

A REVIEW ON ANTI-THEFT CONTROL SYSTEM DESIGN USING EMBEDDED SYSTEM

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Abstract: In this paper we gave a review on anti-theft control system for vehicles that helps to prevent the vehicles from theft. Nowadays security of automobiles from theft is common in parking places has become an important. an efficient kind of systems are introduced. We can use various kinds of sensors like proximity sensor, microcontrollers with GSM, vibration sensor are used to implement.

The sensor sense key during installing and forward a text message to the vehicle owner's mobile declaring that the car is being retrieved. This system is followed at present in the vehicle asking the user to enter a special password. the password consisting of different figures and the numbers of car key. If the user enters a wrong password in three trails warning message will be sent to the police and the owner of the vehicle. By using GPS module police can trace the location of vehicle. Not also a message fuel of vehicle is also will be locked. So that theft cannot get access to drive the vehicle. Simultaneously secret lock system gets initiated and forbidden user gets caught inside the vehicle. The vehicle and owner is equipped with the key to the secret lock system can shutoff. The mechanism this technique will be very useful in taking fast steps forward an attempt in stealing the vehicle.

KEYWORDS: GSM, GPS, Electronic Lock, Embedded System, Anti-Theft Mechanism

I. INTRODUCTION

Now a days vehicle thefts rate is increasing very rapidly all around the world that made people to start using the anti-theft alarm but which were very costly and not much efficient and not worthy so for that we have been made an attempt to design and develop a very simple low-cost vehicle theft control scheme using an in-built microcontroller and mobile for communication purposes.

[1]The Global system for mobile communication (gsm)is the most used and the standard mobile phones in the world over the world the number of users of a gsm is more than a billion that makes the international roaming as very usual and very common between mobile phone operators so that makes the users or subscribers use their phones in various parts of the world and also that gsm differs in two ways like in signal and speech signals are also digital and that is considered as a 2nd generation of mobile networks that is also called as a(2G) mobile phone system .

The recent stats on vehicle theft rates in in various countries are given below in the table

Tabel.1.[1]

Rank	Countries	Amount
1	United States	1,246,096
2	United Kingdom	348,169
3	France	301,539
4	Italy	232,564
5	Canada	161,506
6	Mexico	141,007
7	Australia	139,094
8	Spain	134,594
9	South Africa	93,133
10	Germany	70,617

They start this paper by exploring the invented things scene now we move to the proposed design describing the module in detail and the working of that module and the finally we will give you the simulation results and the components details and specifications and this concept will be implemented as a prototype model

II. EXISTING SYSTEM

[1] There are many and many more antitheft systems which are developed in the past few years. An integrated security circuit board that can talk or communicate with the (electronic control units) ecu's and the sensors inside the automobile\vehicle through (controller area network) CAN bus, (local interconnect network) LIN bus, Flex RAY and MOST Bus communicates with other vehicles, road side infrastructure and mobile phones with wireless interfaces. The main drawback with this model is that the data is timeliness and the network delays to realize and reliable to secure car communications. But in the other anti-theft systems it includes a in vehicle anti-theft component that will not on the functions of the various appliances placed to the car if it was founded it was illegally moved to another car, so we needed a secure processor and smart cards chips to store the group identification number for this there are many remote controlled security systems that makes car to be shuttled down or disable and its key auto systems through remote control when it is stolen this requires a secure vehicle to vehicle communications channel.

1. The Presently available systems:

[2] The data such as location, speed, velocity was being recorded and transmitted to the confidential accounts for the users using the mobile cellular networks and we can also control the vehicle for a few scenarios like you can give commands to the vehicle like to stop the vehicle door locking etc... Through the nodes and pda services or through mobile phones.

2. The Disadvantages of existing system:

[3] The cellular network will not in every place throughout the country like in forests and un-recognised areas and rural areas etc.

To implement the system in the car. The cost of the system will be equal to the half of the cost of the car that made it to be more expensive and not affordable by all the users.

