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## Automatic fuel filling system

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### ABSTRACT

Recently fuel stations are controlled manually. These fuel stations consume more time and it also requires manpower to operate. Day by day there is rapid growth in the number of vehicles and machines in today's advanced and automated world. The requirement of fuel is also increasing day by day because of vehicles and machines totally depend on fuel. The consumer needs to wait in the queue as there is a rush at the fuel station especially at the gas pumps it is very common. The fuel station in our countries is more time consuming which causes a waste of time. In this project, we developed an automated fuel station management system which can overcome the disadvantages of the present system. The result of this methodology places cashless transactions and authenticated system. It will adversely affect the financial status of our country. Can help fuel stations to become faster and less time-consuming. Also, a system is developed in the vehicles to measure the quantity of fuel filling in the vehicle's tank. The required quantity of fuel is typed using the keypad. The amount typed is sent to the pump system through data modem and the corresponding fuel for that price will vend to the vehicle's tank. The amount debited and the balance amount is sent to the user's mobile through GSM. In case of any emergency in pump GSM send SMS to authority.

**Keywords**— GSM, Fuel, Cashless transaction, Flow sensing

### 1. INTRODUCTION

In recent days the distribution of fuel is controlled manually. Even though there are a lot of automatic systems are existing but still, there are some constraints. For the safe distribution of the fuel, we are trying to develop an advanced system. In our country there so many problems in fuel distribution such as waste of time, lack of reliability in sales system, corruption in a transaction for the security of fuel station GSM technology is used to send message to authority. In this system, we use a flow sensor to sense the flow of fuel into the tank. The required quantity of fuel is typed using the keypad. The amount typed is

sent to the pump system through data modem and the corresponding fuel for that price will vend to the vehicle's tank.

### 2. LITERATURE SURVEY

Even though there are various automatic fuel filling systems exist, the serious issue is that many updates to the technologies we are not able to reduce the corruption rate. In this paper, the system uses real-time authentication. Here manpower is reduced because of automated self-service. Robbery of the fuel is avoided due to the RFID system used. It is a highly sensitive system. Data communication over long distance is possible due to the GSM system. The system is more secured in nature because use the smoke sensor to prevent any accidental situation. In any case, if the customer tries to swipe the unauthorized card RFID system will reject the card. The system allows customers to pay just for the amount of fuel get and prevents the illegal sale of fuels by assigning a predefined amount of fuel within a specified period of time.

Using a microcontroller, the petrol pump is occupied with a smart card reader or write. At the petrol pump the driver swap the card and the smart card reader read the amount in the card and will display it on the LCD. The driver then enters the quantity of petrol that has to be filled using a keyboard. The corresponding amount is calculated and deducted from this petrol card. Electrical pump automatically fills the tank.

After this various innovation made and the modern petrol pump are developed which are treating nowadays. Apart from this, we have added some new features into the existing system such as flow sensor, cashless transaction.

### 3. PROPOSED SYSTEM

The system contains two units:

