

EFFICIENT MILEAGE TRACKING FOR VEHICULAR ENVIRONMENT

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Abstract - Fuel Management Systems (FMS) are used to maintain, control and monitor the fuel consumption in any type of organization that uses transport, including rail, road, air and water as means of business. Due to manual monitoring, currently the organizations are facing a serious problem of managing the fuel transportation. This manual monitoring provides an inefficient way of calculating and analyzing the fuel ingestion and can lead to financial losses for the person. In the typical scenario used by most organizations there is no logging or auditing mechanism to check that the number of liters of fuel in the tank. The driver takes the vehicle to the fuel depot, fills the tank and gets the receipt from the pump manager, mentioning the number of liters of fuel inserted into the vehicle tank, date and the amount. Fuel Management System consists of basic electronic components which are then mounted on tankers for the purpose of measurement and monitoring of its liter. It measures the number of fuel liters on the vehicle and displays the distance for the remaining fuel.

Key Words: Arduino, Ultrasonic sensor, LCD, Fuel tank

1. INTRODUCTION

In India, the mileage issue has risen to be a major issue prompting clients stalling out in obscure zone since they neglect to check the fuel level. The fuel is a substance which burned to provide nuclear energy, power, or heat. The amount of fuel used to travel a particular distance in the vehicle which is the fuel consumption to be displayed. Fuel mileage refers to the relation of the distance travelled by the vehicle for the remaining fuel in the tank. Reducing mileage has several potential benefits, which can be achieved without a detrimental effect on your business. In the busy schedule of the current century, the middle aged people are running on time to reach the destination in two-wheelers. With that tenseness, we are getting out without knowing the thought of fuel used in the two-wheelers. This paper explains the clear idea about the exact range of the fuel in the bike. It also demonstrates the exact mileage of the fuel within the bike. Thus, it helps to reduce the effect of pressure in the current situation. Although there is no measurement of the exact range, it will prevent us to know the distance pass by the bike. So, it makes more efficient to display the fuel range and the distance of the bike. This demonstration reveals the concept of displaying the fuel range and the distance which is being to travel in the two-wheelers.

2. LITERATURE REVIEW

“Automatic monitoring of fuel in vehicles using ATMEGAA328 microcontroller” the fuel can monitored while the fuel is being inserted. The system can be used to prevent thefts.

“Digital fuel indicator with petrol level detection” the fuel can be measured and displayed digitally.

“Design of smart fuel tank for automobiles” the mileage of the vehicle engine gives and the engine’s temperature is controlled.

“Fuel level calibration using wireless sensor network” the exact count of the petrol can be sensed while filling in the petrol tank.

“Fuel level indicator in cargo tank” the exact availability of the fuel in the tank can be found and indicated in percentage using GSM technology.

3. EXISTING SYSTEM

Usually, the fuel range can be displayed through the indicator by displaying the range of about E and F. Here, E denotes the empty range of the fuel and F denotes the full range of the fuel tank.



It has been developed step by step by displaying the fuel in litres. Further, it has been digitally displayed about the number of litres in the fuel tank. The fuel tank management system has displayed the exact range of the fuel litres in the fuel tank.

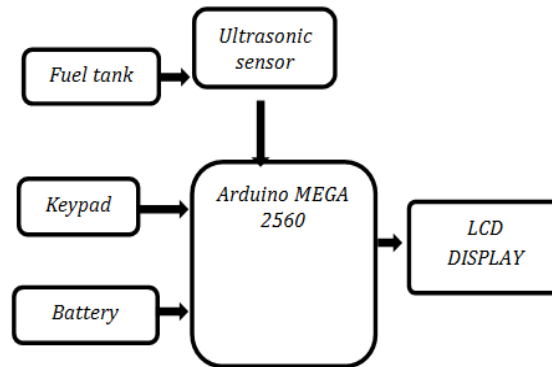


The existing system had only focused on highway fuel tankers for the transportation of fuel on the subject of management. The system offers the most comprehensive solution on the market for knowing exactly how much fuel is inserted and how much fuel is there and how much the fuel used by the vehicle and it is a major drawback for vehicle user.

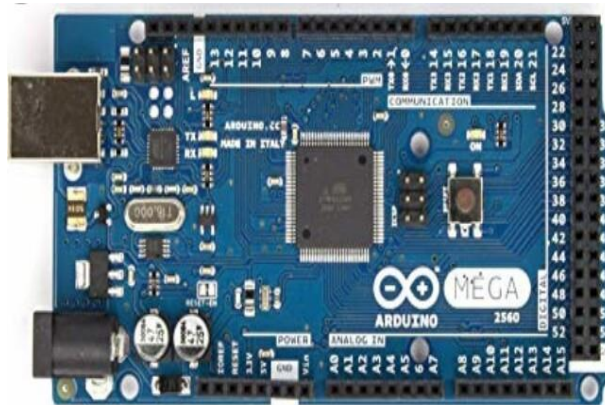
4. PROPOSED SYSTEM

Automatic Fuel Management System (AFMS) consists of basic electronic components which are then mounted on tankers for the purpose of measurement and monitoring of its volume. It measures the number of litres when inserted into the tank as well as when fuel will run and then it displays the distance to be travelled by the vehicle driver. The proposed system involves hardware and software part. Hardware part is used for sensing number of litres. Whereas, software part is used for the simulation of the distance. The proposed idea is to indicate the exact fuel level in the tank digitally. The mileage of that vehicle is known and entered through the LCD. The distance to be travelled can be calculated manually.

