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

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Abstract

This paper presents the design and structure for with growing the values of oil, fuel theft has become very common incidence. From economical point of view a system is derived that will take care of the practices. This system makes use of smart fuel theft detection with GSM alert. Using the ARM7microcontroller, the real time position of vehicles and its fuel content is sent to owners mobile in case of intrusion. The system includes microcontroller, GSM modules . The microcontroller that converts the data which sent to the user in text format. This smart system gives 24*7 access to fuel consumption alert when fuel drains and storage tank leak immediately identified.

Keywords— GSM Modules, microcontroller, buzzer, battery

1.INTRODUCTION

All internal combustion engines sequentially on liquid fuel have to be very fuel effective from economic point of assessment. All these engines are prepared with most forward-thinking automated fuel indication devices. These are system built devices. There should be some provision at the user level to know the quantity of fuel at all times. The care and safety of fuel is of utmost importance. In the recent years, escalating oil demands and costs of fuel are increasing. This indirectly increases the overheads of many businesses and those with large vehicle fleets. Global oil source and request forecasts for 2015 have altered knowingly just, but these changes have mostly cancelled each other out: the outlook is still one of a market unevenly in balance. However, it is at times of rapid market change that forecasting become most difficult.

In July of 2014, earlier crude prices distorted forecasts from the International Energy Agency, US Energy Information Administration and OPEC recommended that world oil request would increase by about1.35 million b/d in 2015 and that the global supply/demand balance would be very slightly positive. most difficult. In July of 2014, earlier crude prices collapsed, forecasts from the International Energy Agency, US Energy Information Administration and OPEC suggested that world oil request would upswing by about1.35 million b/d in 2015 and that the global supply/demand balance would be very slightly positive. To provide the needs of fuel savings due to a one of the few above mentioned problems, the SIM 900 GSM module is used over a Global System for Mobile Communications (GSM) network to provide a practical and cost-effective remote fuel level watching system. The mine from subversive must be sized, processed and handled effectively and with efficiency coal is keep in bins or storage towers in plants and conjointly in outside areas. Little plants sometimes store coal in storage towers and bunkers directly provide the furnaces for sooner or later operation. Coal reserves for big plant area unit store outdoors next to the plants by stock support schemes.

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, RXD (receive), TXD (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., TXD, RXD and GND.
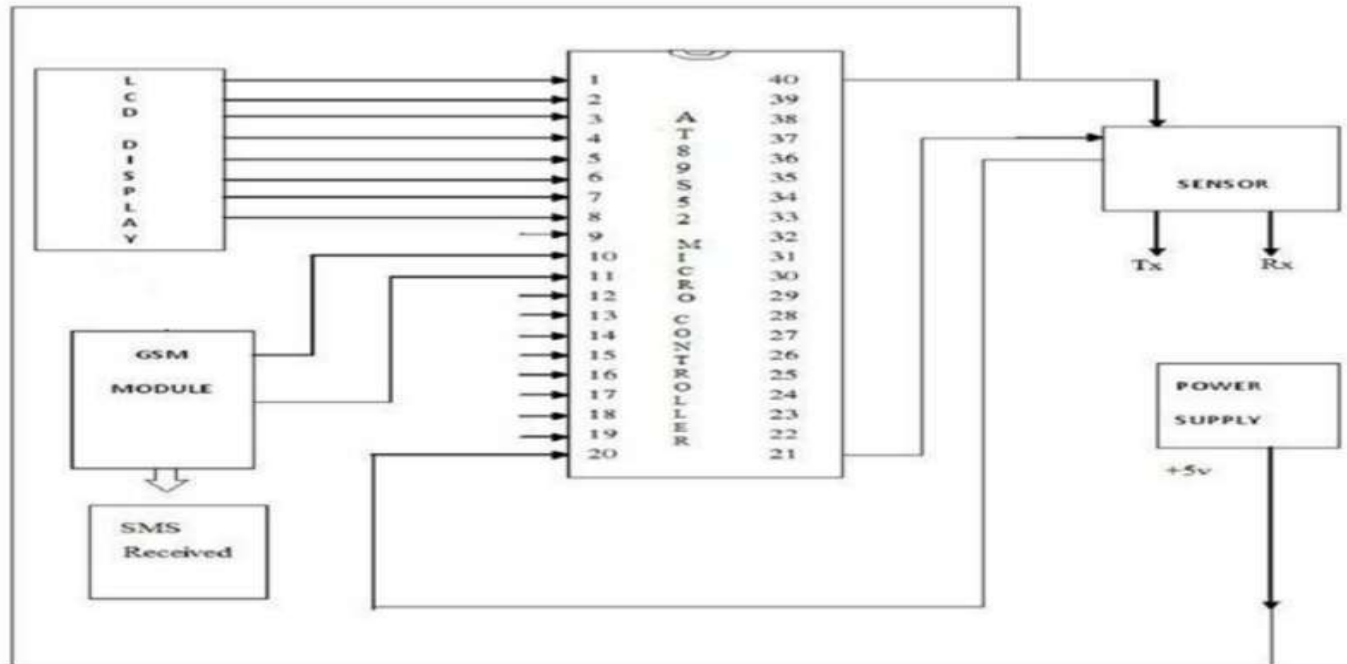

