

## **Anti-Theft Security System Victimization GSM Networks with Text Message Supported Microcontroller**

**Sudhireddy Shilpa**

M.Tech (ES) Student

Chilukur Balaji Institute of Technology,  
Hyderabad, Telangana, India.

**N.Ashok**

Assistant Professor

Chilukur Balaji Institute of Technology,  
Hyderabad, Telangana, India.

### **ABSTRACT:**

*Vehicle security is that the major concern currently a day's. Vehicle makers try and modify security system by implementing completely different technologies. Presently central lockup system and conjointly thieving detection system is offered within the vehicle these will alert Vehicle owner for thieving detection. The developed instrument is AN embedded system supported GSM technology. The instrument is put in within the engine of the vehicle. Interfacing GSM electronic equipment is additionally connected to the microcontroller to send the message to the owner's mobile. This currently makes it not possible for anybody thus starts the automobile, not to mention moving with it. In a shot of thieving through the automobile doors or boot, the system sends text message to the automobile owner and at an equivalent time starts up an alarm. This style popped out owing to the increasing rate at that packed cars are taken particularly in our country, however with this style this packed automobile is being monitored no matter wherever it's packed, provided there's GSM network coverage. If the user fails to enter the proper watchword in 3 trials, a text message is shipped to the owner's mobile with vehicle location victimization GPS. Additional the association to fuel gadget of the automobile is deactivated in order that unauthorized person cannot begin the vehicle anyhow. This technique deals with the idea of network security. The most idea during this style is introducing the mobile communications into the embedded system. The complete designed unit is on one board.*

**Keywords:** - Vehicle security, GSM, Text Message, GPS, Networks.

### **I. INTRODUCTION**

In of late, automobile thefts square measure increasing at a frightening rate everywhere the planet. Thus to flee from these thieves most of the vehicle house owners have started mistreatment the thieving management systems. The commercially obtainable anti-theft conveyance systems square measure terribly costly. Automotive central protection system offers the simplest guarantee. An automotive with central protection security system helps the user to lock and unlock. Once more this technique couldn't sway give complete security of the vehicle just in case of thieving. Here, we tend to build an endeavor to develop AN instrument supported ATmega328 microcontroller and operated mistreatment GSM technology. The instrument may be an easy and low value vehicle thieving management embedded system.

GSM is that the hottest accepted customary for mobile phones within the world. This device uses the ARM seven microcontrollers which is able to interface to alternative peripheral devices like GSM, GPS, RFID reader, measuring device detector etc. The international System for Mobile communications (GSM) is that the hottest and accepted customary for mobile phones within the world established in 1982 and it operates in 900 rate frequencies. Over billion individuals use GSM service across the planet. The utility of the GSM customary makes international roaming quite common between movable operators, facultative subscribers to use their phones in several components of the planet. GSM differs considerably from its predecessors in each communication and speech clarity, as its channels is digitized. It implies

that the GSM system is currently thought-about as a 3rd generation (3G) mobile communication system.

## II. LITERATURE SURVEY

The existing automotive anti-theft systems square measure automotive alarm, flashing lightweight techniques that creates use of various varieties of sensors i.e. pressure, tilt and shock & door sensors, however the drawbacks square measure value and it will solely forestall the vehicle from thieving however can't be accustomed trace the crook.

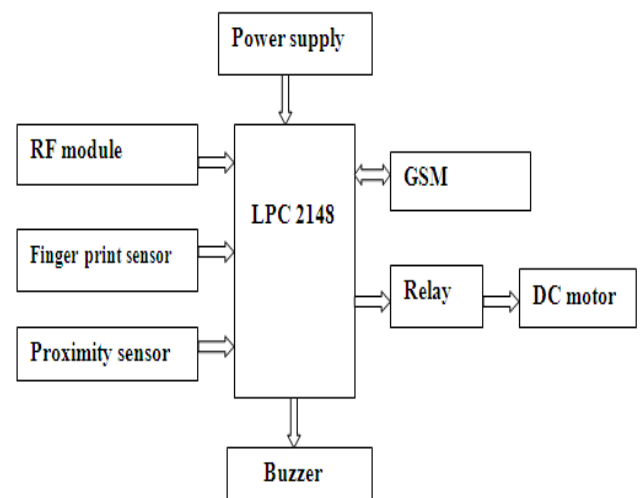
In 1997 B Webb introduced wheel and steering lock system, to forestall automotive from thieving, however they're visible from outside the automotive and forestall the wheel from being turned over some degrees. Consequent system was projected on Security Module for automotive Appliances by Pang-Chieh Wang, et.al. This technique prevents automotive appliances from stealing and contraband use on alternative cars. If any contraband moving and use the automotive appliance with the protection module while not permission occur which will lead the appliance to useless? However it doesn't forestall vehicle from thieving.