5. METHODOLOGY



A. ARDUINO MEGA 2560



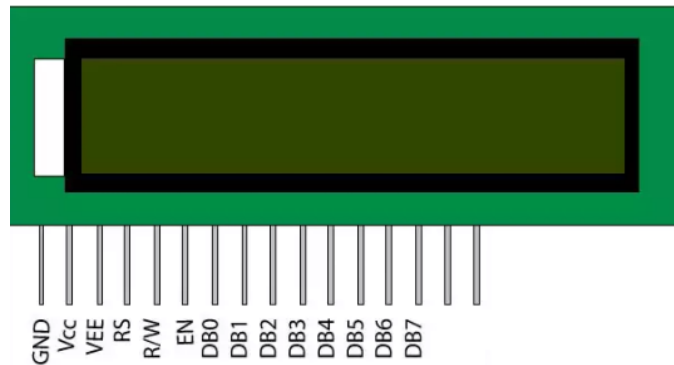
Arduino is an open-source electronics platform depends on easy-to-use hardware and software. Arduino boards are able to read inputs-light on a sensor, Twitter message or a finger on a button and turn it into an output-activating a motor, turning on an LED, publishing something online. The Arduino mega 2560 board is connected with the Ultrasonic sensor and LCD display.

B. ULTRASONIC SENSOR



Determine distance to an object. One membrane produces sound and the other catches and reflects echo. The sensor detects the fuel level by the reflection of the echo. Non- contact distance measurements within a 10cm range. It can be varied according to the height of the tank.

C. LCD DISPLAY



LCD (Liquid Crystal Display) screen is a display module of an electronic device and has a wide range of applications. A 16 x 2 LCD display can be used to display 16 characters per line and there are 2 such lines. It is used to enter the mileage and to display the actual distance to be traveled by the vehicle driver.

D. KEYPAD



Keypad is used to enter the mileage of the vehicle. Enter and reset buttons are processed through the keypad. It is then connected with the Arduino mega 2560 board. The mileage can be reset for different values of different vehicles.

6. SOFTWARE USED

Arduino Integrated Development (IDE) connects the Arduino and Genuino hardware to upload programs and communicate with them. Arduino software programs are called sketches. The Arduino software displays text output and error messages and other information. The sketch can be saved with the .ino extension on save. The code can be verified for errors and it can be compiled and uploaded to the configure board. Then the final programming code can be saved with the software. The processor can be compiled through the ATmega2560, which gives the clear output. The tools can be checked before uploading by selecting the ports with COM. While uploading, the program has been loaded on to the microcontroller. The languages can be changed manually in the Arduino software (IDE). Thus, the programming code can be compiled through the microcontroller board.

7. IMPLEMENTATION

Power supply is used to connect with the Arduino board. Arduino MEGA2560 is a microcontroller board based on the ATmega328. Open source platform enabling users to create interactive electronic objects. Ultrasonic sensors evaluate the echo which is receive back by the sensor, measuring the time interval between sending the signal and receiving the echo, to determine the distance of an object. LCD screen is a display module of an electronic device and finds a wide range of applications. A16x2 display is very basic module and these are performed over seven segments. Keypad is used to enter the mileage of the vehicle so that the distance of that vehicle can be predicted for the remaining fuel. While the vehicle is running, the fuel is consumed and

getting reduced. The distance prediction is being changed with the help of the Arduino board used in it. The distance can be watched lively for the remaining fuel. The mileage can be varied for different vehicle mileages. Thus, the distance is predicted using the ultrasonic sensor.

8. CALCULATION

The distance of the vehicle can be calculated by,

$$l*b*h = (\text{no. of litres} * 1000 + \text{offset})$$

where,

l is length of the tank

b is breadth of the tank

h is height of the tank

h=constant

Ex:

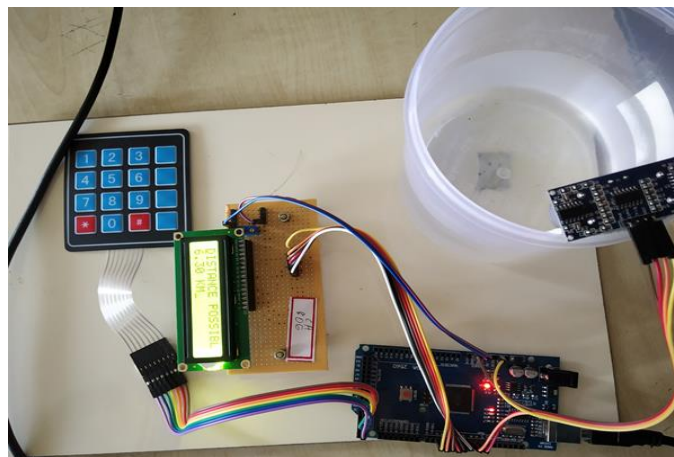
$$h = 10 \text{ cm}, l = 10 \text{ cm}$$

$$10 * b * 10 = 1155$$

$$b = 1155 / 100$$

$$b = 10.5$$

9. OUTPUT



10. CONCLUSION

This method will yield accurate results while driving on plane surfaces and roads, with the usage of ultrasonic sensor and flow sensor to digitalize and indicate the fuel level in two-wheelers. In this system, it gives the accurate value of remaining fuel as well as the vehicle running capacity in km (mileage). Hence, the system can be installed in vehicles to measure the number of fuels litres in the tank and displays the accurate distance to be travelled. This is the system which is more efficient and reliable and very cheap compared to the existing system.

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