ISSN: 2278 – 909X
International Journal of Advanced Research in Electronics and Communication Engineering (IJARECE)
Volume 8, Issue 4, April 2019

Automatic Vehicle Fuel Filling Measurement System using flow sensor, GSM and Arduino UNO

Amel Lenore, Jaseera Nusrin KP, Mashitha P, Shafeeque Rahman O, * Denna C Baiju, *Soumya

Abstract— Nowadays there are many issues occurring in filling of fuels in vehicles. Mainly in the quantity of fuel filling from the pump. The workers of pump can set the quantity of fuel for some particular price. Also the owners of the heavy vehicles get cheated by their drivers since they give a fixed amount of money for filling the fuel but drivers refuse to fill for the full amount. The main aim of this project is to design a system to inform the owners of the vehicles about the quantity of the fuel filled and they can calculate the price of the fuel filled. This can be informed by sending the message to the owner's mobile phone.

Keywords
GSM- Global System for Mobile Communication
LCD- Liquid Crystal Display

I. INTRODUCTION

Fuel filling pump frauds are very common in nowadays. Many of the petrol pumps today tempers pumps such that it displays the amount as entered, but in reality, the inlet of fuel filled in the consumer's tank is much lesser than the displayed value .Also the drivers of the heavy vehicles often tend to cheat their owners by not filling the fuel for the actual amount. They fill the tank for an amount which is less than the amount that the owners prescribe, so that they can save the money. The pumps and drivers are cheating for the profit that they earn .This results in great profits for the petrol pumps and drivers but at the same time the customers are being cheated. Most of the vehicles in India consist of analog meters which will not give the exact amount of fuel currently in the vehicle and also it is not possible to verify the quantity of fuel filled at the petrol pump. Also in this modern and progressive world, products are being digitized for its benefits and user friendliness.

II. SYSTEM LAYOUT

This system mainly consists of flow sensor, GSM module, microcontroller, Push button, LCD display. The flow sensor measures the amount of fuel entering to the vehicle fuel tank. The fuel flows through the rotor and the rotor rolls. Its speed changes with different rate of flow. The hall –effect sensor outputs the corresponding pulse signal. The microcontroller is used to program and convert the pulse signals into corresponding quantity of fuel filled in the tank. GSM module is used to inform the owners about the quantity of the fuel. The LCD display is used to display the corresponding amount of fuel filled. When the fuel tank is closed the pressure goes to the push button and it get pressed so that the signal is received in the microcontroller. When the signal is received at the microcontroller, GSM module send message to the owner mobile phone about the quantity of fuel filled. In this project we develop a system that senses exact inlet value of the fuel in the tank of vehicle and inform the owner of the vehicle by sending message. This system can prevent us from getting cheated by the petrol pumps and the theft drivers. Also the owner can exactly know the amount of fuel filled and for what amount the same has filled.

