A Wireless Car Security System That Gives Instant Security Alerts Using GSM Technology

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Abstract:

Ensuring passenger safety is order of the day for high end cars. Today's cars are coming up into automotive market with inclusion of high end passenger safety system. Regulatory norms insist for functional demonstration of such systems before a particular car is launched in market. The vital requirements that need to be met during such demonstration are spontaneous reaction of sensors in actuating the said safety system with in no time and no physical to the passenger or car. This Project main aim is to provide high security for cars using GSM and DTMF Technology through embedded network. This system has provides password based security access through user mobile phone using DTMF decoder, if password is matched then embedded controller checks the password and gives access signal to car ignition ON, if password wrongs this system send alert message immediately to preloaded number (owner) using GSM, So the we can provide more security for automobiles.

Keywords:

Passenger Security, Cars, GSM, SMS Alert, Password Protection.

Introduction:

The automotive industry in India is one of the largest automotive markets in the world. It was previously one of the fastest growing markets globally, but it is currently experiencing flat or negative growth rates. In 2009, India emerged as Asia's fourth largest exporter of passenger cars, behind Japan, South Korea, and Thailand, overtaking Thailand to become third in 2010. As of 2010, India was home to 40 million passenger vehicles. More than 3.7 million automotive vehicles were produced in India in 2010 (an increase of 33.9%),

making India the second fastest growing automobile market in the world (after China). India's passenger car and commercial vehicle manufacturing industry recently overtook Brazil to become the sixth largest in the world, with an annual production of more than 3.9 million units in 2011.While Indian government is still planning to bring in safety reforms with regard to braking and supplemental restrain system (SRS) airbags, which are already a standard in developed markets, the safety rating is expected to force car manufacturers to go for higher safety devices. In Europe, cars with higher NCAP ratings attract much lower premium and are preferred by customers. In India, currently most of the cars do not come with critical safety features like airbags or anti-braking system as standard equipment.GSM based security system are much more stout then an ordinary security system. The ordinary systems are simply based on the concept of sensors.

We proposed with GSM techniques and a better decision making process is built to make our vehicle more secure. It is a unique wireless home/car security device that gives instant alerts on your mobile phone the moment a security breach is detected. It is designed to alert you wirelessly through a message alarm system intercept an intrusion. Proposed an 8 bit embedded controller inter model. The control mechanism is based on DTMF tones generated by mobile phone when the number keys are pressed.This Project presents an automotive localization system using GSM-SMS services. The system can send the SMS based alerting messages to the relatives/owner on his mobile phone as a short message (SMS) in case of thest or emergencies. This system must read the password from owner mobile phone before enter the car or ignition start,then only car door opens and ignition ON.If any unauthorized or theif has trying to open the car door/breaks this system asks password to switch on Car ignition,if password has fails then this system embedded controller immediately send alert message to owner whereever he presence,so that owner can alert and secure his vehicle.