In 2008 Lili Wan, enforced new system supported GSM within which owner will receive the alarm message quickly and if necessary, additionally it will monitor the automotive by phone. Consequent system was a detector network primarily based vehicle anti thieving System (SVATS), beginning is that uses a detector network by mistreatment the sensors for the vehicles place inside identical lot, to watch and establish doable vehicle thefts by sleuthing unauthorized vehicle movement. AN alert are according to a base station within the lot if AN unauthorized movement is detected. Because the detector cannot communicate with the bottom station directly within the extreme case, vehicle cannot receive any protection once no neighbors are often found.

## III. SYSTEM ARCHITECTURE

The high level diagram of "Multi level anti thieving security system mistreatment GSM technology" contains of AN ARM7 small controller GSM network, RF module, fingerprint detector, proximity detector, Buzzer, relay and DC motor as shown in figure a pair of.1.

The ARM (LPC2148) small controller may be a 64-pin IC that is that the brain and negative feedback circuit behind the whole style consisting of a twelve rate oscillator and 2 serial ports. GSM is interfaced to the controller through interface (UART0), Fingerprint module is interfaced to the controller through interface (UART1) and liquid crystal display (LIGUID CRYSTAL DISPLAY) is employed to display the info. All the opposite modules square measure interfaced to the controller through I/O pins.



**Figure1: Block diagram of the system**

### MICROCONTROLLER:

Microcontroller used here is ARM7-LPC2148 microcontroller. It's a 128-bit wide memory interface and distinctive accelerator design alters 32-bit code execution at the utmost clock rate. The 16-bit Thumb mode reduces code by over half-hour with bottom performance penalty. Attributable to their little size and low power consumption, LPC2141/42/44/46/48 is right for applications wherever miniaturization may be a key demand, like access management. Serial

communication interfaces starting from a USB a pair of.0 full speed device, multiple UARTs, SPI, SSP to I2C-bus and on-chip SRAM of eight K up to forty K also are obtainable. Its fine fitted to communication gateways and protocol converters, soft modems, voice recognition and low finish imaging, providing massive buffer size. many 32-bit timers, single or twin 10-bit digitizer (s), 10-bit digital-analog converter, Pulse-width modulation channels and forty five quick general input/output lines with up to 9 edge or level sensitive external interrupt pins build these microcontrollers appropriate for industrial management and medical systems.



**Figure2: Block Diagram for LPC214X**

**RF MODULE:**

RF module is right for device applications. The transmitter operates from one.5-12V provide, creating it ideal for powered applications and wherever low value and longer vary is needed. The receiver module needs no external RF elements aside from the antenna. It generates just about no emissions, used for top volume applications.

**FINGERPRINT MODULE:**

It adopts optic fingerprint detector that consists of superior DSP and Flash. Fingerprint detector Module is in a position to conduct fingerprint image process. It's accustomed perform fingerprint enroll and verification for added security.

**PROXIMITY SENSOR:**

The system has AN inductive proximity detector that detects the presence of metal objects that come back inside vary of their periodical field and supply target detection to "zero speed". Once the secret is inserted

within the key hole the inductive proximity detector detects the key and sends signal to the microcontroller, once that ignition is enabled.

**GSM MODULE:**

GSM is that the most well-liked technology within the world. The name GSM initial comes from a bunch known as cluster Special Mobile (GSM) that was fashioned in 1982 by the Conference of Post and Telecommunications Administrations (CEPT) to develop a pan-European cellular system. That might replace the various existing incompatible cellular systems. Once GSM service started in 1991, the abbreviation "GSM" was renamed to international System for Mobile Communications. GSM uses Frequency Division Multiplexing and Time Division Multiplexing. FDMA divides the frequency ranges for GSM that are 890-915, 935-960. Module used here is S2-1040W-Z0936 (SIM 900A)

