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DESIGN OF GSM CELL-PHONE BASED VEHICLE MONITORING & THEFT SECURITY SYSTEM

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Abstract:- This project will focus on developing and enhancement of vehicle security system. In this project involve both hardware and software parts to construction and the integrate to create the system. There are various type of method such as GSM and GPS system. GPS is used to locate the position of vehicle and GSM is used to alarm security system to send the SMS. Both system gives report and status of the moving vehicle. GSM and GPS system operating through the satellite and people are mainly concerned about vehicle theft and fuel theft. So in this project we involved three circuit. Which is secure to the vehicle such as key ignition, fuel and stand. Fuel level monitoring is a microcontroller is based method. When key ignition system started GSM modem send the SMS to the owner. The owner can be responds when the SMS and interfacing of both the module that is GSM and GPS is done with the microcontroller which is in turn, connected to engine. This is more secured and reliable

Index term : Global Positioning system(GPS),Global system for mobile communication(GSM), A GSM Cell Phone, Microcontroller, Key ignition ,Stand switch, Fuel switch.

I. INTRODUCTION

Now a days security of our vehicles has become important issue. There are two main issues which people are mainly concerned about one vehicle theft and other fuel theft. If we are parking our vehicle at unknown place we feel insecurity about our vehicle. Even if we are parking our vehicle in paid parking are we are not sure about safety of our vehicle or its fuel. Specially for bikes it is very easy to steal petrol from it. Also if by some means unauthorized person steals the vehicle user will be given information by messaging system. Also user should be provided the position of vehicle it is stolen by using GPS modules. A GSM modem is a specialized type of modem which accepts a SIM card, an operates over a subscription to a mobile

operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone .In GSM modem used here as SIM 800 module. Microcontroller identifies the signal and accordingly send the SMS to the registered mobile Number using GSM modem. A GPS navigation device, GPS receiver, or simply GPS is a device that is capable of receiving information from GPS satellites and then to calculate the device's geographical position. In GPS used in cars, cabs ,ambulance and police are common sights on the road of the developed countries. In GPS vehicle tracking using ensures their safety as travelling. The GPS and GSM is based system one of the most important system integrate both GPS and GSM technology. There is a timer circuit base on a advance AT98C52 microcontroller which is connected to an IR receiver .In this project three circuits are used fuel, stand, key. These three are connected to microcontroller and microcontroller gives signal to GSM and GPS module

II. RELATED WORK

Whenever someone wants to stole vehicle then the system which is feed in vehicle sends the SMS to the owner of the vehicle then the owner wants to turf off the ignition of vehicle. The user can send a message from a cell phone as soon as the GSM module get the message and if found to be valid it will immediately send the details of the locations, So that the user can get to know exact location of vehicle. If the fuel is below the range then the sensors sense it and send the SMS to the owner and the time buzzer is on.If the unauthorized person lifting your vehicle without turning on then the stand sensor send the signal to the microcontroller. At the same time the microcontroller send the message to vehicle owner where a user can get the exact location of vehicle pointed out on the Google map. It is a vehicle security device that offers excellent protection to your vehicle. Some more developed system makes use of an embedded system based on GSM technology. In this system the developed and designed is installed in the vehicle. One of the most Important concept this concept is introducing the mobile communication into the Embedded system. Your vehicle using duplicate keys by starting the ignition. Second is fuel theft specially for bikes it is easy to steal the fuel from them. Because there is fuel knob external to the bike. Third but not least, somebody may lift your two wheeler and put it in transport vehicle. For this we are going to use different sensors .If these sensors detect above conditions then they will give signals to the microcontroller. Accordingly microcontroller will sendthe message to the owner using GSM modem. Microcontroller cat get the location using GPS module connected to it. Many people has done this much work. But we will work for additional feature. If owner comes to know that his vehicle is being driven by wrong person that is it being stolen then owner can send the message “ENGINE OFF” to microcontroller through GSM modem Once the microcontroller receives the massage then the microcontroller switch off the engine using relay switch.

III. PROPOSED METHOD

There are many ways of mishandling the two wheelers. First somebody may try to steal.

A. BLOCK DIAGRAM

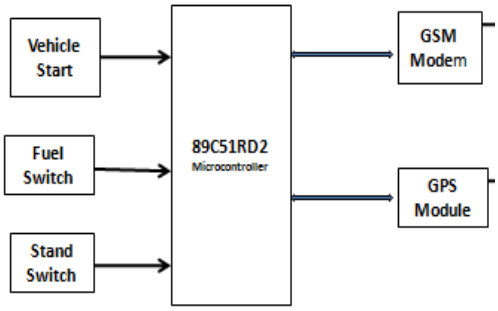


Fig 1,Block diagram

The Block diagram of Vehicle tracking and locking system based on GSM and GPS technology is shown in the figure1.

