



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact Factor: 6.078

(Volume 8, Issue 3 - V8I3-1159)

Available online at: <https://www.ijariit.com>

## Petrol accuracy system using cloud computing

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### ABSTRACT

*In this project, we fabricated an IOT chip to monitor the accuracy of fuel on both heavy and light vehicles. The system consisting of parts like liquid flow sensor, bug convertor, and node MCU 8266. This system can be used in industries to find the loss of fuel in heavy and light vehicles and it can also locate the exact location of that vehicles. We use node MCU IOT chip to monitor the fuel accuracy of the vehicles where we coded a program by using C language in Arduino and dump the code in the chip and that chip is connected. We use node MCU as a modern tool used in different way, we creating a web page which use cloud computing technology to monitoring the system. We learnt about the fuel tank and fuel flow system by using this system we can reduce fuel theft in heavy vehicles as well as we can locate exact location of the vehicles. We have designed a new tank cap to fix the system by which we can get accurate fuel level. We have analysis about the fuel tank system form mechanical workshop and node MCU through internet. We use bug convertor and node MCU as a modern tool. It is useful for all common people to protect their vehicles from theft. This project can be helpful for all lite and heavy vehicles owners. Components present in the system are high quality as well cost efficient. By working in a team, we learnt about the team co-operation as well as team sprit quality. We have use C language to communicate with the system as well as we use drawings to design the system. Proper management of expenses to create an economical system. We use this system through our life. The project carried out by us made an impressing task in the field of Automobile industry. It is very useful for the people who use heavy as well as lite vehicles and the owner of the vehicle can also identify the exact location of their vehicle. The world is moving towards the digitalization and in petrol pump there is still human to human interaction. Our aim is to reduce labour work and malicious activities happen in petrol pump and automated digitalized mechanism. In our system, we are using RFID card because RFID is a versatile technology which is use in many real time applications.*

### Keywords:

#### 1. INTRODUCTION

Now a day everything has been digitized. For example, online banking, cash management, tax filling and computerized petrol pump. Considering the computerized petrol pump, a lot of work has been already done in this field. That is some petrol companies provide the smart cards to the customers to access the petrol at the petrol station of their company. Now-a-days the usage of vehicles is increasing day-by-day. The dispensing of fuel to fill all these vehicles at fuel stations leads to a lot of complications. The vehicle driver has to pay cash for this fuel. Sometimes they have to pay more amounts for the fuel which was not filled by the bunk worker. This IOT based petrol pumps can reduce the manpower. These are less time-consuming, require low maintenance cost and should be more reliable. They are easy to operate. We can also prevent misuse of the fuel. In our system we are using cloud technology to access petrol at different petrol stations of different companies' petrol across the country and here, we are connecting all these petrol stations using single web server and this web server access is secured by a password which is known only to the petrol companies.

#### 2. LITERATURE REVIEW

In [1], Priyaranjan Mishra et al. works had been carried out in many papers regarding the fuel station and embedded system, we have been selected as a reference for our proposed system. The power shutdown is major problem nowadays in India, it could be 2 hrs in normal days and during summer it increase 2 to 4 hrs. In urban area it may be 4 to 8 hrs a day. In the fuel station this is major problem so they used diesel generators (DG) to compensate it for a short period but it may increase using DG will be a non-profit for them. And this makes huge impact in sales as well as profit for them, to avoid like this interruption solar panels are used for backup purpose. This makes huge investment at beginning stage and compares with DG after years this makes huge amount to owners at last. Motors, and other pneumatic devices. A pneumatic system controlled through manual or automatic Directional control valves is selected when it provides

a lower cost, more flexible, or safer alternative to electric motors and actuators. Pneumatic systems operate on a supply of compressed air which must be made available in sufficient quantity and at a pressure to suit the capacity of the system.

### **3. DESCRIPTION OF EQUIPMENT**

#### **NodeMCUESP8266**

Node MCU is an open-source firmware for which open-source prototyping board designs are available. The name "NodeMCU" combines "node" and "MCU" (micro-controller unit). [8] The term "NodeMCU" strictly speaking refers to the firmware rather than the associated development kits. [citation needed] Both the firmware and prototyping board designs are open source. [8] The firmware uses the Lua scripting language. The firmware is based on the Eula project, and built on the Espressif Non-OS SDK for ESP8266. It uses many open source projects, such as lua-cjson [9] and SPIFFS. [10] Due to resource constraints, users need to select the modules relevant for their project and build a firmware tailored to their needs. Support for the 32-bit.

#### **WATER FLOW SENSOR**

- YF-G1 DN25 1 inch Water flow sensor used for flow measurement it consists of a plastic valve body, a water rotor, and a hall-effect sensor. When water flows through the rotor, rotor rolls Its speed changes with different rate of flow. The hall-effect sensor outputs the corresponding pulse signal. Specifications of 1 inch Water Flow Sensor - YF-G1DN25: -
- Mini. Working Voltage: DC 4.5V
- Working Voltage: DC 5V~18V
- Flow Rate Range: 2~100L/min
- Water pressure resistance:  $\geq 2$ MPa
- Operating Temperature:  $-20 \sim 85$ C
- Insulation resistance:  $\geq 100$ M $\Omega$
- Characteristics of Flow pulse:  $f=(4.8 \cdot Q)$   $Q=L/Min$
- Accuracy:  $\pm 3\%$

#### **Features of 1 inch Water Flow Sensor - YF-G1 DN25: -**

- Compact, Easy to Install
- High Sealing Performance
- High Quality Hall Effect Sensor

#### **Battery**

In our project we are using secondary type battery. It is rechargeable type A battery is one or more electrochemical cells, which store chemical energy and make it available as electric current. There are two types of batteries, primary (disposable) and secondary (rechargeable), both of which convert chemical energy to electrical energy. Primary batteries can only be used once because they use up their chemicals in an irreversible reaction. Secondary batteries can be recharged because the chemical reactions they use are reversible; they are recharged by running a charging current through the battery, but in the opposite direction of the discharge current. Secondary, also called rechargeable batteries can be charged and discharged many times before wearing out. After wearing out some batteries can be recycled Batteries have gained popularity as they became portable and useful for many purposes.