The GSM network will be divided into 3 components

- i. Mobile Station
- ii. Base Station
- iii. Network scheme



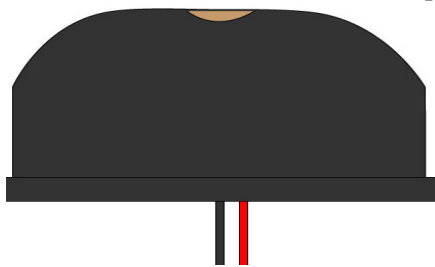
**Figure3: GPS modem**

The mobile station consists of mobile instrumentality and a Subscriber Identity Module. The foremost common mobile instrumentality is that the transportable. By inserting the SIM card into phone, the user is ready to receive calls at that phone, create calls from that phone, or receive different services. The mobile instrumentality unambiguously identifies the International Mobile instrumentality Identity. The

bottom Station scheme consists of the bottom Transceiver Station and therefore the Base Station Controller.

**BUZZER:**

The Pb series are superior buzzers. They exhibit very low power consumption compared to magnetism units. They created while not change contacts to make sure long life with no electrical noise and are compact.



**Figure4: Image of buzzer**

**DC MOTOR:**

A DC motor consists of a rotor and a permanent magnetic flux mechanical device. Who's maintained by victimization either permanent magnets or magnetism windings. DC motors ar most ordinarily utilized in variable speed and torsion applications.



**Figure5: DC Motor**

**SERIAL ENCODER/DECODER:**

The foremost standard serial encoder/decoder used is that the HT12E-HT12D tries. Their description is given below.

The HT12E Encoder ICs ar series of CMOS LSIs for device system applications. They're capable of encryption twelve little bit of data that consists of N address bits and 12-N information bits.

**LCD MODULE:**

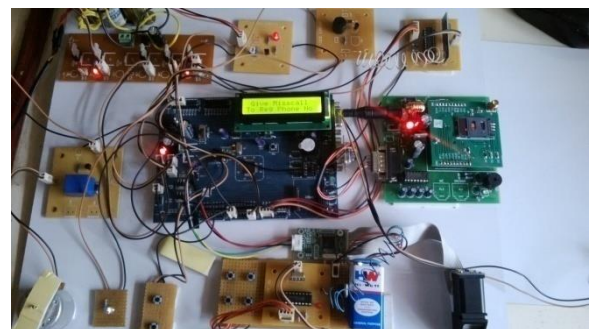
To show interactive messages we tend to are victimization alphanumeric display Module. We tend to examine associate degree intelligent LCD display of 2 lines, sixteen characters per line that's interfaced to the controllers. The protocol (handshaking) for the show is as shown. Liquid show additionally known as alphanumeric display is extremely useful in providing interface also as for debugging purpose. The foremost common form of alphanumeric display controller is HITACHI 44780 that provides a straightforward interface between the controller & associate degree alphanumeric display. These LCD's are terribly straightforward to interface with the controller also as are value effective.



**Figure6: 2x16 Line Alphanumeric LCD Display**

**IV. HARDWARE DESIGN**

In this section we tend to are interfacing microcontroller to coordinate the whole system.



**Figure7: Multi level Anti-Theft security system using GSM**

The system consists of RF transmitter, that contains four switches, through that user enters the key countersign .This entered countersign is then received

by RF receiver. RF transmitter is battery power-driven and is placed on automobile key of the owner [6].

Power offer is interfaced to provide 5V supply to ARM7 and to different modules within the system. RF receiver is interfaced to microcontroller Port (0.4 - 0.7) to receive four bit information from transmitter. Finger print device is interfaced to Port (0.8-0.9) for finger print authentication within the second level. DC motor is interfaced to Port (0.15) through relay for ignition. GSM is interfaced to controller through UART0. buzzer is interfaced to Port (1.31) to initiate alarm just in case finger print verification is unauthorized. Inductive proximity device is interfaced to Port (1.30) to sense the key throughout insertion. 2 switches are interfaced to the controller Port (1.28-1.29). That is used for enrolling and valedictory finger prints.

#### WORKING PROCESS:

The embedded system put in within the engine of the vehicle at the side of the GSM electronic equipment. By getting into an accurate countersign (like: \*abcd) the instrument permits to activate the 12V relay and so ignition of the engine can begin. Thus begin the vehicle. If anyone tries to enter the countersign every which way, then when 3 trials, the ARM can block the entry of any countersign. Then, the buzzer can turned on to form a noise to panic the wrongdoer, followed by causing a message "Alert: automobile is below Threat" through GSM electronic equipment to the owner's mobile for any action for bar of his vehicle.