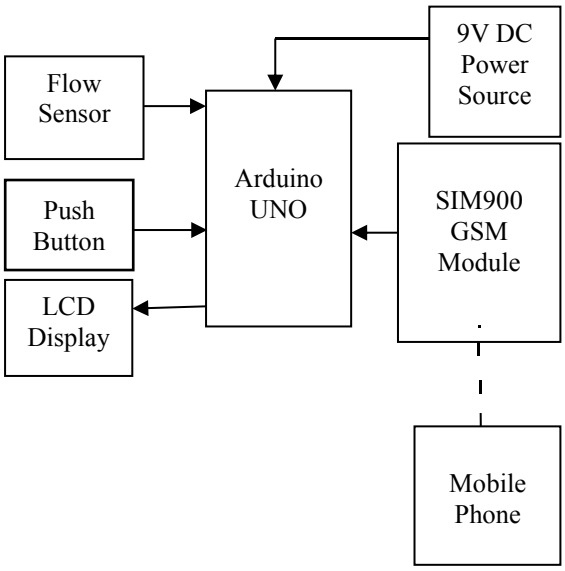

Fig i. Block Diagram of the system

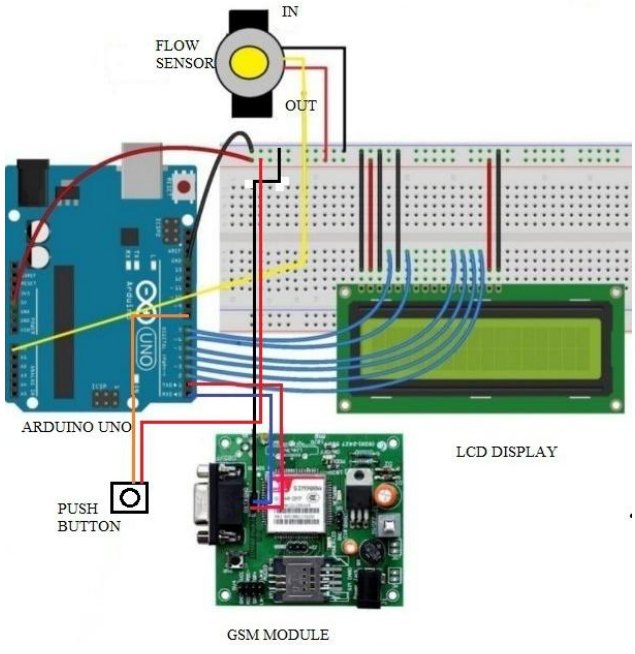

Fig ii. System diagram

III. HARDWARE

A. Hardware design

i. Flow Sensor

Flow sensor consists of a plastic valve body, a rotor, and a hall-effect sensor. When fuel flows through the rotor, rotor rolls. Its speed changes with different rate of flow. The hall-effect sensor outputs the corresponding pulse signal.

Fig iii. Flow Sensor

ii. SIM900 GSM module

The SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. Featuring an industry standard interface, the SIM900 delivers GSM/GPRS850/900/1800/1900MHZ performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption.

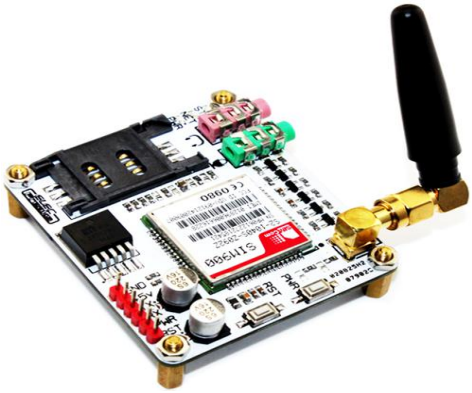

Fig iv. SIM900

iii. 16 x 2 LCD display

LCD (Liquid Crystal Display) screen is an electronic display module. A 16 x 2 LCD display is basic module and is very commonly used in various circuits and devices. LCDs are economical, easily programmable have no limitations of displaying special and even custom characters, animations and so on.

A 16 x 2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in 5x7 pixel matrix. This LCD has two registers, namely, Command and Data. The command register stores the command instructions given to the LCD. The data register stores the data to be displayed on the LCD.

Fig v. 16 x 2 LCD display

iv. Arduino UNO

In the design of prototypes we use Arduino UNO. Arduino UNO is one of popular Arduino that uses ATmega328. Arduino UNO has 14 input / output digital pin (6 of which can be used as PWM outputs), 6 analog inputs, an oscillator crystal 16 MHz, a USB connection, a power jack, an ICSP header, and a reset button.

Fig vi. Arduino UNO

V. CONCLUSION

Project named “Automatic Vehicle Fuel Filling Measurement System By using flow sensor, GSM and Arduino UNO and SMS alert”. In this project we develop a system that measure the volume of fuel entering to the fuel tank of vehicle with the help of the flow sensor and this sensed volume is send to the mobile handset of the owner by using GSM module. Hence the owner can exactly know the amount of fuel filled and for what amount the same has filled. This can prevent the theft of fuel to a great extent. Here we are placing the sensor on our fuel tank of the vehicle so that it can measure the actual volume of fuel. It consists of a digital display for the exact volume of fuel inlet in the fuel tank. The above discussed fact is considered in the project and it is found that a proper solution for showing the approximate volume of fuel entering the tank in the digital form. From the conducted prototype design, it can be seen that the prototype worked as expected.

REFERENCES

i. Tigor Hamonangan Nasution, Muhammad Anggia Muchtar, Ikhsan Siregar, Ulfi Andayani, Esra Christian, Emerson Pascawira Sinulingga "Electrical Appliances Control Prototype By Using GSM Module And Arduino"
ii. Uzval Sai Gopinadha Varma Dontiboyina and Prachi Dutta "Faucet Add-On Water Supply Management System Using Smart Sensors"
iii. Tanvir Rahman, Tanzia Ahmed, Ibteaz Hasan and Md. Ashraful Alam "Automated House Hold Water Monitoring And Billing System"
iv. Neaz Md. Morshed, G.M. Muid-Ur-Rahman, Md. Rezaul Karim and Hasan U. Zaman Department of ECE, North South University, Dhaka, Bangladesh "Microcontroller Based Home Automation System Using Bluetooth, GSM, Wifi And DTMF"