JETIR.ORG ISSN: 2349-5162 | ESTD Year : 2014 | Monthly Issue

JOURNAL OF EMERGING TECHNOLOGIES AND INNOVATIVE RESEARCH (JETIR)

An International Scholarly Open Access, Peer-reviewed, Refereed Journal

FUEL THEFT DETECTION SYSTEM

VENKATESHA[1], SIVA SURYA A[2], NAVEEN KANNAK[3] ,HARIANGURAJ T[4], SATHEESHKUMAR M[5]

[1]Assistant Professor,[2, 3,4,5]Student

[1,2,3,4,5]Department of Electronics and Instrumentation Engineering,

[1,2,3,4,5]Dr. Mahalingam College of Engineering and Technology, Coimbatore,India.

Abstract:

Invention of automobile vehicle is blessing for human being. Till date, most ofthe automobile vehicle work on natural petroleum such as petrol, diesel and liquid petroleum. At present scenario, the cost of fuel worldwide has increased so a very large extent. Due to which we tend to encounter various issue related to vehicle thief such as fuel and accessories. Out of these, fuel theft has become a rampant problem due to increasing in fuel cost. The owner can be cheated by his own driver or unknown person or by the petrol bunk. Thus for solving this issue the vehicle must be ensured with proper fuel safely mechanism. Hence we present a simple mechanism for solving the problem of fuel theft. The travel and transport agencies tend to own many vehicles such as maxi cab, Lorries and trucks etc. and the maintenance and tracking of fuel contained in the vehicle becomes difficult when they go far from the station. Our project mainly focus on the concept of: Identification of fuel theft by monitoring its quantity. Henceforth, the owner can track the vehicle at the same time he can keep a check on the fuel contained of vehicles, which could help him save his money and manage many other hurdles.

INTRODUCTION

The development of automobileshavesignificant role in modern civilization over the past few decades. Most of these vehicles are cars, Lorries, trucks, bus, etc. runs bytraditional transport fuels such as petrol, diesel, and gasoline etc. The problemsassociated with these vehicles are to use the fuel effectively and ensure the safety,security and benefits of the users. Now-a-days security is one of the issues in modern society. With fleeting time crime rates is also increases. Furthermore, the fuel price over the past few years is increasing with May effect onmodern life. The vehicle may loss fuel in many ways such as leakage, cracking of fueltank and fuel theft. It may affect both safety of life and economic loss. So, the fuelloss or theft from the vehicle is an most important issue in many cities. Although there are many alarming issues, in this the work preference is given to the unanticipated issue of fuel theft was from the transport vehicles. Most of the transport users are counting a loss of a lot of currencies because of these unusualfuel loss. Thisunexpected fuel loss have great impact on the economy of a country. It is very alarming and undesirable issue for many developing countries like India, Bangladesh,and China etc. Petrol and diesel theft is a international problem. In the developingcountries the fuel theft rate is incredibly high. So, the issue of fuel theft have become a major annoyance for the users which may one of the causes to derive initial fuelprice. To detect the fuel theft problem as well as suddenly decrease the fuel level differentsensors has been invented such as level sensor, ultrasonic sensor etc. All the sensors have some advantage and disadvantagesuch as pressure sensor is suitable for large size of tank. It is not suitable for smallrange. In this work, ultrasonic sensor is used. Ultrasonic sensor is very helpful toprevent fuel rate as it is a very accurate with respect to other sensors. This paperexplains an effective and advanced system implementation for fuel level monitoringand ensure maximum security using GSM module. The proposed system has been designed to work with GSM technology which will receive the information from theArduino when the fuel tank is opened and closed. GSM is the mature technology and in present no area where GSM is not available. Mobile communication makes this technology viable and unique in such a way that many of the system or applicationdesigned can be made to work with GSM. Gsm technology is world-wide used, widecoverage area, implemented and following standard. So the main objective of this work paper is to monitor the fuel level with the help of ultrasonic sensor and by the basic program of microcontroller it will send a signal to GSM module. Thisinstallation of this is a very cost efficient and effective technology and can ensure advanced security. By applying this technology. Unexpected economical loss can be avoided.