#### V. SOFTWARE SPECIFICATION

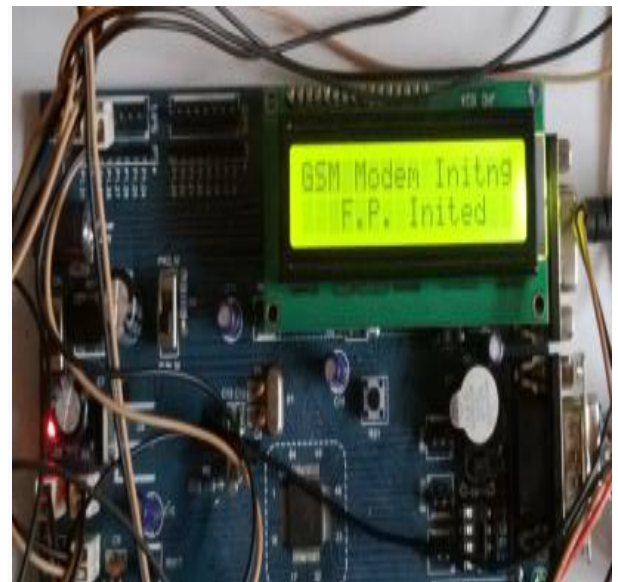
Keil was based in 1986 to plug add-on merchandise for the event tools. it's provided by several of the semiconductor vendors. The Keil generates code for any device that's compatible with the 8051, 251, C16x/ST10, or ARM microcontrollers. The exception to the current would be a tool that has removed or modified the instruction set. However, that device would now not be a compatible half. After we begin project victimization the Keil uVision integrated development surroundings, we tend to should choose a

chip from info. Keil perpetually updates the info. to make sure that we tend to perpetually have the most recent info, we tend to might transfer the recent updates from the Keil web site. The programming will be done by victimization 'embedded C.

#### VI. RESULT ANALYSIS

This Anti-Theft security system for cars victimization GSM that tries to shield the vehicle from thievery by suggests that of multiple levels of security. LPC2148 Microcontroller is interfaced to GSM (through serial cable), RF module, Fingerprint device, proximity device, Buzzer, alphanumeric display and DC motor (through Relay circuit).

For demonstration purpose proximity device is employed to sense the metal object (key in real time) once inserted when fingerprint verification. DC motor is employed as ignition and is operated by a Relay switch.



**Figure8: Initialization of Multilevel Anti-Theft security system**

For formatting of GSM system the user will offer misname to the system to register the mobile range. Then the system provides message to the genuine or registered mobile range.



**Figure9 (a) Initialization of GSM, (b) Conformation message is received**



**Figure10: Finger print enrolling**

After GSM formatting the system enroll the fingerprints for subsequent authentication operations.

**Level 1:**

To unlock the automobile, a secret countersign is needed from the user. If the entered countersign is correct then the system goes to next security level i.e. Fingerprint verification.

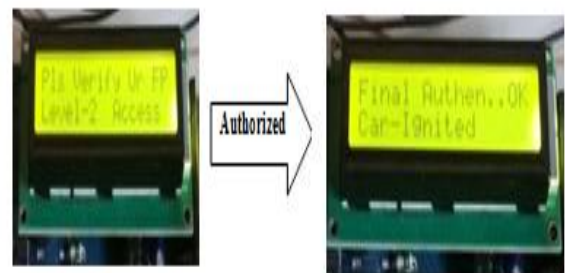


**Figure 11 :(a) Level 1 authentication (b) Conformation message is displayed if level1 authentication is success**

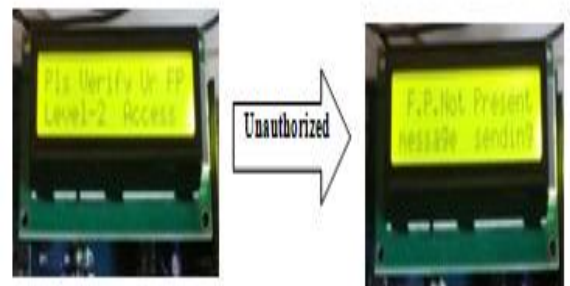
If the countersign entered at Level1 doesn't match with the present countersign, then a text message is distributed to the owner that “password entered at level one is unauthorized “shown in figure four.11.