This system is also provided with emergency switch which can be turned off through an SMS and also automatically gives alert to owner/surrounding when fire occurred in Vehicle so that the owner and travelling persons can safely escape.
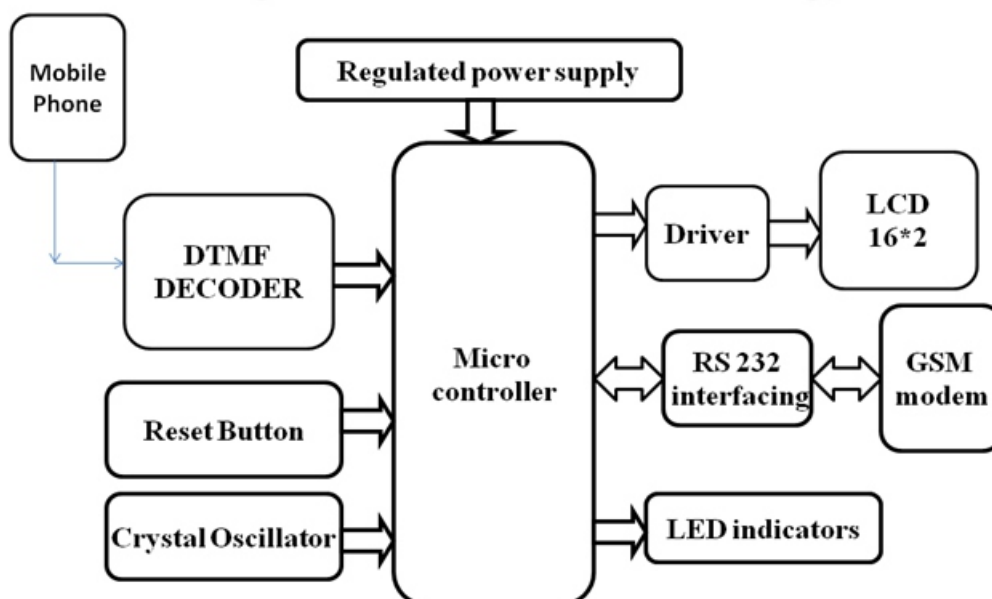
FIG :   Block diagram of An Embedded Interface for CAR security using GSM and DTMF technology

The main blocks of this project are:
1. Micro controller (AT89S52)
2. Reset button
3. Crystal oscillator
4. Regulated power supply (RPS)
5. LED indicator.
6. GSM modem.
7. DTMF DECODER.
8. LCD

Micro controller (AT89S52):

Microprocessors and microcontrollers are widely used in embedded systems products. Microcontroller is a programmable device. A microcontroller has a CPU in addition to a fixed amount of RAM, ROM, I/O ports and a timer embedded all on a single chip. The fixed amount of on-chip ROM, RAM and number of I/O ports in microcontrollers makes them ideal for many applications in which cost and space are critical. The AT89s52 is a low-voltage, high-performance CMOS 8-bit microcomputer with 8K bytes of Flash programmable memory.

The device is manufactured using Atmel's high density nonvolatile memory technology and is compatible with the industry-standard MCS-51 instruction set. The on chip flash allows the program memory to be reprogrammed in system or by a conventional non volatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel AT89s52 is a powerful microcomputer, which provides a highly flexible and cost-effective solution to many embedded control applications. In addition, the AT89s52 is designed with static logic for operation down to zero frequency and supports two software selectable power saving modes. The Idle Mode stops the CPU while allowing the RAM, timer/counters, serial port and interrupt system to continue functioning. The power-down mode saves the RAM contents but freezes the oscillator disabling all other chip functions until the next hardware reset.

Regulated power supply (RPS):

Power supply is a supply of electrical power. A device or system that supplies electrical or other types of energy to an output load or group of loads is called a power supply unit or PSU.

The term is most commonly applied to electrical energy supplies, less often to mechanical ones, and rarely to others.

REGULATED POWER SUPPLY
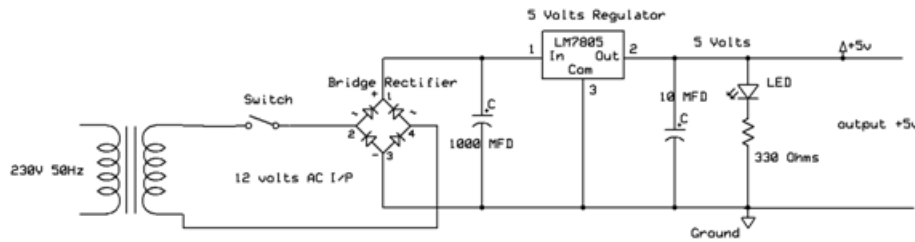
LED Indicator:

The structure of the LED light is completely different than that of the light bulb. Amazingly, the LED has a simple and strong structure. The light-emitting semiconductor material is what determines the LED's color. The LED is based on the semiconductor diode.

