

Fuel Monitoring System Using GSM Module

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ABSTRACT

This study includes information about all the components used in the project that is fuel monitoring system. The components discussed and explained in the study of this project are Bluetooth module, GSM module and arduino, transistor BC547, buzzer, capacitor, resistor, LED, bridge wave rectifier, diodes and 7805 IC. The study also covers existing system, DFD for present system, What's new in the system to be developed, Problem Analysis, Software Requirement Analysis, Specific Requirements, System design of the project, all the design notation used in the project, a detailed design, flowchart of the whole system, testing of the project, how the project is going to be implemented. The study also contains current status of the project, remaining areas of concern, technical and managerial lessons learnt. All the source codes and necessary project snapshots are also inserted in this project study. The report also contains brief information on some components that we have utilized to make a correspondence way between the vehicle, the proprietor and another free GSM hub which can go about as the provider of the fuel. In this framework, we track and screen the fuel level of the fuel tank with the assistance of various parts. We have embedded a Bluetooth module, a GSM module and arduino in the venture.

Keywords

Fuel Monitoring, IOT, Arduino Uno, GSM Module, IR Sensor.

1. INTRODUCTION

In this project, fuel monitoring system, we have used different components to create a communication path between the vehicle, the owner and another independent GSM node which can act as the supplier of the fuel. In this system, we track and monitor the fuel level of the fuel tank with the help of different components. We have inserted a Bluetooth module, a GSM module and arduino in the project. The Bluetooth is a wireless technology standard for exchanging data from fixed and mobile devices and building personal area networks (PANs). The Bluetooth module is responsible for sending live notifications of the fuel level to the vehicle owner's mobile phone. The task of sending live notification to the mobile phone is done with the help of an application that is arduino. This application sends and receives data directly on Smartphone via Bluetooth. The other module that is GSM module is used in the project to establish communication between the GSM/GPRS system and computer system, in our case, it is the smartphone. It also requires a SIM that is Subscriber Identity Module. It is the user equipment that communicates with the mobile network. The GSM modem in our project sends out message notification to the registered mobile number about the level of fuel in the tank. This registered mobile number can act as the provider of the fuel. Along with these modules, other components like transistor BC547, buzzer, capacitor, resistor, LED, bridge wave rectifier, diodes and 7805 IC are also used for the building of the project. This work of Fuel Monitoring System is an initial step for better fuel management and also becomes the scope of our work. The data collection with sensors and

also by implementing the micro controller is done at different speed range and also with different load condition. Based on the inference from the collected data suggestions are made for better utilization of the fuel. Equation has been developed between the economic factor and its influencing factors like load and speed. In future we hope that this engine performance monitoring will be highly helpful for automation Related Work.

Fuel Monitoring Problems

Even a regular vehicle user, do not know as when to fill the fuel for the vehicle as and because one uses to fill it by weekly or daily basis. And now particularly for a new person it becomes a difficult task to identify the level of fuel. So it becomes a customary problem for a long traveler. Here an experimental work has been carried out to suggest an equation to predict the time of filling based on the distance basis.

2.RELATED WORK

The work proposed by V Asha et al. makes an endeavor to plan and build up a Remote Fuel Monitoring System (RFMS) with a 8-Bit Microchip Microcontroller. The configuration of this model gives an entrance of ongoing operational parameters, for example, Diesel/Petrol Fuel Levels, Temperature, Oil Levels[18] and Voltages Generated and a correlation with their separate basic edge limits. The RFMS ceaselessly screens these parameters and the Information is then pushed on a cloud on the Net utilizing the GSM/GPRS Combination [1].

The work proposed by Su Zhou et al. Fuel cell vehicle as a hot topic has been studied for a long time, how to monitor and get reliable performance data will be very helpful for its further improvement. In this paper an online monitor system, where EP100 MCU of Freescale, Lab VIEW software of NI Co. and RS232 serial port are applied[17], is introduced for a fuel cell commuter[2].

This paper proposed by G. Bucci et al. and he developed the Monitor and managing system for a PEM fuel-cell (FC) stack. This is a stand-alone unit that embodies two microcontrollers, hardware and sensing circuits, an LCD and a numeric pad. The proposed system acquires the most important gas parameters: mass flow rate, pressure and temperature. The output current and voltage are also acquired[3].

The work proposed by M.K. Kaushik et al. In present scenario everything is changed with digital revolution but still in some fields like automobiles digital revolution is yet to come, where analogue type of fuel gauge meters are used for indication of fuel[1]. With analogue indication meters, there is a lack of accuracy and precision. Using of digital indication meters reduce the parallax

errors, increases speed with accurate measurement of reading and provides an optimal control over the usage of petroleum. To overcome this we are introducing a digital fuel gauge meter using digital fuel sensor technology, LCD display and fuel sensor and arduino-UNO board[4].