#### **Buck Converter**

A buck converter (step-down converter) is a DC- to-DC power converter which steps down voltage (while drawing less average current) from its input (supply) to its output (load). It is a class of switched mode power supply (SMPS) typically containing at least two semiconductors (a diode and a transistor, although modern buck converters frequently replace the diode with a

second transistor used for synchronous rectification and at least one energy storage element, a capacitor, inductor, or the two in combination. To reduce voltage ripple, filters made of capacitors (sometimes in combination with inductors) are normally added to such a converter's output (load-side filter) and input (supply-side filter). Switching converters (such as buck converters) provide much greater power efficiency as DC- to-DC converters than linear regulators, which are simpler circuits that lower voltages by dissipating power as heat, but do not step-up output current. The efficiency of buck converters can be very high, often over 90%, making them useful for tasks such as converting a computer's main supply voltage, which is usually 12 V, down to lower voltages needed by USB, DRAM

### **4. WORKING PRINCIPLE**

In this project, we fabricated an IOT chip to monitor the accuracy of fuel on both heavy and light vehicles. The system consisting of parts like liquid flow sensor, bug converter, and node MCU 8266 this system can be used in industries to find the loss of fuel in heavy and light vehicles and it can also locate the exact location of that vehicles. We use node MCU IOT chip to monitor the fuel accuracy of the vehicles where we coded a program by using C language in Arduino and dump the code in the chip and that chip is connected. We use node MCU as a modern tool used in different way, we creating a web page which use cloud computing technology to monitoring the system. We learnt about the fuel tank and fuel flow system by using this system we can reduce fuel theft in heavy vehicles as well as we can locate exact location of the vehicles. We have designed a new tank cap to fix the system by which we can get accurate fuel level. We have analysis about the fuel tank system form mechanical workshop and node MCU through internet. We use bug converter and node MCU as a modern tool. It is useful for all common people to protect their vehicles from theft. This project can be helpful for all light and heavy vehicles owners. Components present in the system are high quality as well cost efficient. By working in a team, we learnt about the team co-operation as well as team spirit quality. We have use C language to communicate with the system as well as we use drawings to design the system. Proper management of expenses to create an economical system. We use this system through our life time until all people convert from diesel or petrol vehicles to electrical vehicles. The project carried out by us made an impressing task in the field of Automobile industry. It is very useful for the people who use heavy as well as lite vehicles and the owner of the vehicle can also identify the exact location of their vehicle. The world is moving towards the digitalization and in petrol pump there is still human to human interaction. Our aim is to reduce laborer work and malicious activities happen in petrol pump and automated digitalized mechanism. In our system, we are using node MCU 8266 cards because node MCU 8266 is a versatile technology which is use in many real time applications. Node MCU 8266 to access petrol at different petrol stations of different companies' petrol across the country and here, we are connecting all these petrol stations using single web server.

### **5. MERITS , DEMERITS & APPLICATION**

#### **Merits**

- Automation and Control.
- Saving Money.
- Data Breach.
- Minimize human effort: Minimize human effort.
- Enhanced data collection.
- Reduced use of other electronic equipment.

#### **Demerits**

- Security and privacy.
- Technical complexity.
- Connectivity and power dependence.

#### **Applications**

- It is very much useful for car owners and auto- garages.
- Track the petrol leakage
- Used in lorries to find the diesel theft
- We can also use this idea to find the water theft
- We can also get the exact location of the system or else the vehicle
- Product flow Monitoring
- Inventory Management
- Safety and Security
- Quality Control
- Packaging optimization
- Factory Digitalization
- Logistics and Supply Chain Optimization

#### **6. CONCLUSION**

The proposed system will provide an accurate and real-time fuel monitoring system. This is a suitable and practical solution for fuel monitoring and location tracking. Therefore, this system can be implemented in every vehicle to avoid facing fuel theft, finding the nearest fuel pump and vehicle location. The authors used a central monitoring system to control all vehicles by using the mobile application. The main theme of this thesis is key way for making smarter by make utilize of well growing IoT platform and information and communication technology ICT to reduce the work and energy as well as security aspects in fuel station. The login credentials which given by the user is validated and forward to agency main page. The agency main web page contains full details of the fuel station like the controls, stock and current readings. Authorized dealer need not worry about status of the fuel station if he is not in station. At security aspects by this we can stop the fuel theft in fuel station by labours or owners. The service engineer should have to request an OTP if he wants to repair any pump by his registered mobile no, so the security level has been increased by this proposed idea. In this technical world, all the gadgets and devices has been converted into IoT enabled devices by get their data's and analyze easily using IoT platform with the help of information and communication technology. By this method of gadgets, the time as well as work will be reduced and it will make some more

money to save.

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