

# Advanced Fuel Measurement and Lock System

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**Abstract:-** The actual record of fuel filled and fuel consumption in vehicles is not maintained. It results in a financial loss. To avoid this we are implementing a microcontroller based fuel monitoring and lock system. We have used the reed switch which works according to the principle of Hall Effect for sensing the amount of fuel filled in the vehicle and amount of fuel consumed. The world has become digitized now, if we make fuel meter in the vehicle as digital it will help know exact amount of fuel present in fuel tank. In our project, we have made digital fuel meter. Here, we are indicating amount of fuel present in the tank digitally.

**Keywords:-** Arduino; GSM; Fuel, Mileage, float sensor.

## I. INTRODUCTION

Digital fuel meter is also implemented in two wheeler, but they do not shows the exact fuel level which is present in the tank i.e. they shows the amount of fuel in terms of bars and not in numbers or digits like litre or millilitre. That's why we do not get proper idea about fuel present in our tank. We get only approximate level of fuel. So this problem is taken into consideration for our project work of developing the Digital (numeric) fuel indicator system for two Wheelers which shows exact amount of fuel in terms of litre or millilitre. This project mainly concentrates about the indication of fuel level in vehicle tanks. 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. We are constantly hearing about petrol theft. Most of the petrol bunks have fraud the people such that it displays the amount as entered but the quantity of fuel filled in the customer's tank is much lesser than the displayed value. Yet the pumps are tampered for the benefit of the petrol bunks owner. This results in huge profits for the petrol bunks but at the same time the customers are cheated. All the vehicles in India consist of analogy meters hence it is not possible to precisely know the amount of fuel currently the vehicle and also it is not possible to cross check the quantity of fuel filled in the petrol bunk. In this project we focuses on creating a digital display of the exact amount of fuel contained in the vehicles tank and also help in cross checking the quantity of fuel filled at the petrol bunk.

## II. EXISTING SYSTEM

Monitoring Systems are necessary to understand the changes that take place in environments. Remote monitoring and data collection systems are useful and effective tools to collect information from bulk storage tanks

and to monitor the same. The measurement of liquid inside the tank is most important and such systems are useful in industries which are categorized as safety critical systems. The paper presents the architecture and initial testing results of a low power wireless system for tank level monitoring using ultrasonic sensors.

### A. Analog Fuel Meter

All vehicles are having analogy fuel meter. This meter indicates three states of fuel level which are empty, Half and Full. So we cannot judge the actual fuel present in the fuel tank. we will be able to see analogy meter, which shows the fuel level by using needle. But due to this we do not get proper idea about fuel level present in fuel tank. Due to improper knowledge of fuel present in the tank we can undergo in trouble due to low fuel. As considering previous analogy system we are going to implement advanced system, we are doing digital fuel meter and theft detection. In digital fuel meter we are indicating the amount of fuel in the tank in litres. This value in litres will be in numerical digits.

### B. 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

## III. PROPOSED SYSTEM

Advanced Fuel Detection and Lock Security System measures the amount of still fuel present in the petrol tank and display it digitally and also.

It computes the distance it can travel with that fuel with respect to the dynamic rate of change of fuel.

It sends the fuel filled in petrol bunk in liters to the mobile application.

It also secures the vehicle by raising an alarm when it is not locked properly.