I. LITERATURESURVEY

In one of the articles GSM modem has been used, which send message to the owner of the vehicle when there is fuel theft going on [1]. This system assures the security of vehicle fuel whenever the vehicle is at rest position and also monitor the fuel level in the fuel tank. If the fuel level decreases when the bike is at rest position the system detects that fuel theft is going on. And it will activate the alarm and send the message to the owner of the vehicle hence "Fuel Theft Detected". To send message GSM module is used. This GSMModule has a unique IMEI number which is used to track the vehicle's spot. The main disadvantage of this project is that it takes a long time to deliver the message, the position of the vehicle is in accurate most of the times and it is complicatedtouse.

In another system developed by Mr. P. Senthil Raja and Dr. B.G.Geetha [2] Vehicle Area Network (VAN) and also embedded Design have been used. In the proposed system, the owner of the vehicle receives a message when the fuelTank is opened by the operator or by a fuel traded mechanism and also the height of the fuel tank while opening and closing of the tank. The system uses wireless communication for monitoring the vehicle's spot. The process involves measuring level followed by response of the information and sends it to the server for further detection. The major drawback ob-Served in this project is that the lock opens after several trials, which is time consuming, also the proposed System is extremely expensive.

There is a scope of improvement for sensors. Another work is done by Mr. M. Saravanan, Mr. T. Krishnapriya, Mr. S.R. Lavanya, and Mr. P. Karthikeyan [3] contributedtheir efforts in making this system. There are various methods to monitor the quantity of fuel namely level Sensors, float switch, load cell, analog, and digital meters are widely used and it is a manual job. To overcome This issue, this system is proposed to know the number of liters present inside the tank with the help of the Ultrasonic sensor and GSM to indicate the level in case of full/empty and theft. The disadvantages observed here requirescontinu-Ous electric energy for the working and display purpose of signal. It also requires an amplification circuit is used for the generation of Display because the signals generated by the gauge itself are of very much low voltage almost in millivolts. It cannot be Used highly reactive or corrosive materials because they damage the gauge. It can't be used for measureofVery high pressure if the diaphragm used is made of plastic

Heda Venkata Sai Ajith1 and Mr. Pinjala Sai Kiran[4] has developed an Antitheft security system that utilizes an Embedded system was designed with GSM module to monitor and safeguard a car. In an attempt of theft, the system sends a message to the car owner and at the same time starts up an alarm by circuit connection to buzzer installed within the system. The sensors are Not effective in most of the cases also, it is too complicated to do the setup within the fuel tank

.Ms. Nandini Hiremath, Ms. Mrunali Kumbhar1, and Ms. Aakriti Singh Pathania developed the system [5]. The sys-Tem includes Microcontroller, GSM module, LCD, and a keypad. The GPS module transmits coordinates to The microcontroller converts the data which is sent to the user in text format. This text message contains longitude and Latitude of the location. This smart system gives 24x7access to fuel consumption, indicates when fuel drains, and storage tank Leaks immediately identified. The only disadvantages observed here is the size of the model. It is not ideal to fit in smaller tanks.