Microcontroller 89C51RD2: The microcontroller 89C51RD2 is 8 bit, 40 pin and belong to ATMEL'S 8051 family .8051 flash has programmable and erasable read only memory. In microcontroller 128 byte RAM and flash is 4KB,The number of timer is 2 and number of interrupt source is 6.The microcontroller gives two signal through AT command to GSM and GPS.

Vehicle start: Switch ON Vehicle using duplicate key or by whatever means. Which identifies mishandling of your vehicle.

Fuel Switch: Fuel theft by turning fuel switch to ON position (Specially for Bikes).Fuel level monitoring is a microcontroller is based method. Specially for bikes it is very easy to steal petrol from it.

Stand Switch: Lifting your vehicle without turning ON.

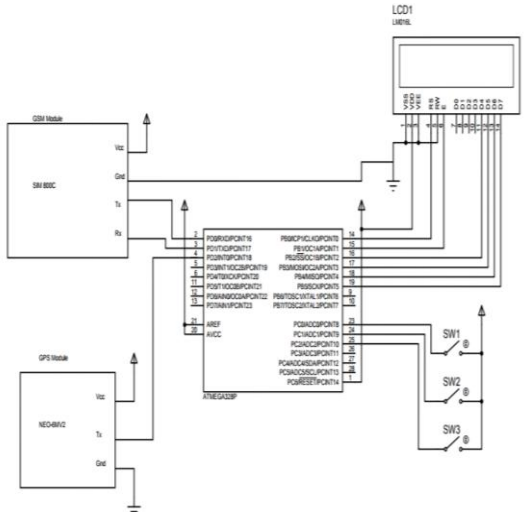
GPS: GPS is Global positioning system is spaced on radio-navigation system. GPS is a device that is capable of receiving information from GPS satellites and then to calculate the device's geographical position.

GSM: GSM is global system of mobile communication and it is digital telephony system and it is used to small text message. Two antennas are connected one is connect to GSM and another connect to GPS.

B. CIRCUIT DISCRIPTION

There are many ways of mishandling the two wheelers. First somebody may try to steal your vehicle using duplicate keys by starting the ignition. The power supply section is very important for all electronic circuits. The AT89C52 is a low power; high performance CMOS 8-bit microcomputer with 8 kb of Flash programmable and erasable read only memory (PEROM). The circuit diagram of the vehicle tracking and locking embedded system using GPS and GSM technology is shown in Fig.2. When send the SMS to controller, issues the control signals to the engine motor. Engine motor speed is gradually reduced and comes to the off position GPS, GSM, LCD and IC's are used in this Circuit. Firstly GSM are interface with LCD and GPS are directly interface with IC's. Port 0 is an 8-bit open-drain bi-directional I/O port. As an output port, each pin can sink eight TTL inputs. When 1s are written to port 0 pins, the pins can be used as high impedance inputs. Port 1 is an 8-bit bi-directional I/O port with internal pull ups. Port 2 is an 8-bit bi-directional I/O port with internal pull ups. Port 2 pins that are externally being pulled low will source current (IIL) because of the internal pull ups. Reset input. A high on this pin for two machine cycles while the oscillator is running resets the device. Address Latch Enable output pulse for latching the low byte of the address during accesses to external memory. Program Store Enable is the read strobe to external program memory. EA must be strapped to GND in order to enable the device to fetch code from external program memory locations starting at 0000H up to FFFFH. **XTAL1** Input to the inverting oscillator amplifier and input to the internal clock operating circuit. **XTAL2** Output from the inverting oscillator amplifier. On the chip are three lock bits which can be left programmed (U) or can be programmed (P) to obtain the additional

features.



C. SOFTWARE INTERFACE

1. Proteus software: The proteus are used in circuit. Proteus is a Virtual System Modelling (VSM) that combines circuit simulation, animated microprocessor and component models to co-simulate the complete microcontroller based designs. This is the perfect tool and component for engineers to test their microcontroller designs before constructing a physical prototype in real time. This program allows users to attract with the design using on-screen indicators and LED and LCD displays and if attached to the PC, switches and buttons.

2. Keil software: The software the hex and compile and build. Keil software , world's leading developer of embedded systems software. Microcontroller supports every level of software developer from the professional application engineer.

