



IoT Security and Hardware Implementation using DTMF 8870

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Abstract: Now-a-days most of the people preferred own vehicle. So theft of the vehicle is increasing. The main aim of this project is to protect vehicle form being stolen. This project will focus on developing an enhancement of the vehicle alarm security system via call. The system will manipulate a mobile phone to send call. Even though the call can be sent using the features available in the mobile, the objective is to the present vehicle security system. Instead of human to human telecommunication, this system creates new entity which is machine to human telecommunication. This system is an upgrading and improving vehicle security system by integrating call features to alert vehicle owners whenever intrusion occurs. This project involves hardware and software parts construction and the integration of both parts to create the system. We succeed in achieving the objective and in fact, add another feature to the system which will initiates a call to the owner after sending the call. Once, the vehicle is being stolen, the information is being used by the vehicle owner for further processing. The information is passed onto the central processing insurance system which is in the form of the sms, the microcontroller unit reads the sms and sends it to the Global Positioning System (GPS) module and using the triangulation method, GPS module feeds the exact location in the form of latitude and longitude to the user's mobile. By reading the signals received by the mobile, one can control the ignition of the engine.

Keywords:- GSM, vehicle locking, vehicle tracking, Alerting system, GPS, IoT application

INTRODUCTION

Internet of Things

IoT stands for Internet of Things. The Internet of Things (IoT) is a system of interrelated mechanical and digital machines ,objects, computing devices, people or animals that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-computer or human-to-human interaction. The technology becomes smaller and faster day by day and towards always connected model[1]. This technology makes each and every physical devices to communicate with each other through internet. This new concept of internet is known as Internet of Things. Every devices form mobile phone to car, home appliances everything is connected through internet using open IPV6.IoT allows machine to machine communication through internet. As IoT is connected through internet security is pretty much necessary in IoT[1].

Anti Theft Alerting System

We are living in the era where theft of automobiles is increasing gradually. In a situation where there is high level of t heft, there is need for better security system. It is much safer to have a system that monitors and communicates to the device owner without putting human life to risk in the name of "Watchman". This tends to utilize the availability of GSM network, mobile phone and electronics circuit to achieve an automated system which is programmed to work as a thinking device to accomplish this purpose. By simply dialing the phone number of the mobile phone attached to the circuit and sending a code after the phone has automatically been answered, puts the system to either "Active or inactive" state, and on any attempt of theft the system sends a call to the device owner, demobilizes the System (vehicle) and then starts up a call. With this, the vehicle is always protected[2].

The total absence of sufficient security Personnel in a packed vehicle are a great discomfort to vehicle owners.

This insecurity has paved way to increasing rate of stealing packed vehicles – even with security. In order to enhance an improved and life risk free security system, the purpose of this thesis is to aid a better security system of vehicles with the use of GSM. This system monitors one's vehicle against theft, and has a call sent to the vehicle owner, telling him that his vehicle is being tampered, and at which part of the vehicle (either doors or boot) is being tampered. The system will also demobilize the vehicle that is stopping the vehicle from moving, set up a call for the people around to notice what is happening[3].

Vehicle tracking system main aim is to give Security to all vehicles. Accident alert system main aim is to rescuing people in accidents. This is improved security systems for vehicles. The latest like GPS are highly useful now a day, this system enables the owner to observe and track his vehicle and find out vehicle movement and its past activities of vehicle[2].

Overview of the System

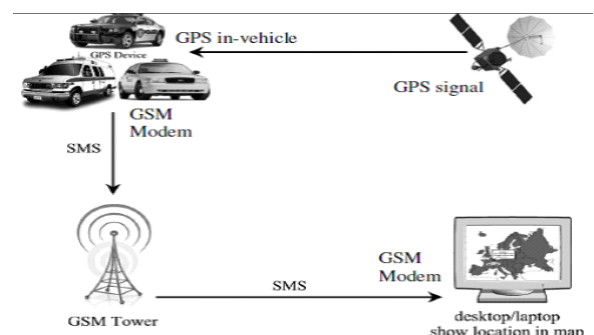


Figure 1.Overview of the System

Here is the block diagram of the system is shown in the above figure. Basically the task of this project is to develop the embedded device which can protect automobiles and which can be helpful in medical emergencies and various

applications as well. This system is connected with the GPS and GSM module. This can be helpful for providing location as well as alert. This system is attached with the automobiles and when anti theft mode is on, this system will automatically notify the owner if any tampered is done with the automobile. This system will directly call the owner through GSM. Owner can control the ignition of the system using mobile phone. After turning off the ignition the owner can request for the location of the vehicle. GPS connected with the system will provide the location of the vehicle to the owner. By which owner can easily track the vehicle in Google maps[4].

PROPOSED SYSTEM

In this proposed work, a novel method of vehicle alerting system is developed. This device is used to track the vehicle using GPS module and one can control vehicle using GSM module. In this system DTMF(Dual Tone Multi Frequency) module is connected with the AVR microcontroller and GSM module and GPS receiver. The owner can send the sms to the device to lock unlock the vehicle. Micro controller will keep listening to the New SMS arrival. If a sms arrived, it will check for authentication and after authentication is verified it will read the GPS location and will send it to the user's cell phone in the form of sms, also same information will be sent to a host pc. This will extract the sms information from GSM modem or cell phone, and it will plot the latitudes and longitudes on the Google maps. For plotting on the Google maps pc must have an internet connection.

