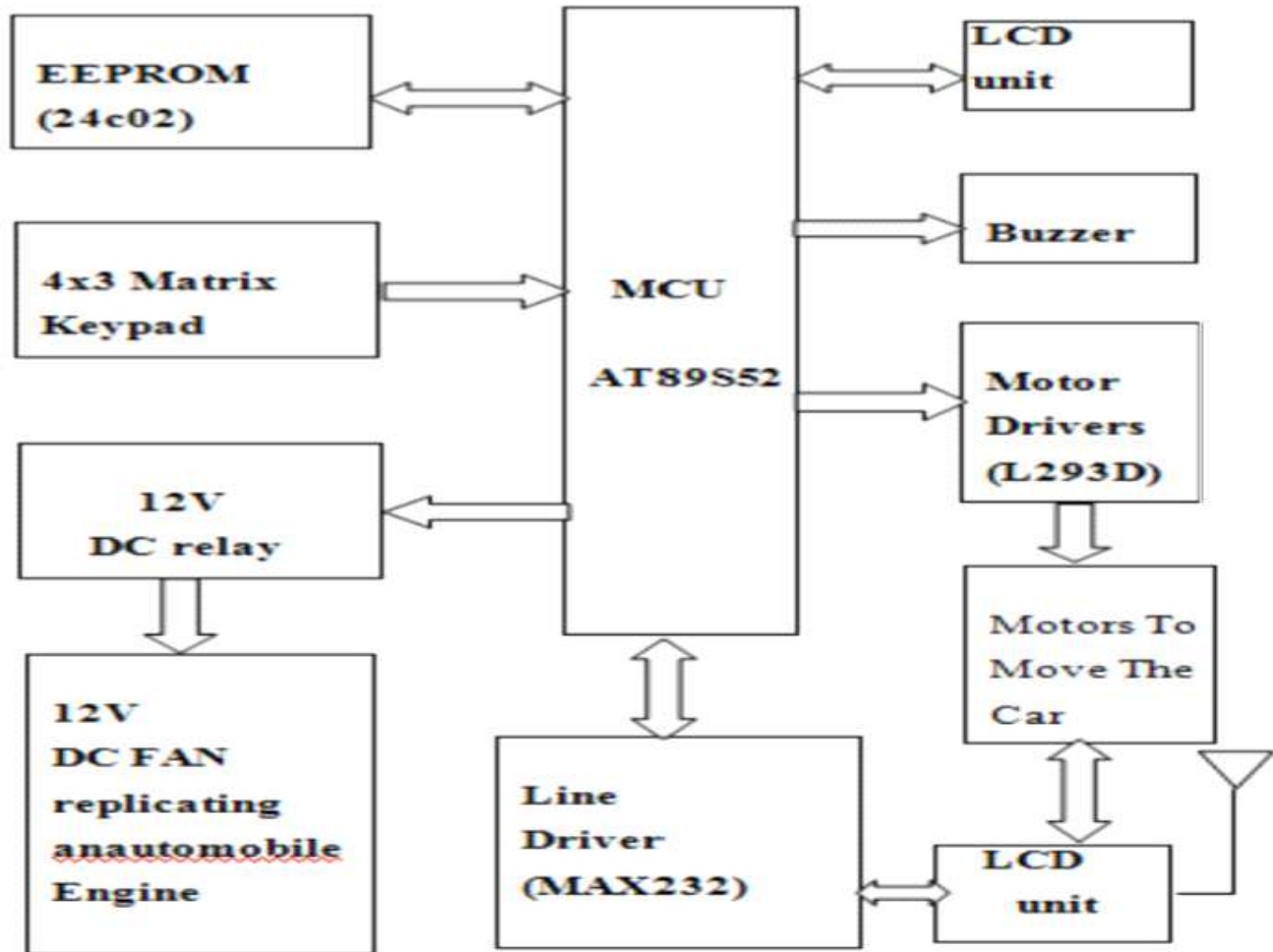


Fig1. Block diagram

3). GSM MODEM:-

The GSM Modem comes with a serial interface through which the modem can be controlled using AT command interface. Here we use a SIMCOM made (SIM300) modem interfaced with the microcontroller operates in 900 MHz frequency. The GSM modem specific commands are adapted to the services offered by a GSM modem such as: text messaging, calling a given phone number, deleting memory locations etc. Since the main objective for this application is to show how to send and receive text messages, only a subset of the AT-commands set needs to be implemented.

“AT command set for GSM Mobile Equipment” describes the Main AT commands to communicate via a serial interface with the GSM subsystem of the phone.

4).16x2 LCD DISPLAY UNIT:-

A program must interact with the outside world using input and output devices that communicate directly with a human being. One of the most common devices attached to a controller is an LCD display. Some of the most common LCDs connected to the controllers are 16X1, 16x2 and 20x2 displays. This means 16 characters per line by 1 line 16 characters per line by 2 lines and 20 characters per line by 2 lines , respectively.

