

PETROL FLOW MEASURING DEVICE

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Abstract

Petrol pump frauds were very common in now days. Many of the petrol pumps today than temper the pumps such that it displays the amount as entered, but in actual, the quantity of fuel filled in the consumers tank is much lesser than the displayed value. The pumps are cheating for the profit of the petrol pump owner. This results in great profits for the petrol pumps, but at the same time the petrol consumers are being cheated. Most of the two wheelers vehicle in India has analog meters for the measurement of fuel level which is not much exact, so it is not possible to measure exact amount of fuel inlet. In this modern a progressive world, products are being digitized owing to its benefits, user friendliness. So, we are developing a project name “ Petrol flow indicator ”. It consists of creating a digital display for the exact volume of the fuel contained in the fuel tank. the above developed fact is considered in the project and it is found out an effective solution for indicating the exact inlet of the fuel in the tank digitally. A sensor and a microcontroller are used to find out the fuel inlet which is less costly and also exact. This paper is concentrating on the study of various fuel measuring sensors suitable for our developed project. Some problems with respect to the existing fuel measurement techniques are recognized and hence a better sensing technology has been developed.

1. INTRODUCTION

Accurate flow measurement is an essential step in both the terms of qualitative and economic points of view. Some of the meters like velocity meters use a sensor which calculates the flow rate based on the speed of water, ultrasonic sensors which works on two different principles that is transit time measurement principle and

other is based on Doppler Effect but these are having high cost of maintenance. Nowadays everything is digital all over the world. Digital fuel meter is also implemented in two-wheeler, but they might not show exact fuel level which is in the tank that is they show in terms of bars and not in numbers or digits like litter or milliliter. That's why we do not get proper

idea about fuel present in tank. We get only approximate level of fuel. So, this problem is taken into consideration for our project for developing the petrol flow indicator systems for two or four wheelers. This project mainly concentrates about the indication of fuel level in vehicles. Various other features like the distance can be travelled to the corresponding fuel, is added with this arrangement which will explain the clear performance of the vehicle to the corresponding fuel, the pumps are tampered for the benefit of the petrol bunk owner. This becomes loss for the customers. There are many sensors based on the market available techniques for measurement of level and there is a narrow idea of the quantity of fluid, but it can be an accurate approximation of the quantity of fluid.

2. RELATED WORK

Until now the accuracy of the fuel level measurement has not been of great importance. The purpose measuring the fuel level has been to present the information on the dashboard with a fuel level meter. Instead of accuracy the two most important things have been to avoid rapid changes in the fuel level displayed and the meter must indicate that the tank is empty when the fuel level is below a predefined level. This system is not capable to provide the exact value of fuel

in the fuel tank. Also such system cannot protect us from getting cheated at petrol pumps and these costs more for less amount of fuel so filled. So it becomes necessary to develop such a system which gives exact (numeric) value of fuel in fuel tank. Mainly there are four fuel measuring techniques. Until now the accuracy of the fuel level measurement has not been of great importance. The purpose measuring the fuel level has been to present the information on the dashboard with a fuel level meter. Instead of accuracy the two most important things have been to avoid rapid changes in the fuel level displayed and the meter must indicate that the tank is empty when the fuel level is below a predefined level. This system is not capable to provide the exact value of fuel in the fuel tank. Also such system cannot protect us from getting cheated at petrol pumps and these costs more for less amount of fuel so filled. So it becomes necessary to develop such a system which gives exact (numeric) value of fuel in fuel tank. Mainly there are four fuel measuring techniques.

3. IMPLEMENTATION

An Arduino based petrol flow indicator is a device which measures the amount of petrol flow. Since the fuel prices are very high these days and to prevent manipulation of the amount of petrol. A

microcontroller is used to implement the control circuit which in turn positions a flow sensor and lcd display which tells us the fuel flow in liters.