This project deals with the design & development of a theft control system for an automobile, which is being used to prevent or control the theft of a vehicle. The simulation of the circuit design and its implementation is done using PROTEUS system. This system is designed to improve vehicle security and accessibility. With the use of wireless technology vehicle owners are able to enter as well as protect their automobiles with more passive involvement. Ideally, this project could be made more convenient and secure with the use of satellite modems instead of cell phones as tracking device as the system may fail when there is no network coverage. In our project the security system is based on embedded control which provides security against theft. The System provides information to the user on his request. The owner can access the position of the vehicle at any instant. In the circuit diagram, the system's mechanism has described. Here, a cell phone is connected in the control unit via headset. When a call is made the cell phone in the control unit auto answered. Then password is being pressed. These DTMF decoded by a dedicated decoder MT-8870 .Then decoded output sent to the microcontroller, which issues command to control devices connected to it(shown in Figure2: circuit diagram for the system).

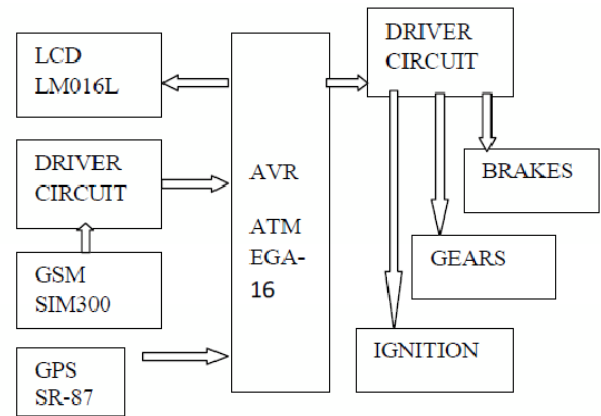


Figure 2. Proposed System

Device switching is performed The circuit diagram for the voice call unit is shown in Fig2. When the microcontroller detects a triggering signal from the scanned units, the numbers recorded on the SIM card of the mobile phone are called sequentially by relay and the MC activates the voice message unit. The MC also sends a deactivation signal when the recorded message is played back. This operation continues in the same manner until the last call is performed. The speaker output of the ISD is connected to the cellular phone speaker so that the recorded call is directly heard by the receiving end of the phone that has been called[6].

Table 1. Equipments Used

DTMF IC	MT8870/KT3170 18pin
Crystal	3.5795 MH7
PCB wire	Small PCB 4x4
Zener diode	ZD 5.6v
Simple diode	IN 4148
LED	LED- 3 watt (4mm)
Capacitor	0.1 af(ik 102)
Metal Transister(NPN)	SL100
Relay	12v DC input 8lag
Register	56k, 47k , 150k, 330,1k

RESULT AND SCREENSHOTS OF THE SYSTEM

All the results and the working of the system is tested by us. It successfully protects the cars. This is useful device for the car owners. Everything in the proposed system is developed and tested successfully by us. And everything is working perfectly. The screenshots of the working of the system is shown below.

Applications

- The applications for this project are in military. Navigation. Automobiles. Aircrafts. Fleet management remote monitoring. Remote control. Security systems. Teleservices. etc.
- These systems are also used in consumer vehicles as devices for preventing theft and retrieving stolen/lost vehicles. These tracking systems can be used as an alternative for traditional car alarms or in combination with it. Installing tracking systems can thus bring down the insurance costs for your vehicle by reducing the risk factor.
- The project that has been introduced here can be used for variety of applications –

- Personal Vehicle Protection
- Car navigation
- Fleet management/tracking
- Palmtop, Laptop, PDA, and Handheld
- Location Based Services enabled devices

Limitations

- The main limitation is if there is no internet connection this device is not able to send the location to the registered mobile number.
- If there is no network availability the system wont be able to connect the call with the owner.



Figure 3 .Incoming call from the device attached with the vehicle



Figure 4.Ignition is turned off by pressing 8



Figure 5. Ignition is Turned on by pressing 5

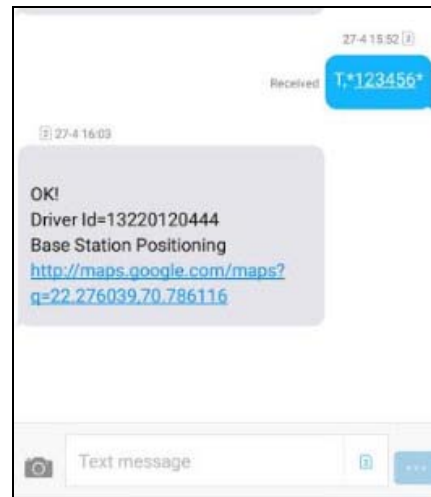


Figure 6 .Text message with location link



Figure 7.Location of vehicle by copying link in web

CONCLUSION

This security technology is also very effective solution to prevent the automobile stealing with the aim of reselling key auto systems. This is achieved by introducing four layers of security features written in the form of firmware and embedded on the ECUs. Hence, our system deters thieves from committing the theft because they will gain little economic benefits from his theft in spite of the risks he will be taking. Therefore, my automotive security technology is a most effective anti-theft solution at current stage. The experimental results show that the owner can securely control his vehicle within a few seconds, and the running time of my security software is acceptable. This system can also be beneficial for the medical emergencies. This system works properly and gives satisfactory result.

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