

# Digital Energy Meter and Fuel Theft Detection Using PIC Microcontroller

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**Abstract** – Today's world has so many techniques for measurement of any quantity of fuel. Fuel meter is an analog so that we are trying to make it digitized to show the fuel value digitally. In our project we show the amount of fuel present in fuel tank digitally. Also fuel theft is a problem in all over world. In our undertaking we demonstrate the measure of fuel present in fuel tank carefully. Also fuel burglary is an issue in all over world. In our venture if fuel gets robbery then instant message will send to proprietor of bicycle likewise ringer influences commotion so proprietor of bicycle to get mindful. In conventional vehicle framework fuel burglary of bicycle can be maintained a strategic distance from.

**Keywords** – Fuel tank, GSM, PIC controller, Float sensor, LCD ADV etc.

## I. INTRODUCTION

Nowadays all world become digital so that we can easily deals with real time system. At same time advanced fuel meter additionally executed in ongoing vehicle framework however genuine fuel present in fuel tank of bicycle not appeared in term of digits that show regarding bar or diverting needle so we didn't get thought regarding real fuel present in fuel tank of bicycle. To take care of this issue we created framework computerized fuel meter that demonstrate estimation of fuel in digits and fuel burglary estimation of fuel appeared in digits, for example, 1lit, 1.5lit, 2lit and so forth. The computerized fuel meter is relevant for just for bikes bicycles.

In our undertaking we can include highlights of, for example, remove gone by bicycle inside certain measure of fuel with the goal that we can ascertain execution of bicycle as far as millage. In some cases client fill fuel as far as oil from oil filling pump they filled the oil in carefully yet in our bicycle there is no advanced framework there is bar or avoidance needle framework with the goal that it not give the precise fuel filled by client so the petroleum filling pump proprietor is undermined client yet client do not know about cheating due to traditional system because sometime fuel may minimum or maximum than filled value.

All advantage goes to the oil filling pump proprietor so they commonly tricked with client. All vehicle has bar or redirecting pointer estimation framework with the goal that they don't have the foggiest idea about the correct measure of bunk into bicycle so proprietor of petroleum bunk station effectively undermined client. In this way thought of Digital Fuel Meter is relevant for fuel sign and fuel burglary likewise accommodating to

abstain from tricking of client from petroleum filling station proprietor.

### 1. Analog Fuel Meter

Analog fuel meter widely used in all over world for fuel indication this indicate fuel in three state empty, half and full. Thus we not get actual fuel available in fuel tank of bike. Figure 1 shows the analog fuel meter that deflection type fuel indicator in that available fuel shown by using needle that why it show the only three state empty, half and full not get actual fuel available in fuel tank of bike because it show the level of fuel not exact amount of fuel so that we will stuck in.

We need advance system that show the exact value of fuel digitally not level of fuel by implementing Digital Fuel Meter



Fig. 1 Analog fuel meter.

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### 2. Fuel Thefting

Fuel theft from fuel tank is another measure problem in all over world fuel thefting is malpractice which consists of fuel stole from fuel tank omnipresence of owner of bike. The owner of bike unaware from fuel theft & he will know fill theft when he ride bike next time sometimes because of fuel thefting he have to face lot of problems. To avoid such problem Digital

Fuel Meter should be implemented in bike. Because of Digital Fuel Meter in that PIC microcontroller used so that it send SMS to owner of bike when fuel get theft using GSM module and buzzer will start to indicate that fuel get theft all this process is real time so that more accurate and secure.

## II.MODELING AND DEVELOPMENT OF SYSTEM

### 1. Block Diagram

Circuit diagram is shown in Fig 4. We have used PIC 16F877A Micro controller.LCD16x2 is connected to Micro controller to display the level of fuel and gear. For sending a message of Fuel Thefting we have used GSM Modem. Buzzer is used for alert. Initially limit switch is used to turn ON ignition. After ignition LCD will display current value of fuel level and Gear level. By pressing start switch vehicle will start and it consume some amount of fuel present in the fuel tank.

In running condition of vehicle we must have to change the gear level of vehicle, this changeable gear level is also display on LCD. After some time we will stop vehicle, at that time the current level of fuel is stored in micro controller memory. While fuel Thefting occurs then Fuel level goes down and message send to owner by using GSM Modem. At that time Buzzer will ON. From that we will come to know fuel thefting was occurred.