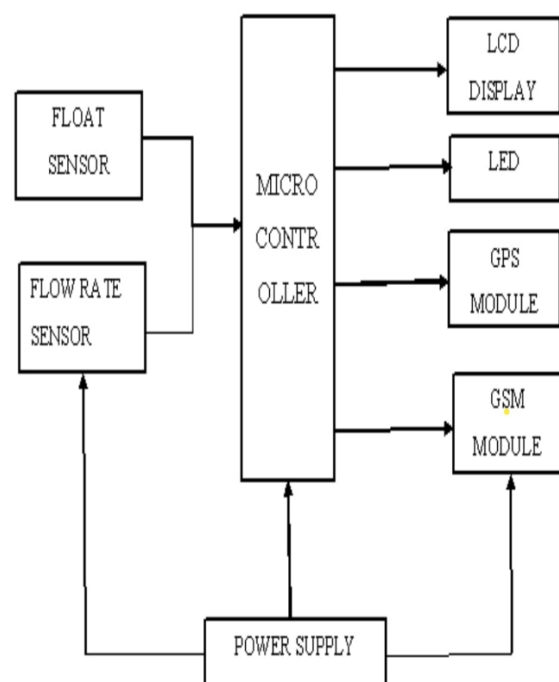
The project seeks to follow the following steps:

- To design a system to illustrate the petrol flow.
- Prove that the following in reality expands the proficiency impressively.
- To gain the trust of the customers.

Methodology:

The flow sensor is connected on the inlet of the tank. The fuel from the nozzle will directly fall on to the flow sensor. High precision flow sensor is used to measure the inlet flow of the fuel. The digital output varies according to the flow rate and it is connected to the microcontroller. The flow rate sensor is calibrated with different flow rate and embedded program is loaded in to the controller. The controller will produce the message after the flow rate is stopped for 5 seconds. In case, flow will continue within 5 seconds will be calculated with previous value and end of the fuel pouring will send a message to the registered mobile through GSM and LCD display. Users can easily verify the amount of fuel is poured on the tank. In case of any deviation, complaint

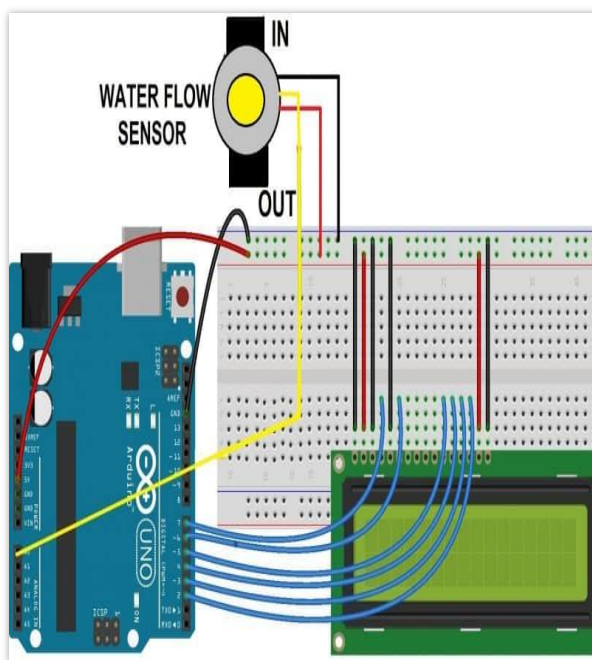
can be given to the owner of the fuel stations for remedial measures. Another part of the system is GPS module. It will sense the latitude and longitude of the current vehicle positions and measures the distance between current locations to nearby fuel stations. The distance of nearby fuel station is displayed on the LCD screen. The location of nearby station is calculated by linking the Google map with the controller. The designed system can be used for both petrol and diesel vehicle with slight modifications in controller programming according to the flow rate sensor used in the system.



4. EXPERIMENTAL RESULTS

Before fuel poured into the tank it shows 0ml in LCD display labelled as "TOTAL:" indicating that no fuel is filled in the tank.

The screen shot of the various results taken are delineated. The fuel filled in the tank is measured through flow sensor and the value is displayed on the LCD present on the dash board. A bottle containing 500 ml petrol is poured on to the tank and is measured as 498ml by the flow rate sensor is shown in figure 4(b). The system was tested with multiple times with different value of fuel level and it gives 99% accuracy. The turbine-based flow sensor is used in project due to the cost effective. If magnetic sensor or Hall Effect sensor



5. CONCLUSION

The proposed framework is to be executed in every one of the bike and four-wheeler vehicles to confirm the measure of fuel poured on to the vehicle. This model will be implemented easily with all existing

vehicles with very nominal expenses. This system will help the owner of the vehicle to know the exact amount of fuel poured and nearby fuel stations in case of low value of fuel in the tank. This system provides the alert signal to the drivers continuously until the fuel is poured. Successful implementation of this project in to the vehicle will give an alert to fuel fraudulent to pour correct amount of fuel.

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