Fig. Simple Architecture of GSM Based Fuel Security System

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

The Flow-Chart and the Algorithm used for the Model is being given below:

The Algorithm for the following program is mentioned below:

Step 1 Start

Step 2 Initialize ports and stack , P1.4=ALARM, P2.0=sensor, Data lines (LCD)=P0.0 to P0.7,

Step 3 Initializing modem and modem connected

Step 4 Reading the mobile number

Step 5 System activated

Step 6 Active high (" Fuel is intact and safe") displayed on LCD

Step 7 IR sensor

Step 8 Active low= Armed condition ("Caution Fuel Theft"), Sends SMS , alarm starts

Step 9 Message is displayed on LCD and owner's mobile

Step 10 Obstruction when not present

Step 11 Disarmed condition=Active high ("Fuel is intact and Safe")

Step 12 Send sms to owner's mobile and is displayed on LCD

Step 13 End

3.RESULT

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.

Step by step procedure to operate the system

STEP 1.

After switching on the system, the GSM based fuel theft security is installed.

STEP 2.

After the system is activated the modem is initialized and connected.

STEP 3.

GSM Modem is activated and interfaced properly with the peripheral

STEP 4.

The system then reads the mobile number that is loaded in the microcontrolle

STEP 5.

After the system is activated it displays the safety of the fuel on the LCD screen The circuit is kept standby through an IR beam focused on to the Photodiode. When the beam path breaks, alarm will be triggered.

 STEP 6.

When the sensor is obstructed as shown in the images below i.e. between the LED and the phototransistor, it becomes active low. During which the message about the fuel theft is displayed on the LCD screen and an alarm message is sent to the mobile no. which is loaded in the microcontroller and the buzzer starts ringing. After the obstruction is removed from the sensor, it becomes active high. During which the message "fuel is intact and safe" will be displayed on the LCD screen and a message about its safety is sent to the mobile number that is loaded in the microcontroller.

4.CONCLUSION

A cost effective, simple, miniature and robust GSM based anti-fuel theft security system has been successfully designed and constructed. After the sensor is obstructed i.e. between the LED and the phototransistor during which the message about the fuel theft is displayed on the LCD screen and an alarm message is sent to the mobile no. which is loaded in the microcontroller. Upon reception by microcontroller it sends text message and starts up an alarm. The system exhibits a satisfactory performance. This system has many advantages such as large capability, wide areas range, low operation costs, effective, strong expandability and easy to use in vehicles or any place with fuel storage. Upgrading this setup is very easy which makes it open to future a requirement which also makes it more efficient. The total set-up is all about controlling fuel-theft. The system is about making vehicle more secure by the use of GPS, GSM technology [3].This system can be further enhanced by the use of camera and by developing a mobile based application to get the real time view of the vehicle, which would be more convenient for the vehicle owner to track the crime scene (theft).

4. REFRENCE

[1] ETSI(European telecommunication standards institute),GTS-GSM Technical Specification Version 5 Jan. 1995.

[2] ETSI(European telecommunication standards institute),GTS-GSM, "short message service cell

broadcast (SMSCB) support on the mobile radio interface",vol.5,no.1,pp 443-489,July 1996.

[3] Telecommunication Industry Association "sms" TIA/EIA-637-A,Dec 1999

[4] The term "crystal oscillator" refers to circuit not the circuit,not the resonator:gaf,ruodolff.(1999) Modern discitionary of Electronics, 7th Ed US Newnes pp.162.163.ISBN 07506986667.

[5] Laplante,Phllip A.(1999).Comprehensive dictionary of electrical engineering. US:Springer. ISBN 3540698667.

[6] G.peersman, S.Cvetkovic, P.Griffiths, and H.Spear,"the global system for mobile communication SMS",IEEE personal communication June 2000.

[7] Amos, s.w.;Roger Amos (2002).newnes dictionary of electronics, 4th Ed.. US:Newnws.p.76.ISBN 0750656425.

[8] M.Schwartz, "Mobile wireless Communications," Cambeidge University Press ,ISBN 0-521-84347-2 Dec.2004.

[9] Goodman, D.J., "Trends in cellular and cordless communications", IEEE Communications Magazine, Volume: 29 , 1991.

[10] Monitoring & Control System", IEEE International Conference on Consumer Electronics, Communications &Networks, 2004. Kalmanek C., Murray J., and Rice C., Moskal A., " A Network - Based Architecture for Seamless Mobility Services", IEEE Communications Magazine, 2006.

[11] Z. Alkar, U. Buhur, (2005). An Internet Based Wireless Home Automation System for Multifunctional Devices. IEEE Consumer Electronics, 51(4), 1169-1174.

[12] Ali A. R., & Rousan M., Mohandas M., "GSM-Based Wireless Home Appliances