D. GPS TECHNOLOGY

The Global Positioning System (GPS) is a space based radio-navigation system consisting of constellation of satellites and a network of ground stations used for monitoring and control. The GPS is a constellation of satellites in orbit around the Earth which transmit their positions in space as well as the precise time. GPS receiver is used for this research work to detect the vehicle location and provide information to responsible person through GSM technology. Once the vehicle position has been determined, the GPS unit can determine other information like, speed, distance to destination, time and other. GPS unit can determine other information like, speed, distance to destination, time etc. once the vehicle position has been determined.

Fig. 3: GPS module

E. GSM MODEM

It is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone. The GSM modem is a specialized type of modem which accepts a SIM card operates on a subscriber's mobile number over

a network, just like a cellular phone.

Fig. 4: GSM module

Shorter development time, but the greater the cost as well. The factors to deliberate when choosing a debugging tool are cost, ease of use and the features offered during the debugging process. A software simulator is a computer program running on an sovereign hardware and it simulates the CPU, the instruction set and the I/O of the target microcontroller. Simulators offer the lowest-cost development tools for microcontroller-based systems and most companies propose their simulator programs free of charge.

F. FEATURES OF SIM 808 GPS /GSM

- Power Supply voltage 3.4V ˜ ˜ ˜ ˜ to 4.4V
- Low power consumption .
- GPRS multi-slot class 12/10.
- GPRS multi station class B.
- Size of 24*24*3mm.
- MT,MO,CB, TEXT and PDU mode
- SMS cell broadcast.
- The supports SIM card in SIM Interface 1.8V and 3V.
- USB interface can be used as debugging and testing
- In Serial port full modem interface with status and control line
- Jamming detection.
- The real time clock support RTC
- Control AT command.
- SIM 800 module complete quad band.

IV. DEBUGGING AND TESTING

A microcontroller-based system is a composite ctivity that necessitate hardware and software interfacing with the external world. Doing substantially design of a microcontroller-based system postulate skills to use the miscellany of debugging and testing tools available. The debugging and testing of microcontroller-based systems shared out into two groups: software-only tools and software-hardware tools. Software-only tools come as monitors and simulators, which are sovereign of the hardware under development. Software-hardware tools are normally hardware dependent, more expensive and range from in-circuit emulators and in-circuit simulators to in circuit debuggers. In general, the higher the level of integration with the target hardware, the greater the welfare of a tool, resulting in a The user program man user in a simulated environment where the user can insert breakpoints within the code to stop the code and then take apart the internal registers and memory, display and change the values of program variables and so on. Incorrect logic or errors in computations can take apart by stepping through the code in simulation. Simulators run at speeds 100 to 1000 times slower than the factual micro controller hardware and, thus, long time delays should avert when simulating a program. Micro controller based systems normally have interfaces to various external debugging.

A. HARDWARE UNIT

A GPS engine SR-87. The Pro Gin SR-87 series GPS modules merged high predisposition, high performance Si RF Star III chipset solution in a compact design. The module tracks up to 20 satellites at a time patch oblation fast time-to-first-fix and 1Hz navigation update. The unit is very desirable for broad applications such as Handheld, PDA, PPC or other battery operated navigation system. B. SIM808– a quad-band GSM/GPRS engine. The hardware interface of the SIMCOM SIM300 module associate to the specific application and the airinterface.SIM808 is a quad-band GSM/GPRS engine that works on frequencies EGSM 900 MHz, DCS 1800 MHz and PCS 1900 MHz V.

B. TESTING

The software code which is in C is to be compiled debugged and tested. The software PROTEUS ISIS is used to make the circuit design and then simulate it with the help of AVR Studio which assure the execution of C programs for different resources on AVR microcontroller. Also a PCB layout for the circuit implementation is created using PROTEUS ARES software.

V. CONCLUSION

This project stack with the design &development of a theft control system for an automobile, which existence used to preclude or control the theft of a vehicle. The simulation of the circuit design and its implementation is through using PROTEUS software. This system is designed to meliorate vehicle security and availability. With the use of wireless technology vehicle owners are capable to enter as well as protect their automobiles with more passive participation. Ideally, this project could be made more commodious and secure with the use of satellite modems as an alternative of cell phones as tracking device as the system may fail when there is no network coverage. This design can be made more enhanced in future to sponsor camera, handset phone / hands free, mobile data LCD display, web based tracking software, and also PC based stand alone software. In our project the security system is based on embedded control which supply security against theft. The GSM modem supply information to the user on his request. The owner can approach the position of the vehicle at any instant. He transmit a message in order to lock the vehicle. The GPS receiver on the kit will place the latitude and longitude of the vehicle using the satellite service. This is reliable and effective system for providing security to the vehicles through GSM, GPS and serial communication.

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