

# REAL TIME FUEL MONITORING SYSTEM FOR DIESEL GENERATOR USING INTERNET OF THINGS (IoT)

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## Abstract:

This paper discusses on monitoring the fuel level using an IOT. Arduino controller ATMEGA328 communicates these readings to the user over the internet. This system comprises of ultrasonic sensor PGA450 based on high frequency signals and also have some other smart sensors to measure current and voltage. These readings can be viewed at any instant in a web page through the WIFI module ESP8266 and also is connect to the GSM SIM800L V2.0 so that regular updates by are being sent to the user by the text message with a notification when there is a any change in the fuel level that can be seen on a mobile phone.

**Keywords — Diesel generator, Fuel Monitoring, Arduino.**

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## I. INTRODUCTION

Diesel generators are commonly being used as a temporary source of power in domestic as well as industrial applications. But in case of domestic systems we don't have any monitoring systems for the fuel level excepting the analog value that would be placed outside the diesel generator. The main aim of this paper is to propose a system that would monitor the fuel level and send the alert message when the fuel level is lower than the base value to the mobile phones through the GSM and also it give a real time value of the fuel level in the web page that is created especially for this system. All the

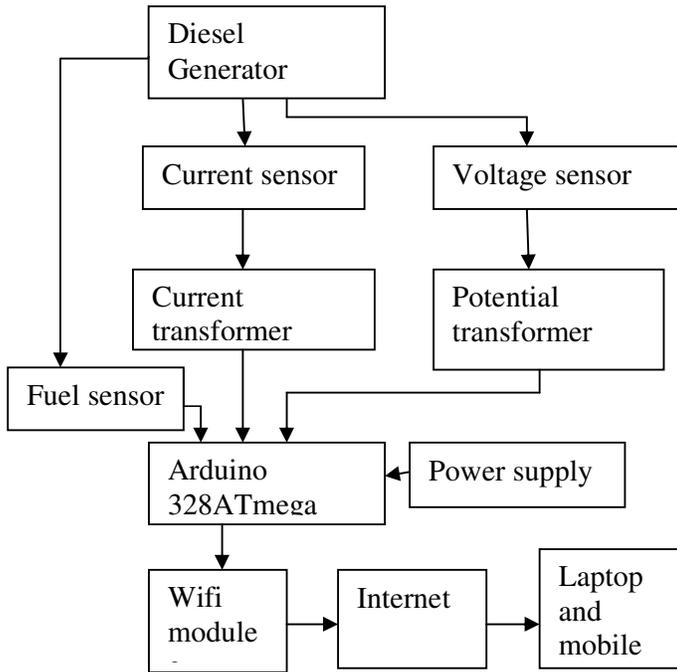
information are stored in cloud storage so that they can be used for future reference.

## II. PROPOSED SYSTEM

The proposed system for monitoring the diesel generator consists of different sensors such as ultrasonic sensor, current sensor and voltage sensor. It also has a current transformer and a potential transformer that are used to step down the high current and high voltage into equivalent low values so that they could be fed into arduino328ATMEGA. The arduino serves as an intermediate between the input and output. The values at any instant are sent to the user through the wifi module at real time. The user interface is connected with the cloud storage

that stores all the values. The information is updated to the user from this cloud storage. The values can also be compared as they are updated at each instant. If the fuel level is lower than the base level of the tank then it send a alert message to the user through the GSM.

### III. BLOCK DIAGRAM



The above block diagram is a simple diagrammatic representation of the diesel generator monitoring system for rating of 380KVA.

#### A. Diesel Generator

The diesel generator we are using here is of rating 380 KVA. It has a liquid cooling system with 1500 rpm and also the power factor is 0.8 (lagging).

#### B. Current Sensor

A three phase current sensor is used so that power in each of the phase can be calculated. The current measuring circuit is based on the Allegro ACS712 IC sensor. The ACS712 IC is a linear current sensor which can measure the AC and DC current. It can be classified into three types according to the maximum current sensed ( $\pm 5$ ,  $\pm 20$ , and  $\pm 30$  A). In this paper, the ACS712-30A is used as the current

sensor. The ACS712-30A is a current sensor that can measure currents up to  $\pm 30$  A and with 66 mV/A output sensitivity on a +5 V DC power supply.

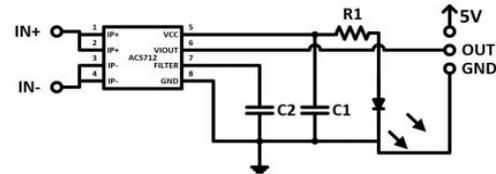


Fig.1.circuit diagram of three phase current sensor.

#### C. Voltage Sensor

The voltage sensor circuit that is designed to measure the maximum AC voltage that is less than 450 V. The output from the voltage transformer is directly fed into the potential transformer.

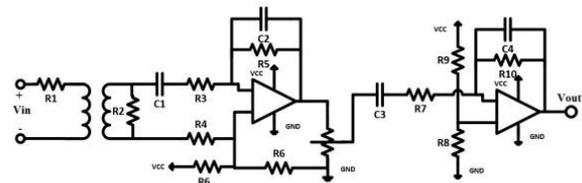
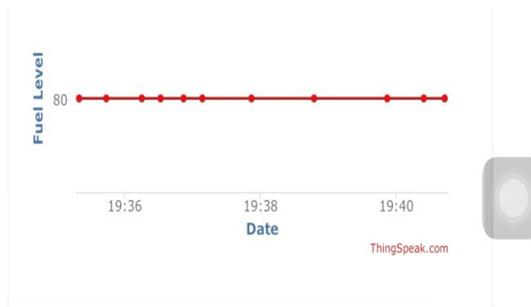


Fig.2.circuit diagram of a three phase voltage sensor

#### D. Ultrasonic sensor

Ultrasonic sensor PGA450 module comprises of one transmitter and one receiver. The transmitter can deliver 30KHz-70KHz ultrasonic sound while the maximum receiver is designed to accept only the reflected sound waves. The receiver ultrasonic sensor that is kept next to the transmitter shall thus be able to receive reflected 30-70 KHz, once the module faces any obstacle in front. Thus whenever any obstacles come ahead of the ultrasonic module it calculates the time taken from sending the signals to receiving them since time and distance are related for sound waves passing through air medium at 5cm-11m. The ultra sonic sensor is connect to the arduino is shown in the fig3.





## CONCLUSION

This paper proposes a smart monitoring system in which current, voltage and fuel level could be viewed at any instant. This system can offer smart service utilizing IoT technology to users which administrate the diesel generator. It can be used to reduce the generator accident and predict the system fault. This technology can be adapted to other distributed energy resource. In the future, these smart monitoring systems are used in various

applications such as solar, wind and other renewable energy sources.

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