The paper proposed by Pavankumar Naik et al. Car gadgets i.e. sensors, actuators, smaller scale controllers, instrumentation boards, and correspondence systems speak to a noteworthy development range in the car area. The push zones of car hardware incorporate execution and dependability, security, comfort, diversion and obviously the natural point of view[5][18].

The paper proposed by Hamid Mohammed Almaden et al. Technological development is growing rapidly worldwide, so many machines, factories, and even homes use these technologies. The target of this paper is to avoid Cars congestion and long waiting in the queue of fuel pumps, excessive employment. The commission is not available financially. And lack of reliability in the sales system[6].

The work proposed by Kanyaphorn Chaiwong et al. Bed type gasification stove was selected to use in the household instead of a traditional cookstove. It can use with biomass in order to reduce the consuming the fossil fuel. The main problem of using a small size Bed type gasification stove is an igniting in the early stage of higher temperature chamber[7].

The work proposed by S R Ashwini et al. Due to various activities in nuclear power plants such as radiation leakage, nuclear fuel recycling and other activities, low level radiation causes various health issues such as infertility, weakened immunity. When a nuclear radiations are leaked to an open environment the atmospheric parameters like temperature, smoke, humidity, sound and carbon monoxide level increases[8].

The work proposed by R Sasvanth Narayan et al. In recent years, vehicle Monitoring systems helped riders in gathering real-time information about their vehicles. This paper puts forward, the advancements which can be done using the data's gathered from the monitoring systems and optimize the vehicle. The monitoring system comprises of the following units processing unit, sensors unit, storage unit and a communication[9].

The work proposed by Varsha Sahadev Nagmode et al. Traffic congestion monitoring and controlling it is biggest challenge on many cities in this day, which affects environmental life and disturbs our daily life routine. Due to increasing population, number of roads and vehicles are increases, which create many problems such as travel time delay, fuel wastage, air pollution and transport related issues[10].

The work proposed by S.Vigneshwaran et al. The present age requires the data time to time. The utilization of innovation have been expanding step by step. So we are making arrangements for the mix of present innovation with the prerequisite of data transmission, we got ready for the imaginative methodology of "Plan of Bus Tracking and Fuel Monitoring System". To beat the disadvantages of the past techniques for paper based and we acquaint a task with track a vehicle utilizing GPS and GSM. This Vehicle Tracking System can likewise be utilized for Accident Detection Alert System, Soldier Tracking System and some more, by simply rolling out not many improvements in equipment and programming and

broadly in following Cabs/Taxis, taken vehicles, school/universities transports and so on. The transport following framework is a practical and productive framework. Utilizing this framework four application will be created. First application is setting up correspondence between school server and transport framework which is equipped for giving constant information with respect to the present area of transports. Second application is sending a gathering messages for example ready messages to the understudies holding up at the following stop, changes in current course, transport number, and so forth., thus it spares the hour of understudies[11].

The Work was proposed by Ravi Gatti et al. Due to the limited availability of the Non renewable energy sources it is very much essential to utilize them efficiently. This paper introduces a method which deals with the effective utilization and management of the fuel in fuel. conveying vehicles by Automatic Electronic system (AES). This method involves Monitoring of the fuel level, pressure and spillage[12].

The paper proposed by P S J Van Heerden et al. Over the past decade the wind energy sector has grown worldwide from an installed capacity of 31.1 GW in 2002 to 273 GW in 2012. South Africa is forecasted to be one of the largest future developing markets for wind generation, particularly due to the need to introduce clean renewable energy into the generation capacity that currently consists predominantly of fossil fuel plants. This paper presents results of on-going research that focuses specifically on the condition monitoring of the slip ring component found in a doubly-fed induction generator, the most widely used generator topology throughout the wind energy sector. The slip ring component is maintenance intensive and that results in frequent unplanned outages and serious plant failures. Online condition monitoring of the slip ring component, especially in quantifying and trending ageing effects, has the potential to result in improved maintenance strategies and the prevention of failures. The approach investigated in this research involves the use of parameter estimation techniques to determine condition-related model parameters using C-code and S-function models implemented in Matlab and compiled as a Simulink library[13].

The work proposed by B Midyuroya et al. Microbial fuels cells (MFCs) are bio-catalyzed electrochemical systems whose function is to convert chemical energy from waste waters to electrical energy. In this study, the electrochemical performance of air cathode and power generation in MFCs is investigated. The operational stability of the MFC with anode of carbon brush and air cathode carbon cloth[14].

