

## “Smart Fuel Flow Measuring System for Vehicles by using Dynamo Power Generation”

<sup>1</sup>Diksha C. Hajare, <sup>2</sup>Nitu B. Kantode, <sup>3</sup>Praful S. Rakhade, <sup>4</sup>Rahul R. Chapekar, <sup>5</sup>Shubham Dudhankar, <sup>6</sup>Prof. Rahul D. Dekate

<sup>1</sup>Students, Suryodaya College of Engineering And Technology, Nagpur

<sup>2</sup>Students, Suryodaya College of Engineering And Technology, Nagpur

<sup>3</sup>Students, Suryodaya College of Engineering And Technology, Nagpur

<sup>4</sup>Students, Suryodaya College of Engineering And Technology, Nagpur

<sup>5</sup>Students, Suryodaya College of Engineering And Technology, Nagpur

<sup>6</sup>Assistant Prof, Suryodaya College of Engineering And Technology, Nagpur

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**Abstract:** In other countries like India with a lot of vehicles, the consumption of fuel from fuel station is large most of the times consumers are not satisfied with quantity or quality of fuel, because the consumer gets less quantity and are cheated. Smart fuel flow meter will calibrate the amount of fuel flowing into fuel tank of vehicles with help of fuel flow sensor. The amount of fuel is measured very accurately and can be viewed in display provided to the system. Flow meters are device that measure the amount of liquid, gas, vapors that passes through them. Smart fuel flow meter will be portable or fixed type. It is battery operated device and is based on microcontroller. In other way this system has Dynamo power generation this system will work on self power generation by vehicle.

**Keywords:** Flow sensor; Dynamo; LCD Display, etc

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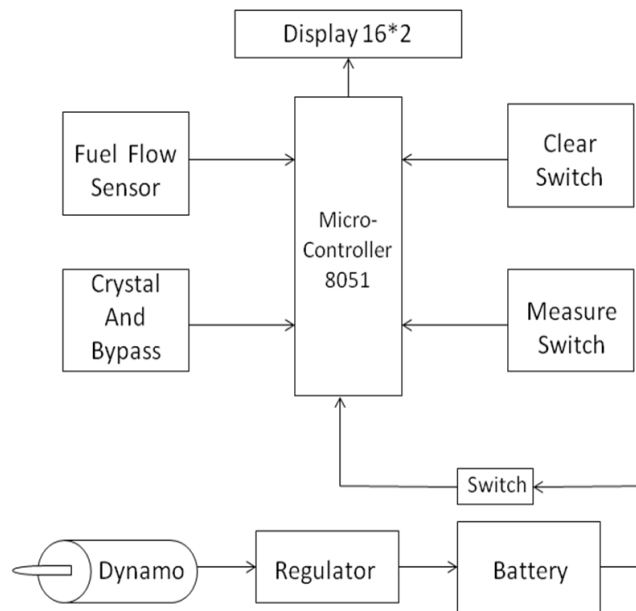
### I. Introduction

Petrol bunk scams are very common in recent time. Almost 81 percentage of the petrol bunks today handle pumps such that it displays the amount as entered, but in reality, the quantity of fuel filled in the customer's tank is much lesser than the displayed value. Such activities result in huge profits for the petrol bunks and the customers are being cheated. It is found out that a proper solution for indicating the accurate availability of fuel in the tank is a digital meter. Some issues with respect to the existing level measurement techniques are identified and so a better alternate digital sensing technology has been suggested, smart fuel flow meter.

We are able to understand the basic and traditional techniques in use for measurement of fuel in tanks. It explains the use of digital meters rather than analog meters which will help to increase the accuracy of measurements. In this project we focus on creating a digital display of the exact amount of fuel contained in the vehicle tank and also help to cross check the quantity of fuel filled at the petrol bunk. Finally once the fuel is filled in vehicles tank at a bunk the device will show the accurate reading.