II. BLOCK DIAGRAM

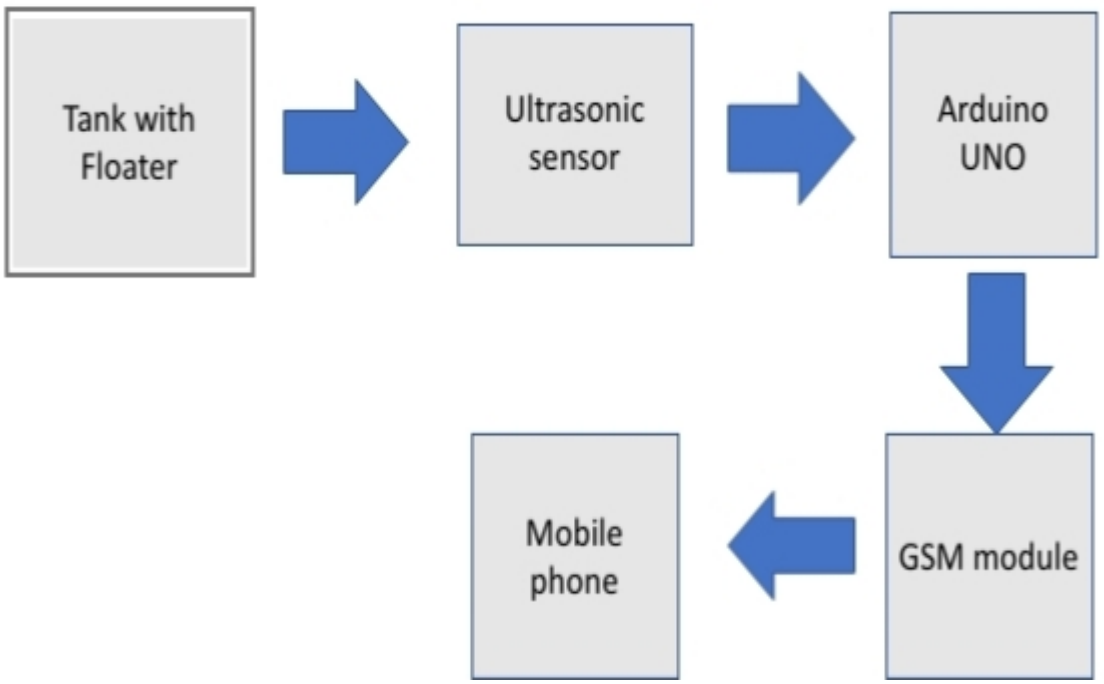

Figure 1 Block diagram

The square outline of fuel theft detection is displayed in the figure 1. It involves Ultrasonic sensor, GSM module, microcontroller Arduino Uno, tank.

3.1Ultrasonic sensor

When the trigger input given the transmitter emits an 8 bursts of an directional 40KHz ultrasonic wave And starts a timer. Ultrasonic pulses travels outward till they encounters an object, The Object causes the wave to be reflected back towards the receiver. The ultrasonic receiver Would detect the reflected wave and also stops the timer. The velocity of the ultrasonic Burst is given 340m/sec in air. Based on the transmission and receiver count by the timer, the distance can Be calculated between the object and the transmitter

3.2GSM module

This is an compact and reliable wireless module. The SIM900A is a Complete Dual-band GSM/GPRS solution in which SMT module can be Embedded in the customer applications allowing them to benefit from small Dimensions and also for cost-effective solutions. Featuring an industry-standard Interface, the SIM900A delivers GSM/GPRS 900/1800MHz performance for the Voice, SMS, Data, and Fax in a small form factor with low power Consumption. With a tiny configuration such as 24mm x 24mm x 3 mm, SIM900A Can fit in almost all the space required in your applications, especially for Slim and compact demand of the design

3.3Arduino

Arduino UNO board uses ATmega328 Micro-controller. It contains 14 digital input and output pins, reset button, an USB and power jack. Uno means one in Italian and language which means Arduino 1.0 series. The Uno series is the latest Version of USB Arduino boards. This Arduino board can be powered with the help of USB connection as well as external Power source. It selects the power source automatically.

