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# **GSM Based Digital Fuel Meter and Fuel Theft Detection using PIC Microcontroller**

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**ABSTRACT:** Today's world need digital techniques for measurement of any quantity conventional fuel meter are analog so that we 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 i.e. 1lits, 1.5lits, 2lits etc. Also fuel theft is measure problem in all over world. In our project if fuel gets theft then text message will send to owner of bike also buzzer makes noise so that owner of bike get aware. In traditional vehicle system such kind of system not implemented like display fuel availability digitally & fuel theft of bike can be avoided.

**KEYWORDS:** Fuel tank; GSM; PIC controller; Float sensor.

## **I. INTRODUCTION**

Nowadays all world become digital so that we can easily deals with real time system . At same time digital fuel meter also implemented in recent vehicle system but actual fuel present in fuel tank of bike not shown in term of digits that show in terms of bar or deflecting needle so that we did not get idea about actual fuel present in fuel tank of bike it only show level of fuel present in fuel tank. To solved this problem we developed system digital fuel meter that indicate value of fuel in digits and fuel theft value of fuel shown in digits such as 1lits, 1.5lits, 2lits etc. The digital fuel meter is applicable for only for two-wheelers bikes. In our project we can add features of such as distance travelled by bike within certain amount of fuel so that we can calculate performance of bike in terms of millage.

Sometimes customer fill fuel in terms of petrol from petrol filling pump they filled the petrol in digitally but in our bike there is no digital system there is bar or deflection needle system so that it not give the accurate fuel filled by customer so the petrol filling pump owner is cheated on customer but customer do not know about cheating due to traditional system because sometime fuel may minimum or maximum than filled value. All benefit goes to the petrol filling pump owner so that they many times cheated with customer.

All vehicle has bar or deflecting pointer measurement system so that they don't know the exact amount of bunk into bike so that owner of petrol bunk station easily cheated on customer. Thus idea of Digital Fuel Meter is applicable for fuel indication and fuel theft also helpful to avoid cheating of customer from petrol filling station owner

### **A. 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 problem due insufficient fuel.

**Figure 1: Analog fuel meter**

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

### **B. 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

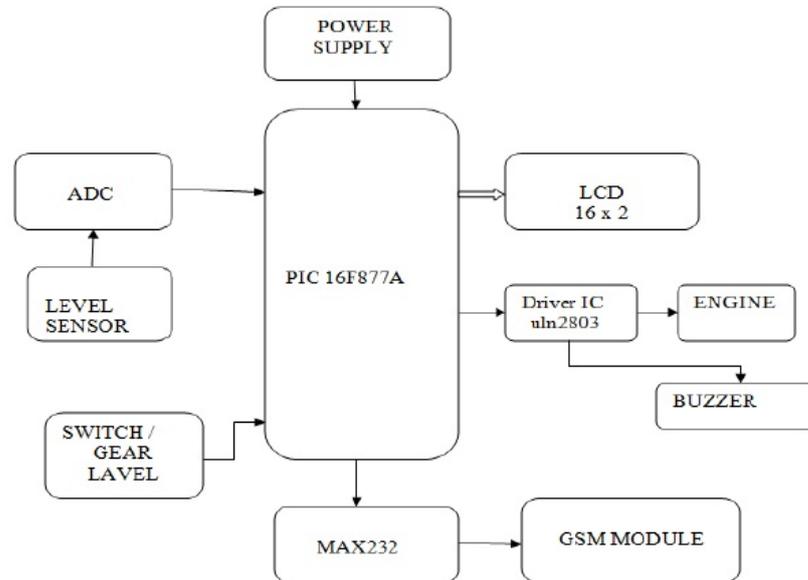
### **C. Gear level indication**

Traditional vehicle system not include gear level indication but in Digital Fuel Meter system gear level indication also provided, from that we get information about gears of system are working properly or not.

## **II. MODELING AND DEVELOPMENT OF SYSTEM**

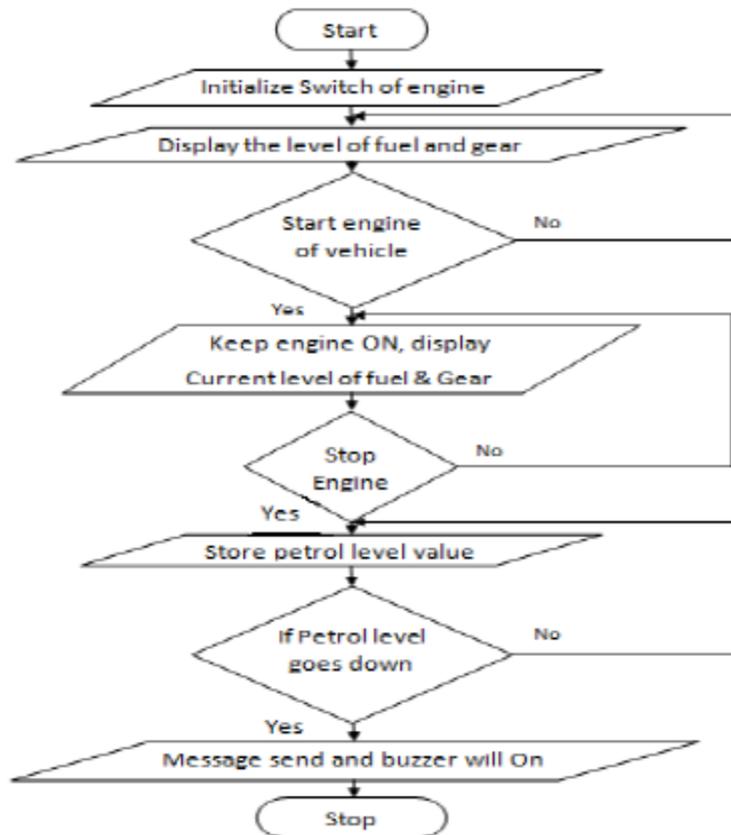
### **A. Block Diagram**

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

**Figure 2: Block diagram of system.****B. 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 and gear on LCD
5. Keep the engine ON, and display current value of fuel level and gear 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
11. Stop

**C. Flowchart****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

**Figure 3: digital meter**

**Figure 4: digital fuel meter kit**

#### IV. CONCLUSION

Digital Fuel Meter used for prevention from fuel theft & also it display the available fuel in tank in digitally. This meter is more advantages over analog meter by PIC microcontroller and GSM owner of bike is aware from fuel thefting using buzzer or SMS to the owner of bike. We increase the standard of measurement system using Digital Fuel Meter because of Digital Fuel Meter cheating with customer by fuel filling station can be avoided and performance of system also improved with the help of Digital Fuel Meter.

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