The paper proposed by Rahmat Aryaeinejad et al. And goal of this work is to establish basic data and techniques to enable safeguards appropriate to a new generation of nuclear power systems that will be based on fast spectrum reactors and mixed actinide fuels containing significant quantities of "minor" actinides, possibly due to reprocessing, and determination of what new radiation signatures and parameters need to be considered[15].

3.4 Disgraceful fuel Monitoring :

The present framework that is utilized in vehicle tracks the fuel level of the fuel in the fuel tank and shows it on the vehicle dashboard. It implies that the individual who needs to think about the degree of fuel in the vehicle's fuel tank should be in the vehicle and the vehicle should be turned on for the data to get showed on the dashboard. In spite of the fact that the present framework is alright however not progressed. The arrangement of fuel checking should be updated. The present framework doesn't work when the vehicle is off and the driver is away from the vehicle. Also it doesn't take care of the issue of tank depleting and misrepresentation endeavours which are extremely normal issue.

The present system needs to have live fuel tracking or monitoring even when the vehicle is off. It also needs to have a graphical interface that can display information over smartphone as smartphone is the only device that is along with person everytime and it does not have to do anything with the turning On and Off of the vehicle.

4.RESULTS AND DISCUSSION



Figure 4.1:

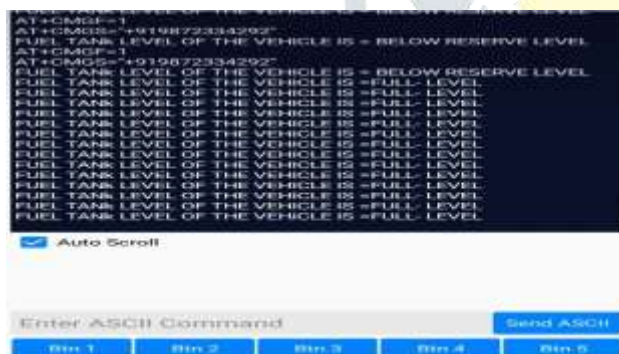


Figure 4.2 :

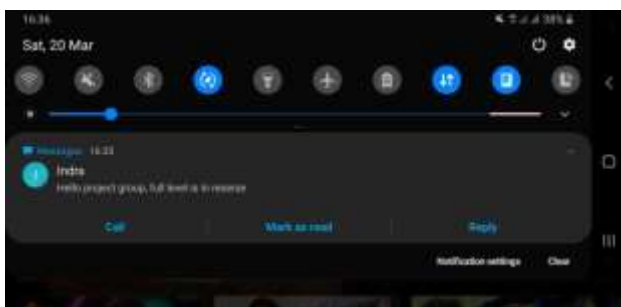


Figure 4.3:

The current status of the project is that it can be used in vehicles with a little bit of work that packing the whole system within a small space. This will make the whole system compressed and ready to be inserted in any small space inside the vehicle. Otherwise the whole system is working and ready to be used.

The other GSM node in the system can be used as supplier of the fuel. This way fuel can be delivered to the vehicle owner. That other GSM node which is inside the Smartphone can be registered as a delivery service number. Thus, helping the people, in need of the fuel.

4.1 Hardware Connections:

Figure 3: Working model of Fuel Monitoring System

- Connect the Vcc stick to the positive rail on your breadboard.
- Connect the Gnd stick to the negative rail on your breadboard.
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- Connect the Trig stick to any advanced stick on the arduino.
- Connect the Echo stick to any computerized stick on the arduino.
- Finally, interface the positive rail of the breadboard to 5V stick on the arduino and the negative rail of the breadboard



to the Gnd stick on the arduino.

5. CONCLUSIONS

Fuel monitoring system provide good quality of services to the users. It provides fuel monitoring of their vehicle on time. System saves the time of the user because it provide live view of their fuel if there is any chance of fuel empty then user can full their tank on time there is no chance of time wasting for example if user is going to somewhere they can check their fuel reading easily .It provides security to the user's fuel because in present time theft is everywhere fuel. Stealing is continuously going on so user can save their fuel.

5.1 FUTURE ENHANCEMENT

In future works, this framework can be enhanced by including different. Fuel monitoring system provide good quality of services to the users. It provides fuel monitoring of their vehicle on time. System saves the time of the user because it provide live view of their fuel if there is any chance of fuel empty then user can full their tank on time there is no chance of time wasting for example if user is going to somewhere they can check their fuel reading easily .It provides security to the user's fuel because in present time theft is everywhere fuel. Stealing is continuously going on so user can save their fuel.

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