

# Design and Implementation of Precise Fuel Meter with Petrol Pump Navigation

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## ABSTRACT

In today's world reality has moved toward becoming digitized, on the off chance that we make fuel meter in the vehicle as digital it will help know the accurate measure of fuel present in the fuel tank. In our task, we have made a digital fuel meter. Here, we are showing the measure of fuel present in the tank digitally. Fuel robbery is additionally an issue in everywhere throughout the world. In our undertaking at whatever point there is fuel burglary happens, because of the commotion of thief alert individuals know about fuel robbery and furthermore amid fuel robbery an instant message is conveyed on portable to the proprietor of the bicycle. This is the constant happening process. The past vehicle framework doesn't have such usefulness that there is no presentation gear level whatever might be the condition through the bicycle is running or not. In any case, in our framework, we can defeat the above issue by utilizing the digital meter which demonstrates the rigging level in the enduring state or running condition of the vehicle. We also provide the facility to search and navigate the nearest petrol pump. The Android app in our system gives the precise reading about the petrol added, available petrol, the average given by the vehicle and the availability of the petrol in the petrol pump.

**Keywords :** Fuel Tank, Mileage, Arduino, Digital Meter, Fuel Meter

## I. INTRODUCTION

Digital fuel meter is additionally executed in a bike, yet they don't demonstrate the definite fuel level which is available in the tank, for example, they demonstrate the measure of fuel as far as bars and not in numbers or digits like a liter or milliliter. That is the reason we don't get legitimate thought regarding fuel present in our tank. We get just surmised dimension of fuel. So this issue is contemplated for our venture work of building up the Digital (numeric) fuel pointer framework for bikes which indicates the careful measure of fuel as far as a liter or milliliter. This undertaking fundamentally thinks about the sign of fuel level in bike tanks. Different highlights like

the separation can be made a trip to the comparing fuel, is included with this course of action which will clarify the reasonable execution of the vehicle to the relating fuel. In the ongoing occasions, we are continually finding out about petroleum burglary. The vast majority of the petroleum bunks today have misrepresentation the general population with the end goal that it shows the sum as entered yet the amount of fuel filled in the client's tank is a lot lesser than the showed esteem. However, the siphons are altered to serve the oil bunks proprietor. These outcomes in immense benefits for the petroleum bunks and yet the clients are deceived. Every one of the vehicles in India comprises of analogy meters subsequently it is unimaginable to exactly know the

measure of fuel right now in the vehicle and furthermore it is beyond the realm of imagination to expect to cross check the amount of fuel filled in the petroleum bunk. In this undertaking, we center around making a digital showcase of the careful measure of fuel contained in the tank of the vehicle and furthermore help in cross-checking the amount of fuel filled at the petroleum bunk.

The Existing framework comprises of analog meters. In everywhere throughout the world, all the vehicle are having analogy fuel meter. This meter demonstrates three conditions of fuel level which are unfilled, Half and Full. So we can't pass judgment on the real fuel present in the fuel tank. In Fig1 we can see analogy meter, which demonstrates the fuel level by utilizing the needle. However, because of this, we don't get legitimate thought regarding fuel level present in the fuel tank. Because of ill-advised information of fuel present in the tank, we can experience stuck in an unfortunate situation because of low fuel. As considering past analogy framework we are going to actualize propelled framework. In our framework, we are doing digital fuel meter and robbery discovery. In digital fuel meter, we are demonstrating the measure of fuel in the tank in liters. This incentive in liters will be in numerical digits.

The fundamental issue emerges in the analog meter is fuel burglary. There is a serious issue of fuel robbery everywhere throughout the world. Burglary is negligence which incorporates expulsion of the fuel pipe without proprietor and abusing the fuel from the bicycle. The proprietor of the bicycle ignorant of fuel burglary and he will come to think about it just when he needs to ride his bicycle on whenever. This is because of nonattendance of any robber caution or bell framework. The general population didn't know about fuel robbery. To defeat this issue we have put this thought of digital fuel meter and fuel robbery. Utilizing PIC microcontroller, in our undertaking at