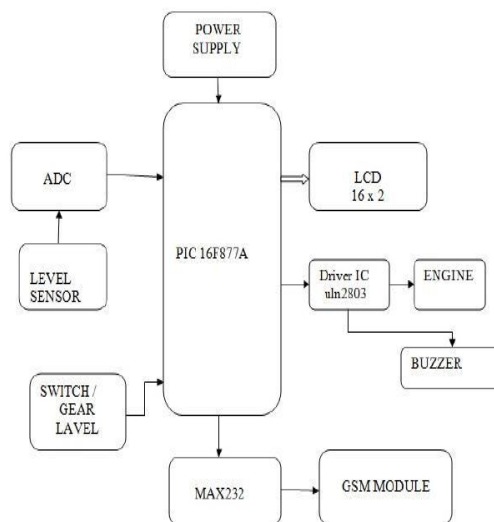


Fig.2 Block diagram of system.

### 2. Algorithm

The digital meter follows a sequence as discussed above. The functions are as follows:

1. Start.
2. Initializing the switch of vehicle.
3. Start the engine of the vehicle.
4. Display the level of the fuel on LCD.

5. Keep the engine ON, and display current value of fuel level.
6. Stop the engine of the vehicle.
7. Store the petrol level value.
8. If the petrol level goes down from stored value during thefting.
9. Then send message to owner and buzzer of vehicle will ON.
- 10.If not then go to step no 7.

### 3. Flow Chart

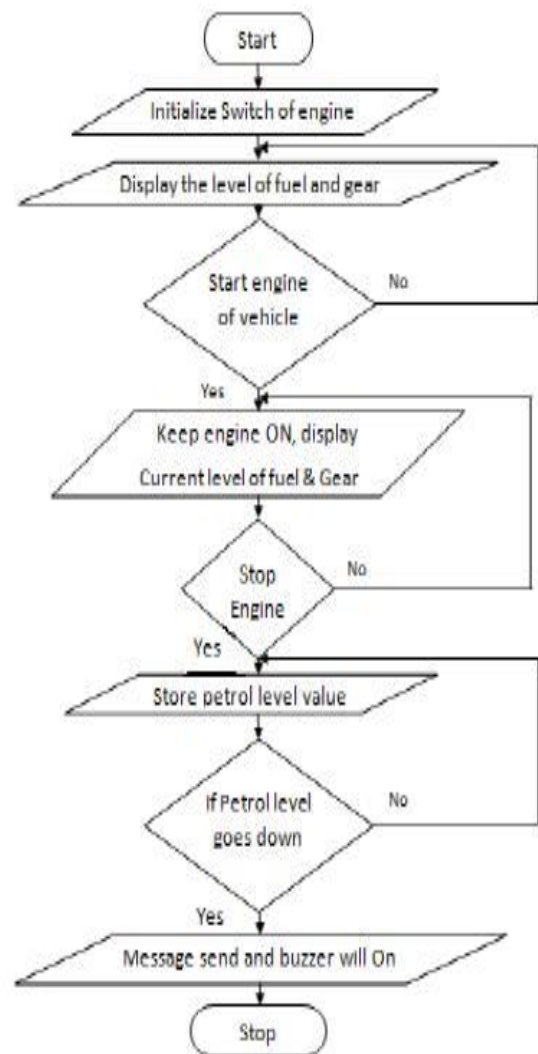


Fig.3 Flow chart.

## III.EXPERIMENTAL RESULTS

As shown in Fig 3 we can see that digital fuel level as 5L and gear level as a zero. In this way we get the fuel level and gear level in the digital format. When there is fuel thefting occurs buzzer will on and message will sent on owner mobile.



Fig.4 (a)



Fig.4 (b) digital fuel meter kit.

#### IV. CONCLUSION

Advanced Fuel Meter utilized for counteractive action from fuel burglary and additionally it show the accessible fuel in tank in carefully. This meter is more favorable circumstances over simple meter by PIC microcontroller and GSM proprietor of bicycle knows from fuel thefting utilizing bell or SMS to the proprietor of bicycle. We increment the standard of estimation framework utilizing Digital Fuel Meter due to Digital Fuel Meter bamboozling with client by fuel filling station can be evaded and execution of framework additionally enhanced with the assistance of Digital Fuel Meter.

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