GSM Modem:

GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900 MHz. It is estimated that many countries outside of Europe will join the GSM partnership.
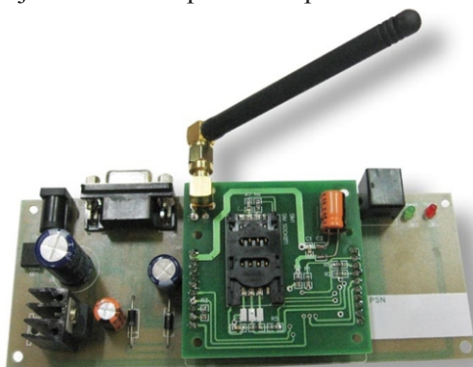
Modem Specifications:

The SIM300 is a complete Tri-band GSM solution in a compact plug-in module.Featuring an industry-standard interface, the SIM300 delivers GSM/GPRS900/1800/1900Mhz performance for voice, SMS, data and Fax in a small form factor and with low power consumption.The leading features of SIM300 make it deal fir virtually unlimited application, such as WLL applications (Fixed Cellular Terminal), M2M application, handheld devices and much more.

Dual Tone Multiple Frequency (DTMF) Decoder:

DTMF Decoder is also used for receiving data transmissions over the air in amateur radio frequency bands. The following are the frequencies used for the DTMF (dual-tone, multi-frequency) system, which is also referred to as tone dialing. The signal is encoded as a pair of sinusoidal (sine wave) tones from the table below which are mixed with each other. DTMF is used by most PSTN (public switched telephone networks) systems for number dialing, and is also used for voice-response systems such as telephone banking and sometimes over private radio networks to provide signaling and transferring of small amounts of data. DTMF decoder connected to GSM module.

Features of DTMF decoder:

* Complete DTMF Receiver
* Low power consumption
* Internal gain setting amplifier
* Adjustable guard time

* Central office quality
* Power-down mode
* Inhibit mode
* Backward compatible with MT8870C/MT8870C-1

Lcd Display:

One of the most common devices attached to a micro controller is an LCD display. Some of the most common LCD's connected to the many microcontrollers are 16x2 and 20x2 displays.

This means 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.

