RESEARCH PAPER ON GSM BASED VEHICLE FUEL THEFT DETECTION SYSTEM WITH SMS INDICATION

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Abstract

In this paper we have focused on developing an enhancement of the vehicle alarm security system via SMS. The system will manipulate a mobile phone to send SMS. Even though the SMS can be sent using the features available in the mobile, the objective of this experiment is to activate the SMS sending by the mobile phone using external program connected physically to the mobile phone. Antitheft security system utilizes an embedded system designed with GSM to monitor and safeguard a car. In attempt of theft the system sends text message to the car owner and at the same time starts up an alarm from the buzzer installed within the system. The safety of vehicles fuel is extremely essential for public so this project came to our notice due to the alarming rate at which vehicles fuel are being stolen in our country and with this design our vehicle can also be monitored irrespective of where it is parked , provided there is a GSM network coverage. Our model (theft detector) uses very few electronic components and looks very small and compact and can be mounted on vehicles easily.

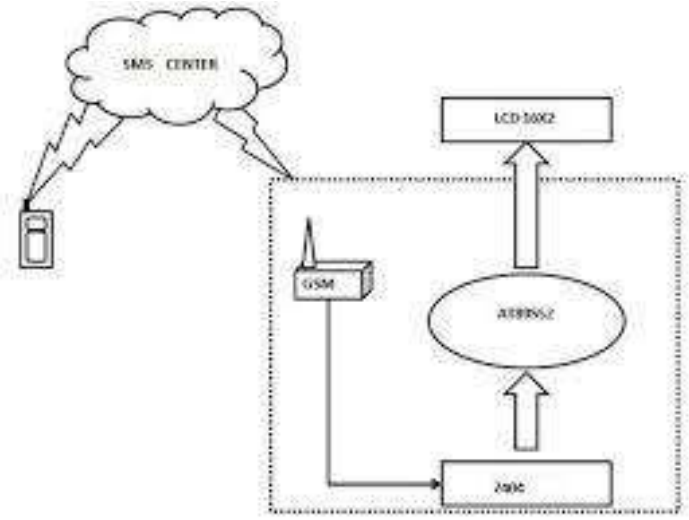
Keywords: GSM Technology, AT89S52 Microcontroller, LCD Display, IR sensor, GSM module.

1.INTRODUCTION

In the present days vehicle fuel theft is one of the main concerns of many bike owners and car owners. Many times we have heard or some of us have already faced that petrol from their bike or cars has been stolen. Main intention of this detector is to avoid such situation. A simple, cost-effective solution is proposed here, by which vehicles fuel security is maintained while the vehicle owner is anywhere across the globe. This model detector has a GSM modem which sends SMS to owner of vehicle when there is fuel theft going on.GSM based Vehicle Fuel Theft Detection System with SMS indication has application in Car, Bikes and all other vehicles. While implementing the model, we have used telecommunication, to be specific; SMS is integrated or improvised to the present vehicle security system [2]. Instead of human to human telecommunication, this system creates new entity which is machine to human telecommunication [9]. Technology already tracks or monitors animals, people, vehicles and other objects to eliminate the need for constant human observation [8]. These technologies need to be small, economical and consume a minimal amount of power. GSM technology is being used extensively in hand-held devices and wireless computing because of its characteristics [6]. This project aims to use GSM technology to monitor security of fuel. This system is an upgrading and improving vehicle security system by integrating SMS features to alert vehicle owners whenever intrusion occurs. The study of telecommunication is an interesting field because it involves digital signal processing, signal and systems, programming and more [1]. This inspires people to improvise the technology into daily use. The system is made up of a GSM modem, AT89S52 microcontroller, LCD16X2 and a power supply Unit. The Fuel Detector involves hardware and software parts construction and the integration of both parts to create the system.