whatever point there is fuel burglary, because of the clamor of robber caution individuals know about the fuel robbery and furthermore amid fuel robbery an instant message is conveyed on portable to the proprietor of the bicycle. This is an ongoing happening process. As of late the lock framework for the pipe guaranteed the least measure of fuel burglary however it kept going just for the little span of time. The inconveniences of this lock framework are cheat can break the framework by utilizing copy key and expel fuel from the bicycle. The majority of the petroleum bunks today have cheated the general population with the end goal that it shows the sum as entered however the amount of fuel filled in the client's tank is a lot lesser than the showed esteem. Every one of the vehicles in India comprises of analogy meters consequently it is absurd to correctly know the measure of fuel as of now in the vehicle. Likewise, it is beyond the realm of imagination to expect to cross check the amount of fuel filled in the petroleum bunk.

Thus, in this paper we put an effort to overcome the running out of the fuel in the vehicles fuel tanks, Prevention from fuel theft and accurate meter readings. This system is implemented to detect the fuel level in the vehicle tank as the input and the percentage of the tank from its full capacity will be displayed on the LCD screen. This eventually should ease the user to estimate the fuel that they need to have for their journey. At the same time this type of product will save the fuel from being wasted and in another way consume the cost of the user itself. As for now it may seem useless but this product is somehow will benefits the user in the future as the value of fuel is unstable and that will affect the amount that we used every day as it will not be the same as before.

## II. LITERATURE REVIEW

Authors in [1] propose that, with the expansion of vehicle use over the world, fuel fundamental has turned into a colossal issue. Structure and usage of burden cell-based fuel estimation estimate the precise dimension of fuel including while fuel filling process. There is a substantial assortment of strategies for estimating fuel level, running from those utilizing mechanical buoys and capacitive and optical sensors to ultrasound techniques. These days all fuel bunks having kinds of digital showcases unit so as to show the estimation of fuel adding to the vehicle. In any case, the weakness of utilizing load cell is that it can't be utilized for estimation of exceedingly responsive material, for example, petroleum. So we chose to utilize an ultrasonic strategy for petroleum level estimation as it is a non – contact type estimation technique.

Authors in [2] propose that in everywhere throughout the world all the vehicle are having an analog fuel meter. This meter shows three conditions of fuel level which are unfilled, half and Full. So we can't pass judgment on the real fuel present in the fuel tank. In Fig1 we can see the analog meter, which demonstrates the fuel level by utilizing the needle. Be that as it may, because of this we don't get appropriate thought regarding fuel level present in the fuel tank. Because of inappropriate learning of fuel present in the tank, we can experience stuck in an unfortunate situation because of low fuel. As considering past analog framework we are going to actualize propelled framework. In our framework, we are doing digital fuel meter and robbery location. In digital fuel meter, we are showing the measure of fuel in the tank in litres. This incentive in litres will be in numerical digits (Ex: 1 lit, 1.5 lit, 2 lit).

### III. PROPOSED WORK

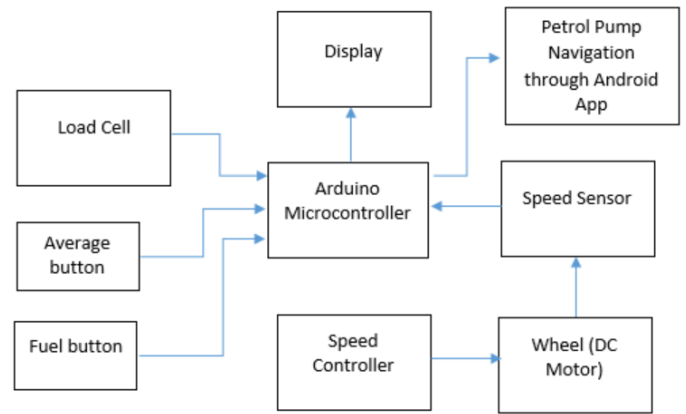


Figure 1. Block Diagram for Proposed System

To make a controller work, a power wellspring of 9V is expected to control up the Nano Arduino. In this way, a 9VDC power supply is developed utilizing the current from the power connector. The power connector is picked to supplant the transformer work. This is a direct result of wellbeing reason and materials uses. At the point when a connector is utilized as a power source to create 5V control supply, the likelihood of the circuit to harm or detonated is diminishes as power connector is more dependable than the transformer that is known as its entanglement to stable the execution. Adjacent to that the consumptions that should be determined when a transformer detonated is a lot higher while a connector only occasionally experienced such an issue. Figure 2 is the power source circuit that has been tried and worked legitimately.