**Level 2:**

At level a pair of finger print verification of user is finished. Just in case it matches with the keep fingerprints, then the system activate the ignition.



**Figure 12: (a) Level2 authentication if verification result is authorized**



**Figure 12: (b) Level2 authentication if verification result is unauthorized**

Otherwise if finger print isn't gift then the system disable the ignition and sent a text message to the owner regarding “finger print authentication at level2 is unauthorized” as shown in figure four.4.7 and at identical time alarm is enabled.

When associate degree unauthorized person attempting to access the automobile, then the system sends a text message to the owner mobile at level1 & level2 is shown in figure five.6.



**Figure 13: Alert messages to the mobile at level1 & level2**

**Level 3:**

Just in case if a acknowledged person to owner needs to use the automobile, then the person should bear the third level of security. Within which owner grants access to the automobile by causing a text message to the system.



**Fig (a)**

**Figure 14: (a) Level3 authentication waiting for final authentication message from owner (b). Please insert key if the message is received from the owners mobile.**

At third level of security, access to the vehicle is provided to the one who is thought to owner and whose fingerprint isn't keep in memory by simply

causing a secret text message to the system. When that the access to automobile is grant to the acknowledged person. "Please insert key" is displayed, in order that user will begin the automobile.

**VII. CONCLUSION AND FUTURE SCOPE**

Where there's high level of larceny, there's would like for higher security system for vehicles. This project deals with the planning & development of a larceny system is employed to forestall or management the larceny of a automotive. This technique improves vehicle security and accessibility with the employment of GSM technology and biometry.

During this project the safety system relies on embedded management that provides security against larceny. The GSM electronic equipment is employed to send the alert messages to the owner instantly once Associate in Nursing unauthorized person attempting to access the automotive. This can be reliable and economical system for providing high level security to the vehicles through GSM and biometry. By putting in this technique in automobiles Associate in nursing unknown person cannot begin the car. The simulation of the circuit style and its implementation is finished victimization KEIL IDE software package and Flash magic tool. This style are often created additional increased in future to support cameras and additionally GPS system are often else to stay the track of the vehicle.

**REFERENCES:**

[1] Priti k.powale, Real time Car Antitheft System with Accident Detection using AVR Microcontroller, International Journal of Advance Research in Computer Science and Management Studies, Volume 2, Issue 1, January 2014.

[2] Microcontroller Based Anti-theft Security System Using GSM Networks with Text Message as Feedback, International Journal of Engineering Research and Developments-ISSN: 2278-067X, p-ISSN: 2278-800X, volume 2, Issue 10 (August 2012), PP. 18-22

[3] B Webb “Steering Column Locks and Motor Vehicle Theft: Evaluations From Three Countries” Situational crime prevention: Successful case studies, 1997.

[4] Pang-Chieh Wang, Ting-Wei Hou, Jung-Hsuan Wu, and Bo-Chiuan Chen “A Security Module for Car Appliances” International Journal of Aerospace and Mechanical Engineering 2007.

[5] Lili Wan, Tiejun Chen “Automobile Anti-theft System Design based on GSM” International Conference on Advanced Computer Control 2008

[6] H Song, S Zhu, G Cao “ SVATS: A Sensor network based Vehicle” INFOCOM The 27th Conference on Computer Communications. 2008

[7] Montaser N. Ramadan, Mohammad A. Al-Khedher, and Sharaf A. Al-Khede “Intelligent Anti-Theft and Tracking System for Automobiles” International Journal Machine Learning and Computing, Vol. 2, No. 1, February 2012.

[8] D.Narendar Singh, K.Tejaswi, “Real Time Vehicle Theft Identity and Control System Based on ARM 9” International Journal of Latest Trends in Engineering an Technology (IJLTET),Vol. 2 ,Issue 1, January 2013.

[9] S. P. Pingat, Shubham Rakhecha, Rishabh Agrawal, Sarika Mhetre, Pranay Raushan, Smart Car Security System by Using Biometrics, International Journal of Innovative Technology and Exploring Engineering (IJITEE) ISSN: 2278-3075, Volume-2, Issue-4, March 2013.