2. SYSTEM ARCHITECTURE

The figure above shows how the interfacing of the GSM with microcontroller. The GSM module is for communication between the microcontrollers with mobile phones through UART. To communicate over UART or USART, we just need three basic signals which are namely, R_XD (receive), T_XD (transmit), GND (common ground).GSM modem interfaces with microcontroller for SMS. Text message may be sent through the modem by interfacing only three signals of the serial interface of modem with microcontroller i.e., T_XD, R_XD and GND.

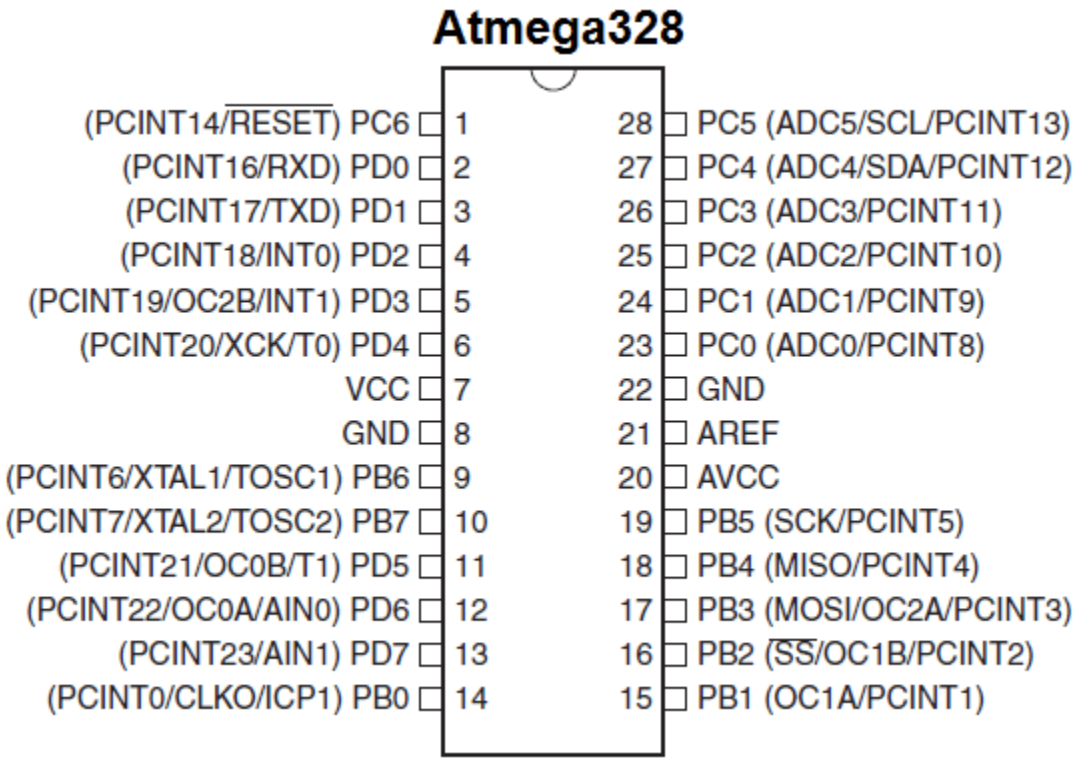


The transmit signal of serial port of microcontroller is connected with transmit signal (T_XD) of the serial interface of GSM Modem while receive signal of microcontroller serial port is connected with receive signal (R_XD) of serial interface of GSM Modem.