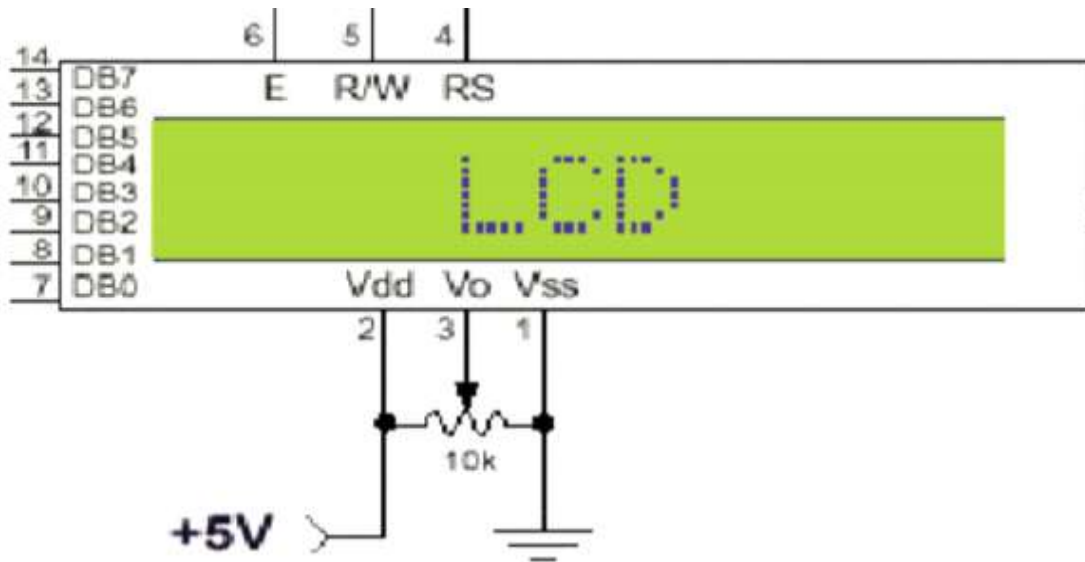


Fig2. LCD Display

Fig3. Circuit Diagram of Power Supply

5). IGNITION MODULE:-

An ignition control module (ICM) is a computer that controls the ignition coil or the ignition coil's firing time. The ignition control module is the heart of an automobile's ignition system, because it regulates spark generation within the engine. The ignition control module relies on the car battery to provide the 'spark' that sets the ignition system in motion and then ultimately turns on the vehicle. In other words, a car's ignition has the job of taking the 12V of battery within the car, and using it to generate a high voltage that can then be sent to spark plugs, which start the vehicle. The ignition control module is normally located inside or near the car's distributor and is usually coated with insulating compounds to protect its internal electronic components.

6). VIBRATION SENSOR:-

The Vibration Sensor Detector is designed for the security practice. When Vibration Sensor Alarm recognizes movement or vibration, it sends a signal to either control panel. Developed a new type of omni-directional high sensitivity Security Vibration Detector with omni-directional detection. This sensor buffers a piezoelectric transducer. As the transducer is displaced from the mechanical neutral axis, bending creates strain within the piezoelectric element and generates voltages. Various machine operating conditions concerning temperature extremes, magnetic fields, vibration range, frequency range, electromagnetic compatibility (EMC) and electrostatic discharge (ESD) conditions and the required signal quality necessitate the need for a variety of sensors.

7). DC MOTOR DRIVER:-

Our DC motor driver family provides the simplest and most flexible IC solution available for driving brushed DC motors. Features that simplify designs include integrated power MOSFETs and a charge pump-less power architecture that provides integrated current limiting and flexible current regulation modes. Monitoring and safety features such as enable cooler running temperatures for long lived operation. DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems.

8). DC MOTOR :-

A DC motor is any of a class of rotary electrical machines that converts direct current electrical energy into mechanical energy. The most common types rely on the forces produced by magnetic fields. Nearly all types of DC motors have some internal mechanism, either electromechanical or electronic to periodically change the direction of current flow in part of the motor. DC motors were the first type widely used, since they could be powered from existing direct-current lighting power distribution systems. A DC motor's speed can be controlled over a wide range, using either a variable supply voltage or by changing the strength of current in its field windings. Small DC motors are used in tools, toys, and appliances. The universal motor can operate on direct current but is a lightweight motor used for portable power tools and appliances. Larger DC motors are used in propulsion of electric vehicles, elevator and hoists, or in drives for steel rolling.

9). BUZZER :-

A buzzer is an audio signaling device, which may be mechanical, electromechanical or electronic. Typical use of buzzer/beeper includes alarms and timers etc.