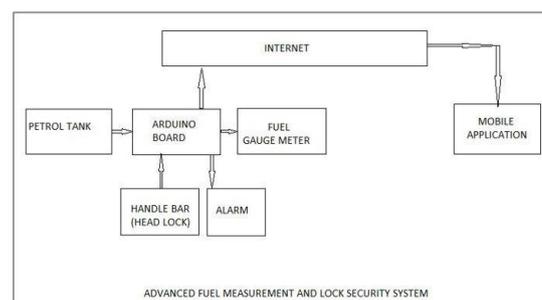


Fig 1:- Proposed System

**IV. RELATED WORK**

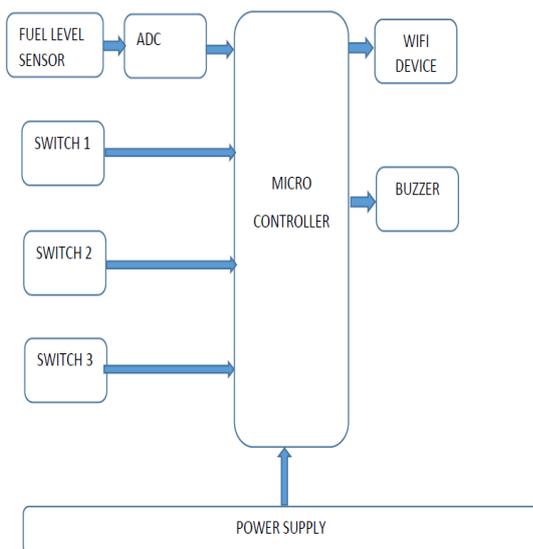
Ranjitha [1]:Today automobile industry has influenced people to a great extent. Nowadays there’s been an increase of accidents because of heavy traffic. Every year around 1.2 million people die mainly because of human errors due to drugs, alcohol and fatigue. These errors are avoided in smart vehicle. In smart vehicle, as the name suggests, the vehicle is capable of motion without any assistance.

N.UpendraYadav [2]: Security in travel is primary concern for everyone. This Project describes a design of effective information system that can monitor an automotive / vehicle / car condition in travelling. This project is designed to inform about the location of vehicle, accident that is occurred to a vehicle to the family members of the traveling persons and leakage of gases from the vehicle which in turn causes accidents.

Dr. Shivaleelavathi B [3]:Due to increasing usage of IoT in automotive Embedded Systems, Smart Car application has gained enormous attention among the users. It’s Difficult to trace missing vehicles in metropolitan cities or any theft activities when the Owner is not around the vehicle. This paper provides an overview of a method used for image capturing and location tracking followed to trace the missing vehicle or malicious activity in the vehicle.

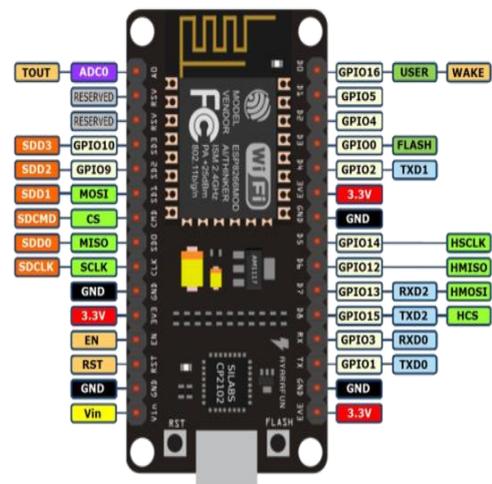
Keertikumar M. J [4]: The journey of IoT from Arpanet to state of art wireless communication in vehicles is presented. The history of the wireless standards used in IoT is described which gives the path followed by the community of IoT using different communication modes. It is observed that Wi-Fi is the speediest of all the wireless standards used for IoT.

**Block diagram:**



**Fig 2:- Block Diagram**

**V. METHODOLOGY**



**Fig 3:- Methodology**

**VI. ARDUINO**

Node MCU Dev Board is based on widely explored esp8266 System on Chip from Express if. It combined features of WIFI access point and station + microcontroller and uses simple LUA based programming language. ESP8266 Node MCU offers

- Arduino-like hardware IO
- Event-driven API for network applications.
- 10 GPIOs D0-D10, PWM functionality, IIC and SPI communication, 1-Wire and ADC A0 etc. all in one board
- Wifi networking (can be uses as access point and/or station, host a webserver), connect to internet to fetch or upload data.
- excellent few \$ system on board for Internet of Things (IoT) projects.

**VII. FUEL LEVEL SENSOR**

The sending unit is located in the fuel tank of the car. It consists of a float, usually made of foam, connected to a thin, metal rod. The end of the rod is mounted to a variable resistor. ... A wiper connected to the gauge slides along this strip of material, conducting the current from the gauge to the resistor.