So we will work on a full-fledged security and control system and make sure to eliminate the theft of automobiles by taking into consideration of existing systems

III. Principles and Methods

[2]Firstly, let us know about the inductive proximity sensor and vibrating sensor then they can know the use of the sensor as the first lock system.

Proximity sensor:

The inductive property sensor works on the principle of electrical principle of inductance Inductance is nothing but the phenomena of alternating current which is having a magnetic component, which emits a electromotive force which is also called as emf [3]. In a target object to amplify a device inductance so that a sensor has been made twists wire into a tight coil and passes current through it.

The figure.1 has 5 components in it

- 1.coil/field sensor
- 2.oscillator
- 3.detection circuit/demodulator
- 4.flip flop
- 5.output circuit

[2]The component of the sensor the oscillator is generating a fluctuating magnetic field in the shape of a doughnut around the winding of the coil which was present in the device sensing face. when a metal object moves inside the sensor's field eddy currents will be formed in the metallic object, then it was magnetically pushed back, and finally reduce the sensor's own oscillation field. [1] The sensors detect the oscillatory strength and triggers the output from a output circuit when the oscillator becomes reduced to a sufficient level



Figure 1: Proximity Sensor

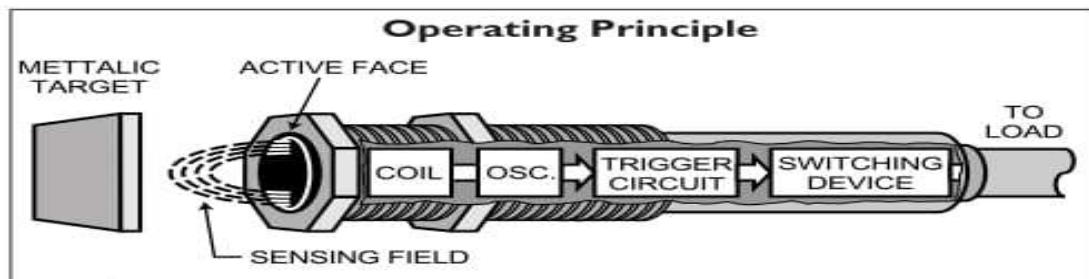


Figure 2: Block diagram of Proximity Sensor

[6].The inductance of the loop will be changed according to the material kept inside it and where the metals are more effective inductor in presence of that increases the current flowing

through the loop. This can be sensed by some circuits and which can give a signal to other devices when metal is detected.

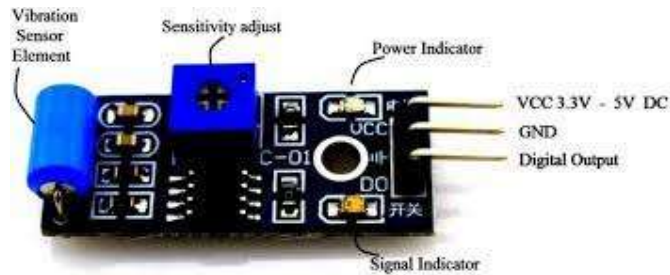


Figure 3. Vibration Sensor

The Figure 3. Uses the Comparator LM393 and the Vibration Sensor SW-420 to determine whether there is any vibration that exceeds the threshold. [7] The on-board potentiometer allows threshold adjustment. When there is no vibration, the output logic of this module is LOW, and the signal denotes an LED light. If the module doesn't vibrate, the vibration switch was in the closed-on position and the green light is turned on. When a product vibrates, the vibration switch briefly disconnects, driving the output high and turning off the green light. In this they are utilizing proximity sensor than vibrating sensor because it identify the key better than vibrating sensor.

