

## RFID Based Smart Petrol Pump

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**Abstract:** This article suggests a layout during which a device would be able to track the number, cost and time of a car's refill, and then inform the registered owner of the fill up. The machine is split into two parts: a gas pump and a smartphone app. Customers can access the service and view their accounts using the smart phone. An RFID that will serve as a checking account is also available to customers. Any approved refill point can refund the card. For each customer, after the RFID card has been scanned and a specific code provided, the fuel deduction from the fuel will be manual. Fuel costs will be charged from the RFID card and reported to the customer through real-time email technology. All details of the transaction (e.g., refill number, refill form, refill cost, payment amount, prior balance, money transfer length, etc.) will be sent via Wi-Fi connectivity to a server.

**Keywords:** RFID, LCD, keypad, RFID readers, IoT.

### 1. Introduction

Each of mankind's prettiest and most significant interest production is the petrochemicals. It is the most commonly used resource today, due to the growing amount of cars used on a daily basis for the journeys as the form of revocation [1]. As far as fuel tank optimization is involved, a great deal has been done in this area, but in terms of safety, certain experimentation is needed [2]. Present system at the gasoline bunks includes human input for the phase of fuel loading, i.e. the business needs a bunker operator to fill the fuel in the passenger automobile and pay the fee for that payment [3].

The Radio Frequency Identification (RFID) tech can be beneficial to the users as the fuel logging or transaction method will have no trouble querying [4]. Users / vehicle owners may give their operator the RFID card for replenishing the automobile, rather than giving cash money. Detailed details can be shown at this stage about each fueling phase [5]. This knowledge is very useful to this system; because it gathers data containing valuable stats on the different amounts of fuel, the vehicles that get the gas and the time and date of fuel [6]. All will be web based and machine-driven processing of actual-time data, which means less interaction between people. The automation mechanisms employed in the proposed project overcomes all the

limitations of the current method [7]. The need for station staff is removed by petro cards provided to passengers, as the contact between the user and the petro card slot is now actually occurring, giving the customer direction to proceed with each step seen on the LCD. The card runs on RFID system. [8]. Congestion signal is controlled by calculating in a given time period the number of trucks that cross the reader area [9]. The data the antenna capture are given to the reader through multiplexer switch [10].

## **2. Literature Survey**

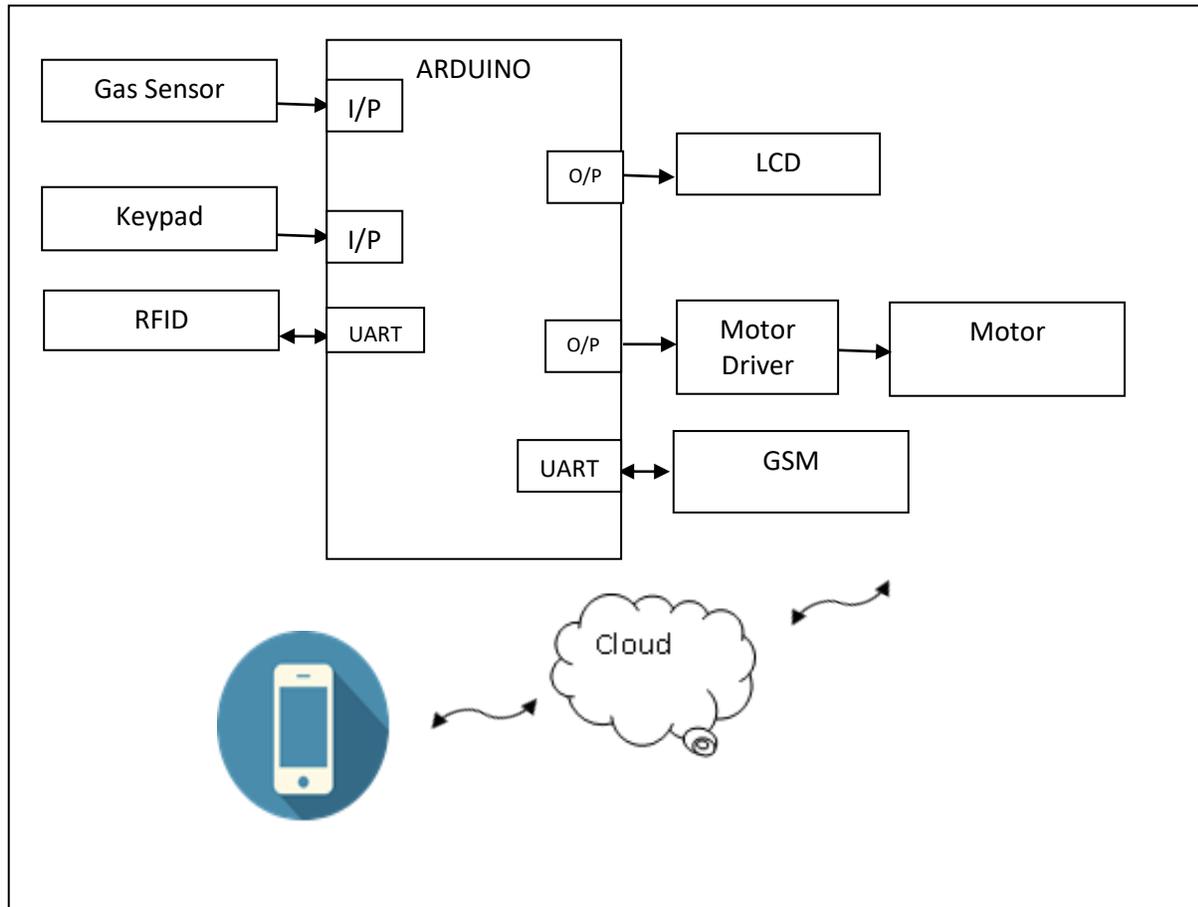
Everything is digitized. In many cutting-edge systems, nearly all gasoline pumps have a manipulate unit that plays obligations that encompass controlling the electrical pump, adjusting the set pressure, sliding speed, and closing off the electrical pump [11]. However, it can still lead to many human mistakes to save the money people need. In this proposed gasoline pump automation system, we will use RFID cards to access fuel at fore service stations across the United States and numerous fuel companies across the United States. Fuel tank automation with prepaid card is using GSM identification device using PIC microcontroller, GSM and RFID technology. This device allows customers to know how much gasoline is filled [12]. It also provides accuracy, saves customers valuable time and avoids misunderstandings and disputes about gasoline filling operations.