In this system power is fed through the dynamo generator, It has a DC motor which runs as generator to produce electricity. Initially a DC motor (DC dynamo 12V DC) is chosen to work as generator. Motor is clamped on the wheel of vehicle Hence as the wheel rotates which in turn runs the motor shaft at higher rpm and hence power is generated and then this power is fed to the system using some filters and voltage regulators. It is also observe that vehicle is the main mode of transportation for many people. Most of the time when battery of vehicle gets discharge vehicle will not ignite but battery can be recharge by converting mechanical to electrical energy by using dynamo.

## II. Working of system



**Fig1.** Block diagram of Smart Fuel Flow Meter

Fig1. Shows the schematic block diagram of Smart Fuel Flow Meter for Vehicles using dynamo. Dynamo is a DC generator which generates dc power by using rotational energy from wheel of vehicle. This power is then fed to regulator which regulates power and then this regulated power is stored in battery this supply is then fed to microcontroller 8051. main component of this project is fuel flow sensor which is used to measure the quantity of fuel which will flow through petrol tank of vehicle.

Measure switch is used to give the command to microcontroller to measure the quantity of fuel flow through flow meter. Then crystal and bypass filter is limiting the signals of executing the instructions of microcontroller. Fuel quantity which is measured by flow meter is then shown on display which is having accurate quantity and accurate reading. Clear switch is used to clear the previous readings of system.

## III. Hardware

### 1. Power supply

Dynamo is equipment which converts the kinetic energy into electrical energy generally the dynamos are small permanent magnet alternators. Dynamo starts continuous rotation with planetary gear Experimental setup Fix with one stand with two wheeler body. Chain sprocket running condition experimental setup fixed to produce rotational energy is converted into electrical energy. The generated power is stored to the battery. It can be stored in the battery after rectification. The rectified voltage can be inverted and can be used in various forms of utilities. The battery power can be consumed for the users comfort.



**Fig 2.** Dynamo Generator

### Flow Sensor

OF-Z flow sensor is suitable for measuring oil (heavy oil, light oil, heating oil). It is a flow sensor with elliptic gears that measures micro flow with accuracy.

### Features Specifications:

Flow range: 1-60L/min

Working voltage: DC3V-12V

Accuracy: 0.5 percent

Output signal pulse signal: 2.5mL/P

Max operation pressure: 0.5Mpa with fluid temperature of +20 Degree

Ambient operating temperature: -10 to 70 degree Celsius



**Fig3.** Flow Sensor

## 2. Display

A Liquid-Crystal Display (LCD) is a flat-panel display or other electronically modulated optical device that uses the light-modulating properties of liquid crystals. Liquid crystals do not emit light directly, instead using a back light or reflector to produce images in color or monochrome. LCDs are available to display arbitrary images (as in a general purpose computer display) or fixed images with low information content.

## III. Assets & Appliances

- It can be direct measurement of fuel flow with high measurement accuracy.
- It has self generating power supply by using dynamo.
- It will use on tank of vehicle, to measure the appropriate quantity of fuel which was filled by that petrol pump machine.

## IV. Conclusion

This smart fuel meter is device to measure the amount of fuel flowing in and display the information to the driver in the customized LCD screen. The suitable code will be dumped into the microcontroller for its specific functioning. For future enhancements. This quantity measuring device can be extended to analyses the quality of fuel flowing into the tank .All the different constituents in the petrol can be examined using this smart fuel meter.

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## References

- [1]. Dr. Rajesh Bose, Sandip Roy, “Explaining the Working of a Real-Time Fuel Monitoring System,” Aug 2018
- [2]. Dhivyasri Gal and RajeswariMariappan, Kumaraguru College of Technology, "ADVANCED FUEL LEVEL TRACKING SYSTEM", Electrical,Computer and Communication Technologies (ICECCT), (ISSN:4799-6085)2015 IEEE International Conference , August 2015.
- [3]. Akshay N. Chakole, Vishal A. Dhotre, P.V. Raut, “Generation of Electrical Energy By Dynamo,” International Research Journal of Engineering and Technology(IRJET), Vol 6, Jan 2019
- [4]. Cengel, Y. A and Cimbala, JM, 2010, “Fluid mechanics Fundamentals and applications”, 2nd edition, McGraw-Hill
- [5]. B. Rubini, K.Sasikala and Ravikumar D. “Power Generation Using Gear Setup with Dynamo.”