**Fig 4:- Fuel Level Sensor**

**VIII. BUZZER**

Piezo alarms are used here. Murata Electronics' piezoelectric sound components (piezo alarms) are designed for applications requiring a highly reliable acoustic alarm or audible tone signal. Their reliability extends from the fact that they are solid state construction so they have very few moving parts. These devices can produce either a single or multi-frequency output depending upon operating requirements. The tone is distinct due to the absence of harmonics, and gives an extremely clear, penetrating sound. Their high acoustic output versus low input power requirements make them ideal for a wide variety of applications, especially products powered by battery. They are used as indicators or alarms that call a person's attention to the product. These buzzers and speakers are used in products such as phones, pagers, smoke detectors, and appliances like microwave.



Fig 5:- Buzzer

**IX. ADVANCED FUEL SYSTEM**

One for measuring the capacity of fuel and formulating internally and giving the output of corresponding distance the vehicle can travel using the fuel within.

The main purpose of this system is to measure the amount of fuel present inside the tank, using which it can calculate the mileage, which changes dynamically as the vehicle moves. Another Purpose is to find the difference between the fuel volume, when there is a increase in volume of fuel(i.e Whenever Vehicle starts to fill the tank), once it has determined the difference of the fuel capacity before and after increase in fuel, it can calculate the increased volume of fuel approximately. Which can be send to the Mobile Application which has the feature to receive the message from vehicle and display the increase in fuel amount.

**X. ADVANCED LOCK SYSTEM**

This is to create an awareness about the safety of the vehicles, when it is parked somewhere. This System has an alarm like sound which starts to ring when the vehicle is in the state of unsafe(without being head locked). It prevents the vehicle from getting lost because of the carelessness of the people. This System measures the angle (approximately in the range i.e 45 deg to 60 deg) of the handlebar of vehicle at the instant when its getting into off state if the angle is near to off state it ON the alarm , if the angle is near to lock state it OFF the alarm.

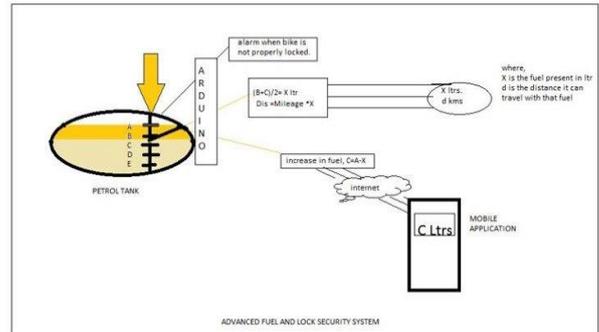


Fig 6:- Advanced Lock System

**XI. DISPLAY IN DIGITAL**

As shown in figure 7, 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 theft occurs buzzer will on and message will sent to owner mobile.



Fig.7:- Display in Digital

**XII. FLOW CHART**

This is the required flow chart for testing the fuel in the automobile and used to the automobile from theft.

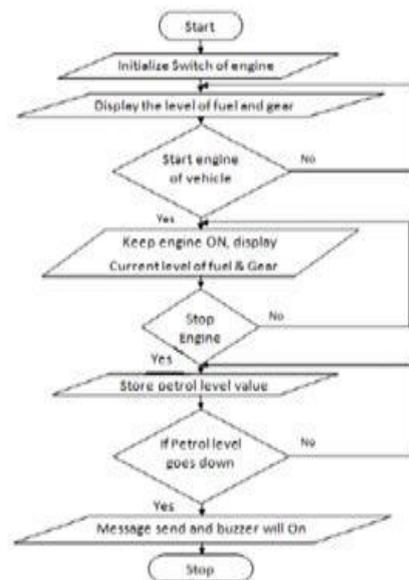


Fig 8:- flow chart

**XIII. CONCLUSION**

We theorised a ANDROID based vehicle monitoring system which is composed of a combination of a low-cost hardware unit and user friendly. The mobile

application software will interact with the hardware interface unit wirelessly via Bluetooth to acquire desired vehicle parameters displayed on the LCD board. These readings will be displayed locally to the user then can be sent to a vehicle maintenance department. I used android application to access the sensors information based on the Bluetooth technology. With the help of sensors I could manage the inbuilt GPS to locate the position of any object by refracting the sensor signals how the position of the vehicle is and immediately a message will be sent to the concerned number.

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