- Vehicle Unit
- Pump Unit

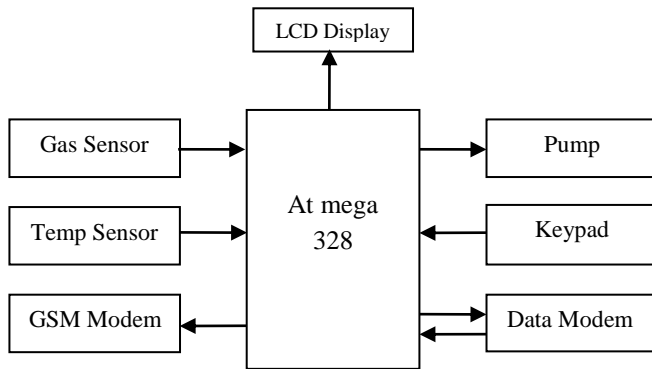


Fig. 1: Pump unit of the proposed system

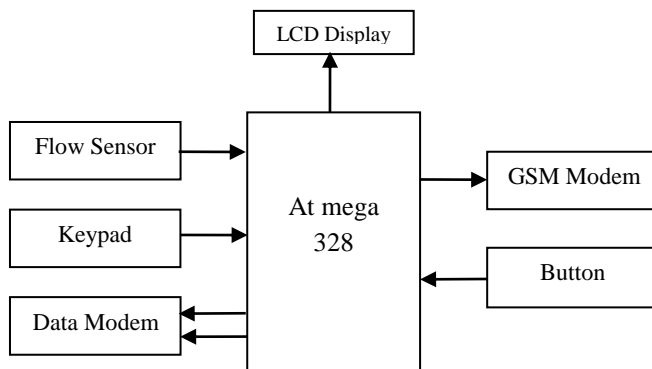


Fig. 2: Vehicle Unit of the proposed unit

The vehicle unit consists of a button when we press the button there establish a connection between two units with the help of data modems at both units and the vehicle's account will be verified. The updated price of the fuel will be displayed on the LCD screen provided in the pump. Customers can either enter the price of the fuel needed or quantity of the fuel in the LCD screen provided in the vehicle unit. If the value entered by the customer is the quantity of the fuel the machine will automatically convert the quantity to the corresponding price and it will check whether the account is having sufficient balance. If the account is having sufficient balance the amount corresponding to that fuel will be deducted and the process of pumping the fuel starts, otherwise the "LOW BALANCE" message will be displayed on the LCD screen.

The vehicle part contains a flow sensor it will measure the rate of fuel flow through it. It consists of a plastic valve body, flow rotor and Hall Effect sensor. It used at the inlet end to detect the amount of flow. When fuel flows through the sensor, a magnetic rotor will rotate and the rate of rotation will vary with the rate of flow. The Hall Effect sensor will then output a pulse width signal and connect it to the microcontroller. Thus we can monitor the quantity of fuel pumped in your Vehicle. The temperature sensor in the pump unit will detect the variations in the temperature of the fuel. If the temperature exceeds the threshold value an emergency message will be sent to the authority through GSM to avoid hazardous situations.

### 3.1 Components Required

**3.1.1 At Mega 328:** At mega controller is an 8-bit microcontroller. It can handle the data sized of up to 8 bits. It is an AVR based microcontroller. It's built in the internal memory is around 34 KB. It operates ranging from 3.3.V to 5V. It has an ability to store the data even when electrical supply is removed from its biasing terminal.

**3.1.2 Temperature sensor:** It is to measure the temperature of the fuel. It is a device that gathers data concerning the

temperature from a source and converts it to a form that can be understood either by an observer or another device.

**3.1.3 Flow sensor:** Flow sensor will measure the rate of flow.

**3.1.4 Keypad:** A keypad is a set of buttons arranged in a block which usually bear digits, symbols and usually a complete set of alphabetic letters.

**3.1.5 LCD:** It is a device for display 5x8 dots with cursor is used. +5V and +3V power supply is used. It works in a 1/16 duty cycle.

**3.1.6 GSM modem:** A GSM is a specialized type of modem operates over a subscription to the mobile operator just like a mobile phone.

**3.1.7 Data modem:** Data modem can be used for applications that need two-way wireless data transmission.it features an adjustable data rate and reliable transmission distance.

**3.1.8 Pump motor:** Make block water pump motor-DC12V/370-04PM has a 12V motor and tough thermoplastic body. It is widely used for pumping liquids. The total size is D27x75mm.

## 4. CONCLUSION

Comparing to other technologies this paper is most relevant and useful in the current society. As the rate of fuel is increasing day by day this project is very efficient and useful to the current society. We are implementing a system to reduce corruption. In this system, it is dealing with a secure and fast transaction. The rate of fuel is updated daily so they cannot be cheated. Users are able to know how much fuel is pumped. In case any chance explosion messages are sent to authority. So these projects expected to be an efficient automatic fuel filling system.

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