LCD Pin diagram:
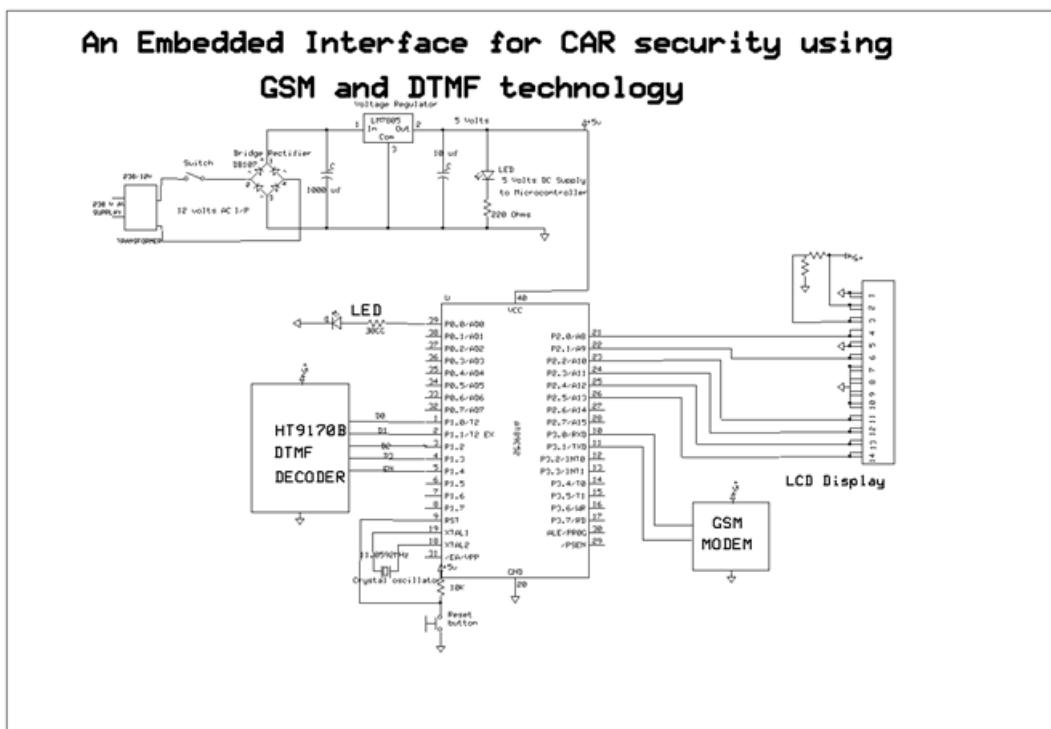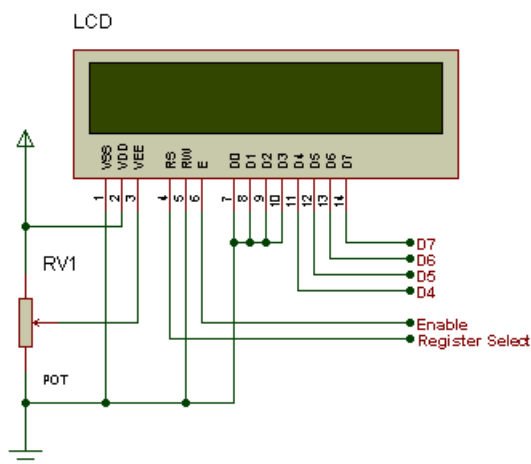
Fig : schematic diagram of An Embedded Interface for CAR security using GSM and DTMF Technology

The above schematic diagram An Embedded Interface for CAR security using GSM and DTMF technology explains the interfacing section of each component with micro controller and GSM modem which is to be identified according to the user requirement.

Crystal oscillator connected to 13th and 14th pins of micro controller and regulated power supply is also connected to micro controller and LED's also connected to micro controller through resistors.

Advantages:

1. Code based security acess system
2. Highly efficient and user friendly design.
3. Owner number Registration acess.
4. Easy to operate.
5. Low power consumption.
6. Works anywhere in the world (GSM availability).
7. Incase of emergency intimation (theft) can be sent to predefined numbers.

Disadvantages:

1.Modem should be properly installed for proper working of the system.
2.Poor network signal can decrease the performance of system.

Applications:

1.Any automobiles like car, vans, and heavy vehicles.
2.Military vehicle security at warfields at boarders.
3.VIP vehicle access and control.
4.Office cab monitoring and alerting in case of accident situations.
5.Vehicle Security Applications.

Result:

The project An Embedded Interface for CAR security using GSM and DTMF technology was designed such that high security for cars using GSM and DTMF Technology through embedded network. This system has provides password based security access through user mobile phone using DTMF decoder, if password is matched then embedded controller checks the password and gives access signal to car ignition ON, if password wrongs this system send alert message immediately to preloaded number (owner) using GSM,So the we can provide more security for automobiles.

Conclusion:

Integrating features of all the hardware components used have been developed in it. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. Secondly, using highly advanced IC's with the help of growing technology, the project has been successfully implemented. Thus the project has been successfully designed and tested.

Future Scope:

Our project "An Embedded Interface for CAR security using GSM and DTMF technology" is mainly intended to design an high security for automoble industry using GSM and DTMF technology.whenever any unauthorized entry is trying to open the car door then this sytem send alert message to owner mobile directly also access the car ignition through wielessly using mobile phone.

This project can be extended using high efficiency GPS receiver, LCD Display, multiple advanced sensos and a GPRS module. The GPRS module gives the intimation of the through predefined web link so that we can track the vehicle status immediately when theft or accident occurred to internet directly whereever in the world.

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