1. The complexity of coding substantially increases, but once programmed the module works at its robust best since it is a dedicated embedded system and not a general purpose computer. The design procedure involves identifying and assembling all the required hardware and ensuring safe interfacing between all the components. Then we have the coding process which has to take care of the delays between two successive transmissions. The limiting constraint is the RAM of the microcontroller rather than the coding-complexities. This is an important block at the input side of microcontroller. The function of liquid level is to detect the variation in fuel level and it gives variable output voltage as per the variations in level. This liquid level sensor can be used for any type of liquid. So it can be used for petrol as well as diesel or in some cases it can be used for water level detection as well. ADC is analog to digital converter. Output of level sensor is in analog form and the 8051 microcontroller is not able to read the analog voltage signal, so we have used analog to digital converter. ADC reads the analog input voltage and gives digital output data which is corresponding to the analog data received. The output of ADC is 8bit format which is compatible to the microcontroller. ADC is analog to digital converter. Output of level sensor is in analog form and the 8051 microcontroller is not able to read the analog voltage signal, so we have used analog to digital converter. ADC reads the analog input voltage and gives digital output data which is corresponding to the analog data received. The output of ADC is 8bit format which is compatible to the microcontroller. It is known as Liquid Crystal Display. It displays various messages like “Ignition key inserted”, “Ignition key removed”, “Petrol theft is in progress”, “Sending SMS”, “SMS send successfully”. It also displays variation in petrol level. We have used 16 by 2 alphanumeric display. LCD is mainly important for testing the project, however in actual use LCD is optional.Buzzer plays very important role in our project. A buzzer is turned on whenever petrol theft is going on or petrol is stolen. Buzzer will be turned on as soon as there is decrease in petrol level without ignition key. Loud noise of buzzer will draw attention of persons in the surrounding so they can come to know that something wrong is happening with the bike.

2. This can save further fuel theft. We have used 12 volt buzzer for demonstration purpose.GSM modem is used to send messages to the owner of the car or bike.We have to insert a GSM simcard into this GSM

modem. Microcontroller sends the commands for sending SMS to the GSM modem. These commands are sent through serial communication port. This technology is used because many times we go to the multiplex or theater or shopping mall and we park car on the road or in the parking area so we are not near the car or the bike. Whenever petrol theft is going on user will get SMS and user can rush to the bike or car to check the safety of bike.



1. ATMEGA328P – Simplified Features

CPU	8-bit AVR
Number of Pins	28
Operating Voltage (V)	+1.8 V TO +5.5V
Number of programmable I/O lines	23
Communication Interface	Master/Slave SPI Serial Interface(17,18,19 PINS) [Can be used for programming this controller] Programmable Serial USART(2,3 PINS) [Can be used for programming this controller] Two-wire Serial Interface(27,28 PINS)[Can be used to connect peripheral devices like Servos, sensors and memory devices]

JTAG Interface	Not available
ADC Module	6channels, 10-bit resolution ADC
Timer Module	Two 8-bit counters with Separate Presale and compare mode, One 16-bit counter with Separate Prescaler,compare mode and capture mode.
Analog Comparators	1(12,13 PINS)
DAC Module	Nil
PWM channels	6
External Oscillator	0-4MHz @ 1.8V to 5.5V 0-10MHz @ 2.7V to 5.5V 0-20MHz @ 4.5V to 5.5V
Internal Oscillator	8MHz Calibrated Internal Oscillator
Program Memory Type	Flash
Program Memory or Flash memory	32Kbytes[10000 write/erase cycles]
CPU Speed	1MIPS for 1MHz
RAM	2Kbytes Internal SRAM
EEPROM	1Kbytes EEPROM
Watchdog Timer	Programmable Watchdog Timer with Separate On-chipOscillator
Program Lock	Yes
Power Save Modes	Six Modes[Idle, ADC Noise Reduction, Power-save, Power-down, Standby and Extended Standby]
Operating Temperature	-40°C to +105°C(+105 being absolute maximum, -40 being absolute minimum)

3. CONCLUSION

The system makes use of an embedded system based on the GSM technology. An interfacing mobile is connected to the microcontroller. When a person attempts fuel theft then the microcontroller commands the

GSM modem to send a text message as an alert to the vehicle owner and further an alarm is raised by the buzzer installed within the system. In this system we interfaced the microcontroller AT89S52 with SIM 900A modem to decode the message. The proposed rule also avoids the other way to fuel theft of fuel tank fault detection system. The numeric lock system is to open authentication for the fuel in the vehicle fuel tank. Finally the system at any time. The wireless technology will enable the vehicle owner, the vehicle with the mobile phone of monitor anywhere, anytime.

4. REFRENCE

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