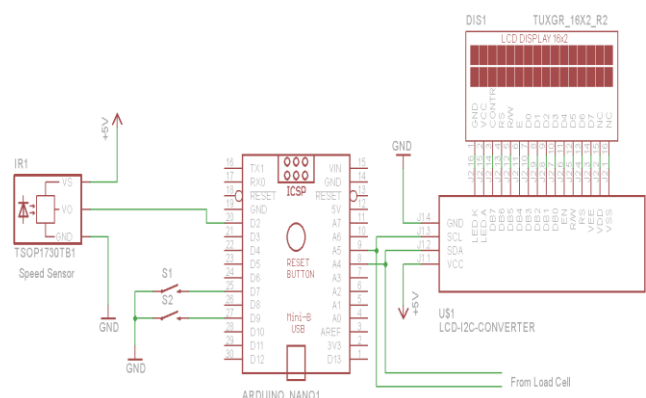


Figure 2. Circuit for Fuel Meter

The main components used for the implementation of the system are as follow:

#### A. LM393 Motor Speed Measuring Sensor

Widely used in motor speed detection, pulse count, the position limit, etc. The DO output interface can be directly connected to a micro-controller IO port, if there is a block detection sensor, such as the speed of the motor encoder can detect. DO modules can be connected to the relay, limit switch, and other functions, it can also with the active buzzer module, compose alarm.



Figure 3. LM393 Speed Sensor

- Main technical characteristics:
- Dimensions: 32 x 14 x 7mm.
- The sensor reading slot has a width of 5mm.
- Two outputs, one Digital and one Analog.
- LED power indicator.
- LED indicator of the output pulses of pin D0.

#### Features

- Using imported trough type optical coupling sensor, groove width 5 mm.
- The output state light, lamp output level, the output low level light.
- Covered: output high level; Without sunscreen: the output low level.
- The comparator output, signal clean, good waveform, driving ability is strong, for more than 15 ma.

- The working voltage of 3.3 V to 5 V
- Output form: digital switch output (0 and 1)
- A fixed bolt hole, convenient installation
- Small board PCB size: 3.2 cm x 1.4 cm
- Use the LM393 wide voltage comparator Module

#### B. HX711 Weighing Sensor (Load Cell)

Experimental electronic scales, postal electronic scales and kitchen scales, etc. generally adopt dual-hole strain weighing sensor with cantilever parallel beam, which features with high precision, easy processing, simple and compact structure, strong anti-unbalancing-load capacity and high natural frequency, whose typical structure is shown in Figure 4.

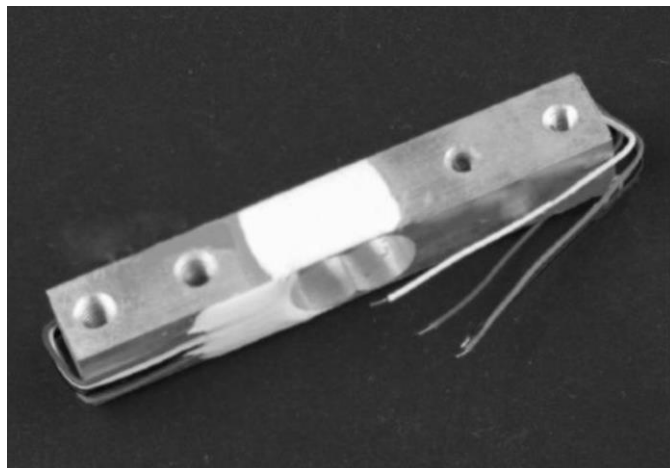


Figure 4. Load Cell

Stressing operation principle of strain sensor is shown in Figure 5.