III .WORKING OF THE MODULE

The embedded system installed in the engine of the vehicle along with the GSM modem. By entering correct password the instrument allows to activate the 12V relay and then ignition of the engine will start. If anyone tries to enter the password randomly, then after three tries, the MCU will block the entry of further password. Then, the buzzer will turn on to create a noise. The entire system is installed in the engine along with GSM modem. After giving the power supply and checking the status of the GSM, If the status of the GSM is off, then we can operate the entire

system with a switch. The entire system is installed in the engine along with GSM modem. After giving power and checking the status of the GSM, an SMS is send to the owners mobile. On receiving the conformation start the engine and vehicle moves forward. If the status of the GSM is off, then we can operate the engine system with a switch. The main purpose of this project is to prevent vehicle from theft. The functionality is achieved by detecting vehicle status in theft mode and by sending an SMS to owner of vehicle. The owner can then send back the SMS in order to disable ignition of the vehicle. To protect automobiles we developed technology which is operated by using microcontroller 8051 with GSM module.

Features of GSM :

- Single supply voltage
- Typical power consumption
- Tri-band
- MT,MO,CB, text and PDU mode,
- SMS storage: SIM card
- Supported SIM card :1.8V, 3

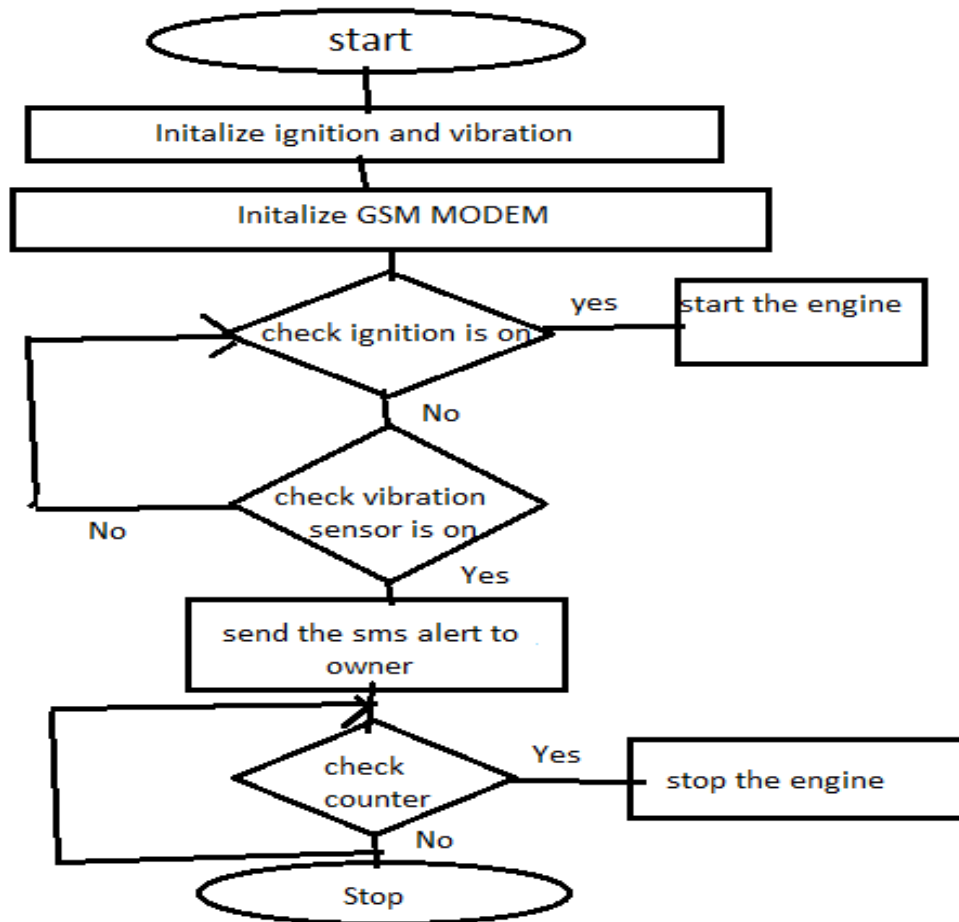


Fig3.Flowchart

IV. FUTURE SCOPE

1. Cameras can be incorporated into the system to identify the person.
2. Presently only SMS feature is available, we can include the Call feature for ease of operation.
3. Using android application we can also stop the engine.
4. Microphone could be interfaced to the GSM/GPS module so that during theft activity voice call could be established with the owner.
5. This system will be used in all automobiles vehicle in next generation due to its features. In addition to this we can also add extra features like GPS to identify the location of the vehicle and also to prevent vehicle collision and accidents.

V. CONCLUSION

This method of the design is unique and it has features like low cost, and reliable theft control system for an automobile It is a threat to vehicle thieves and it cannot be accessed by an unknown persons since it is based on GSM technology. In our project the security system is based on embedded control which provides security against theft. The GSM modem provides information to the user on his request. The owner can access the position of the vehicle at any instant. She/he sends a message in order to lock the vehicle. This project deals with the design & development of a theft control system for vehicle as well as protect the life of rider. In this paper, we have proposed a novel method of vehicle engine locking

system used to lock vehicle engine by using GSM technology. When the theft identified, the responsible person send SMS to the microcontroller, then issue the control signal to stop the engine motor.

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