IV. Proposed System

Architecture of the Proposed system

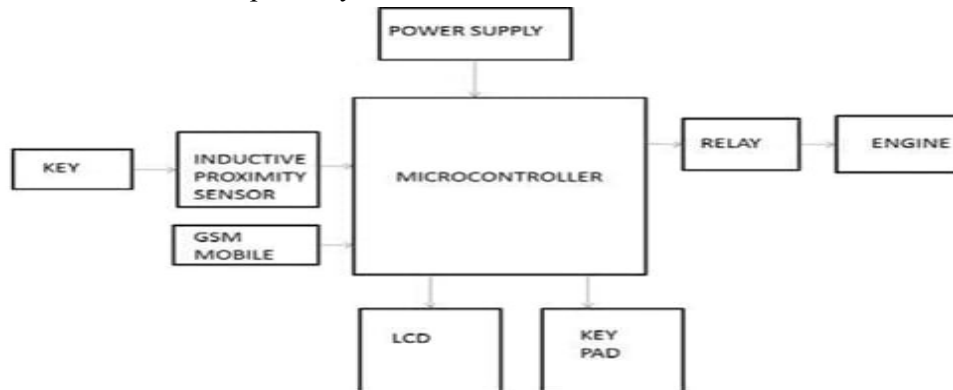


Figure 4: Block Diagram Explaining the Principle of Anti-Theft

Control System

The Figure 4. shows the block diagram explaining the principle of anti-theft control system. When the key was kept inside the keyhole ,the sensor detects and triggers a microcontroller , and then the microcontroller work starts which ask the password to type was displayed on the LCD screen and on the same time when the microcontroller gets the power message to the owner will be sent with the help of a GSM tells that users car was tried to unlock and the password entered the numeric keypad which was given 3 chances to unlock, if the entered password is incorrect , a second lock system placed in the door will be got activated and again through the GSM module another message was sent to the owner about the unauthorized usage .

V. Modules Used

A. Micro controller used:

[7]In our prototype they use ATMEGA 328 as shown in the figure.5. which is very easy simple and compact. Arduino board normally consists of 8-bit Atmel AVR microcontroller with complimentary components to facilitate programming and incorporate into the other circuits. the Arduino is the standard way of all the connections were exposed, allowing the CPU board to be connected to an interchangeable various add on modules (known as shields). For official purposes we use mega AVR series of chipset, specifically the ATmega8, AT mega 168, AT mega 328, ATmega1280. Also, there are many more which were compatible with this, most boards include 5volts linear regulator and 16MHz crystal oscillator also some run at8MHz. Arduino 's microcontroller is also preprogramed with a bootloader that simplifies uploading of the programs to the prebuilt chip's flash memory, compared with other devices that was typically need an external chip programmer



Figure 5: ATMEGA328P_circuit board

B. Global System for Mobile Communication (GSM)Model:

[7]GSM modem is a special modem which accepts a sim in it as shown in figure.6. and operates over a subscription to a mobile operator, just like a mobile phone. For a mobile operator a GSM modem is a mobile phone. if we connect it to a computer it uses gsm for communication over a mobile network. while gsm is most used to provide cellular internet many of them can be used to send or receive SMS and MMS messages



Figure 6: GSM module

C. Keypad:

Figure.7.is used for giving the data input of a passcode after entering into the vehicle for the validation purpose which is a 4*3 matrix keyboard connected to a microcontroller it shows 4*3

matrix which were connected to two ports where two rows are connected to a output port and two columns are connected to a input port if no key was pressed reading through input port will be taken for all columns since they were connected to high voltage Vcc. [5] If all the rows were grounded and a key is pressed one column made 0 because pressed column made grounded .and there will be a function which runs continuously to detect or identify the key which was pressed



Figure 7: keypad

D. LCD (Liquid Crystal Display):

[7]The LCD was connected to port 2 (p2.0 top2.7) of the microcontroller variable resistor is connected to a pin 3 of LCD low cost capable of displaying inputs. The variable resistor is used to regulate the brightness of lcd. The lcd is of low cost and low power device has a capability of displaying texts and images. These are most commonly used in Embedded systems



Figure 8: lcd(liquid crystal display)

E. RELAY:

The relay you are using is an electromechanical relay. The required supply voltage is +12 V DC. BE driven Equipped with relay driver IC ULN2003/VLN 2003A. Device Connected to an electromechanical relay. [8] The relay Applies 12V DC to energize the relay and pulls it in the process turns on the device and the excitation voltage is stops, the relays drop out and switch at the same time to Turn off your device. Copper wire coil insulated with magnetic relay Used to magnetize and attracts the plunger.