Proposed System

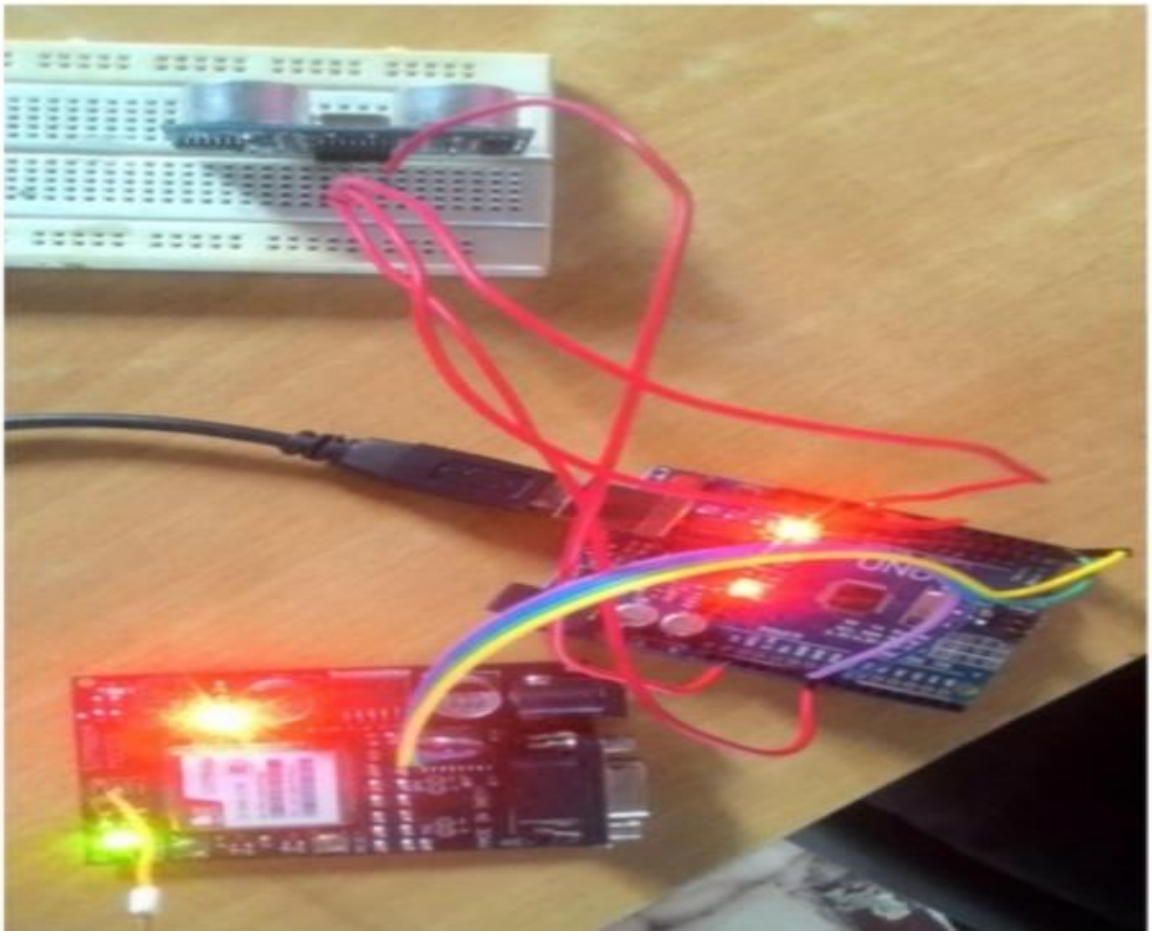

Figure 2 Hardware Setup

III. RESULTS

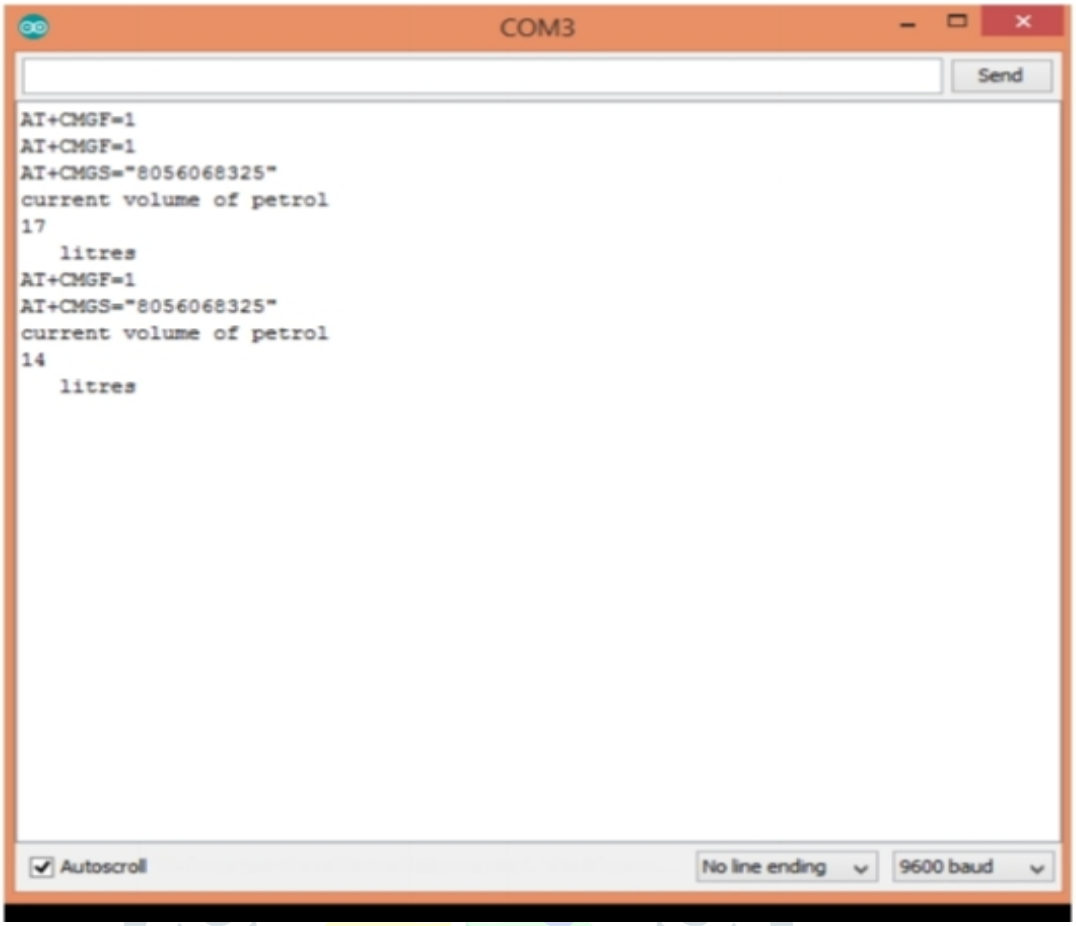

Figure 3 Project output

CONCLUSION

In this work an advanced and cost effective vehicle fuel theft detection has been Proposed. We used a cheapest ultrasonic sensor which can measure the fuel Level accurately. GSM module is also used for advanced communication. In Future we can also use GPS technology for finding location of the petrol bunk. By implementing this device in reality, while manufacturing the transport Vehicles. We can save the owner from cheated by the driver.

IV. REFERENCES

1 Huang, H., Xiao, S., Meng , X., and Xiong, Y., "A Remote Home Security System Based on Wireless Sensor Network and GSM Technology", Proceedings of Second International Conference on Networks Security, Wireless Communications and Trusted Computing, 2010. (Conference Proceedings)

2. B.G. Nagaraja, Ravi Rayappa, M. Mahesh, Chandrasekhar M. Patil, Dr.T.C. Manjunath:-"Design & Development of a GSM Based Vehicle Theft Control System" 978-0-7695-3516-6/08 ©2008 IEEE, DOI 10.1109/ICACC.2009.154, pp.148-152.