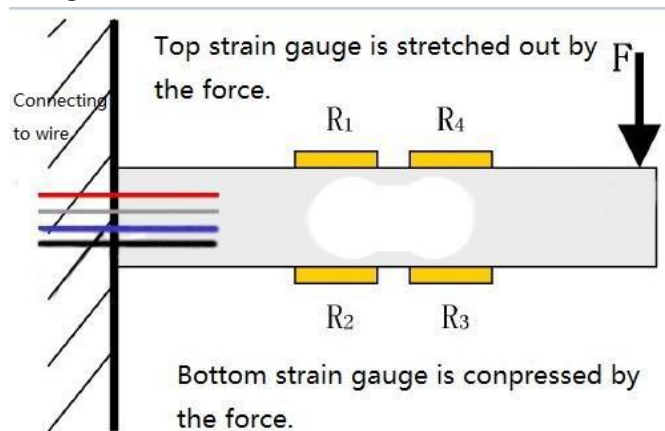


Figure 5. Stressing Operation Principle of Strain Sensor

Attach the strain gauge to the stressed pressure-sensitive element, when the elastic element is deformed by the force, the corresponding strain generated by the strain gauge will be transformed into resistance changes. Connect the strain gauges as a bridge, the resistance changes caused by force is converted to voltage changes of measurement circuit, and the weight of the measured object can be obtained by converting the output voltage value.

**Relay:** A relay is an electrically operated switch. Relays are used where it is necessary to control a circuit by a separate low-power signal, or where several circuits must be controlled by one signal.

#### IV. SOFTWARE DESIGN

The android app consist of numerous operations. It has the facility to check the available petrol. Here it shows the quantity of petrol added and net available petrol. It also has the facility to show the speed of the vehicle and amount of petrol used. Figure 6. Show the design of the activity used in the app.



Figure 6. Activity for Petrol and Speed of the Vehicle

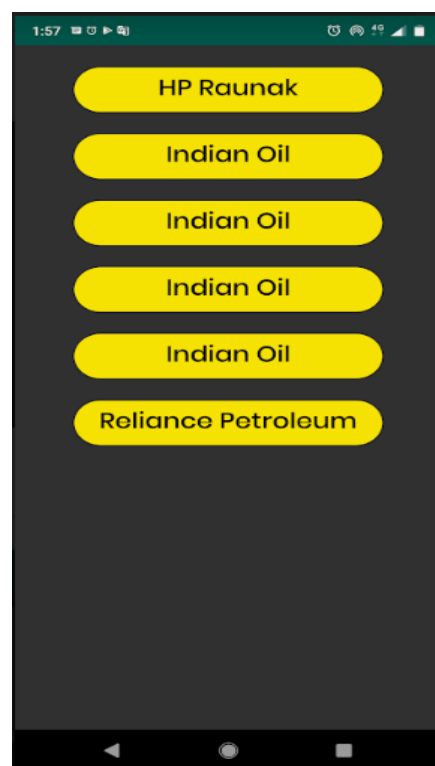


Figure 7. List of Petrol Pumps

Figure 7. shows the activity for the list of petrol pumps. Here, it will show the petrol pumps available. If we click of the petrol pump, it will show us the complete details about the petrol pump such as, name, address, quantity of available petrol. It also has the facility to get the location of the petrol pump and navigate to it. Figure 8. Shows the activity for the petrol pump details.

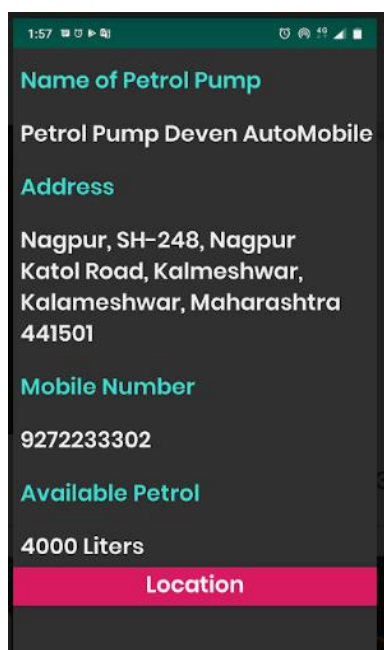


Figure 8. Details of the petrol pump

## V. CONCLUSION

The smart digital fuel indicator is very advance type indicating system. The main advantage of this system is that it can gives accurate value of remaining fuel as well as the vehicle running capacity in km. The operation time taken is very less. All the equipment's have long life, durable & quality material. This project is able to show that simple available hardware and technology can be used to construct a robust fuel level monitoring system.

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