Figure 9:Relay

F. ENGINE CONTROL UNIT:

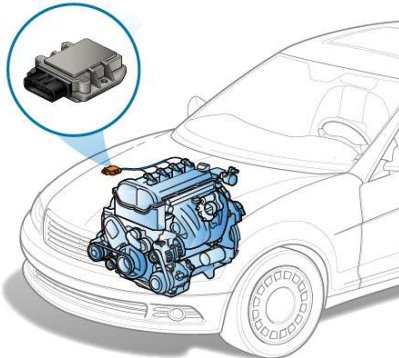


Figure 10: Engine control unit

As a powertrain control module (PCM) or engine controller module (ECM) is a type of an electronic control unit. Determines amount of fuel, ignition timing, etc. Parameters that internal combustion engines must comply with them.[9] This is done by reading the values from the multidimensional Performance maps using input values (e.g., engine speed) calculated from the input signal. A sensor device that monitors the engine in front of the control unit air/a fuel mixture, ignition timing and idle speed were directly Controlled by mechanical and pneumatic sensors and actuators. For ignition control units (gasoline engines), the ignition the coil is the coil of the vehicle ignition system used for conversion. Sufficient voltage to spark at the spark plug. That is how we can Control the ignition control unit by current control used in ignition coil.

VI. WORKING OF THE SYSTEM

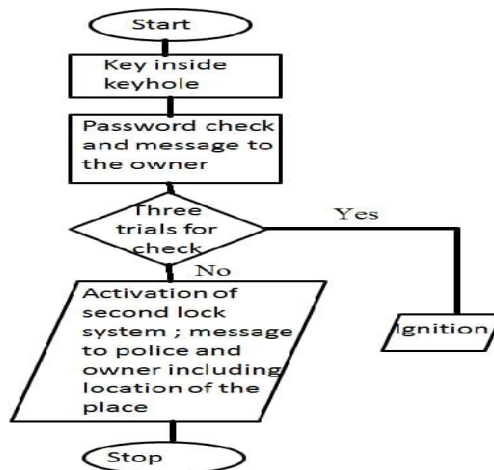


Figure 9: basic block diagram of working of the system designed

The above block diagram which has 7 parts explained about how the system works from the scratch to the end.It has a keyhole from which the procedure starts and works on inserting the key in the hole and then they have to type the password until it gets 3 chances which its gets correct the car can start but if the wrong password typed it sends a message to the consumer as well as a police station with Geo-tag and the SMS that being stolen and a consumer can know

and also the police men and that is how the project works .And that is the working of the module is and that was the above figure 9 explains.

VIII. CONCLUSION

Hence, they have done the attempt to make low cost and effective vehicle theft control system. The best part for it is this project can be done by the minimum amount of an investment done in the automobiles and bringing the setup in less sophisticated and in the basic technology. As students we believe that ANTI THEFT CONTROL SYSTEM would be a successful technology and useful too. so that we think through this system we can simulate the rate of theft automobiles around the world, if that happens, we considered as aim of the project was archived.

IX. FUTURE ENHANCEMENTS

1. It can be made more compact by bring all the sensors in single module and advanced models of GSM can be used.
2. They can add a Bluetooth sensor for the key and a Bluetooth identifier to car module and that can sense the key coming near the car and then it can disable all the procedure and it can start as a normal car.

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