3. LPC2131/32/34/36/38, Single-chip 16/32-bit microcontrollers; 32/ 64/ 128/256/512 kB ISP/IAP flash with 10- bit ADC and DAC. Rev. 5.1- 29 July 2011. http:// www.nxp.com/ documents /data Sheet/LPC2131_32_34_36_38. Pdf.

4.Aher.,KokateR.FuelMonitoringandVehicleTrackingIJEIT.2012;3(1);ISSN:2277-3754.sss

5. Sharma A, Sharma P, Bhardwaj D, Mishra D, Soni A. Load Cell Based Fuel Theft Detection System Journal Of Electronics and Communication Systems MAT Journals.2016; 3(1):1-4.

6. Katkar G, Lanke S, Kumar A, Khawate S. Fuel Checker and Theft Detection IJARIIE.2017; 9(3):1813-1815.

7. Huang, H., Xiao, S., Meng, X., and Xiong, Y., "A Remote Home Security System Based on Wireless Sensor Network and GSM Technology", Proceedings of Second International Conference on Networks Security, Wireless Communications and Trusted Computing, 2010. (Conference Proceedings)

8. B.G. Nagaraja, Ravi Rayappa, M. Mahesh, Chandrasekhar M. Patil, Dr.T.C. Manjunath:-"Design & Development of a GSM Based Vehicle Theft Control System" 978-0-7695-3516-6/08 ©2008 IEEE, DOI 10.1109/ICACC.2009.154,pp.148-15