Whenever the dispenser fills the cylinder, simply place the RFID card next to the RFID reader. The microcontroller then looks at the measurements from the RFID reader and regenerates the changes according to the client's prerequisites [13]. This digital fuel siphon reduces the chance of trouble-free delivery of coins by preventing human intervention and providing some protection to customers while refueling at transit stations. This gasoline siphon contains an Atmega328 microcontroller, RFID module, LCD display, keypad, and AC siphon and safety device. This means that while the RFID reader scans the cardboard, it asks for a three-digit passphrase and increases the alert, suggesting that multiple inappropriate passkeys have been entered at least twice [14]. And if you keep the thought of entering the correct passphrase into the system, the system will ask for the quantity and in addition tell you what the fixed quantity is. As soon as the quantity is reached, the engine starts to generate and the fuel inside the gas tank is clogged inside the fuel seller. Gas Tank Automation using RFID and GSM Technology is using Arduino Uno Controller, GSM and RFID technology. The machine provides customers with an RFID card and reloadable miles to increase the refueling process and prevent unauthorized refueling [15]. Here, the machine is equipped with an RFID card reader that reads how much should be inside the card.

## **3. Proposed System**

The purpose of this work is to create a system that can deduct the fuel discharged from the user card depending on the RFID system immediately. Liquid dispensing equipment is

typically located in various places in daily lives, such as shops, bus stations, transport hubs, cash registers.



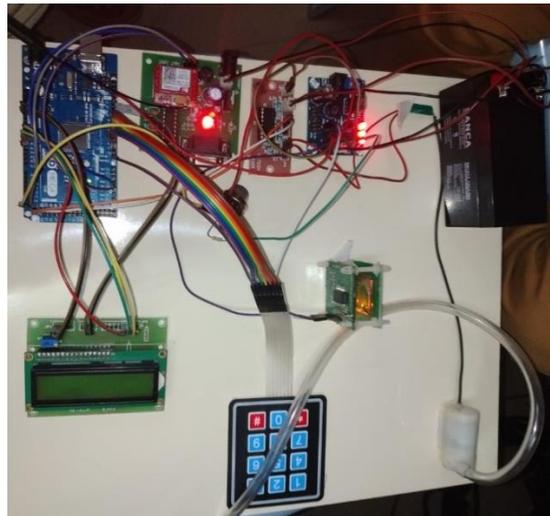
**Figure 1:** Block diagram

Figure 1 shows the block diagram. We are placing a RFID reader for different persons and for a specific person there is a code. And so, then it will read amount of petrol place in the tank like Rs.50 or Rs.150 for bikes and for heavy vehicles it may vary up to certain values. The amount is certainly deduced from the prepaid card. For this use there is a GSM module through this net is being given. The end users can also be accessed with IoT (Blynk app).

Through IoT we can able to monitor the live processing of the transaction and also, we can get a mail alert to the concerned users for the amount debited. By using the blynk app we can able to monitor the gas sensor data. And so, the passenger can able to view the conditions of the systems.

#### 4. Results and Discussions

The fuel deployment into the tank is as accurate as possible. And an email notification to the users is takes less amount of time. At the LCD the step-by-step process of the fuel entry is initiated and also, we can be monitor into the Blynk app using IoT. This will enhance the mobility of the users to the devices.



**Figure 2:** Prototype model of RFID based smart petrol pump.

The above design depicts the RFID based fuel entry system in case of fire accompanied in the vehicle and the prototype model shows in Figure 2. We are proposed a gas sensor to sense the flame or fume gases so that it can automatically turn OFF the fuel. From this experiment we can able to lower the labor cost.



**Figure 3:** RFID reader and hardware module enclosure

Figure 3 shows the RFID reader and hardware module enclosure. Inside the room, materials related to the gadget module were delivered from the fuel distributor, along with small switches, bits, solenoid valves and consoles installed inside the version. This module controls the gas engine and can be considered like all other implicit distributors.



**Figure 4:** RFID reader with dispenser

Figure 4 shows the unit of RFID reader with dispenser. As soon as the car enters the box path, the RFID user is ready to check the tag assigned to that car. If can refuel this car, the car will allow the micro switch to send the important mark that marked on the gas cylinder.

## 5. Conclusion

With the help of a microcontroller, the fuel pump is prepared as a smart card reader/writer. In a gasoline pump, the propulsion changes the cardboard, and a smart card reader can read the amount inside the card and display it on an LCD. The amount of gasoline fill using the keyboard

will then include the thrust. That amount is calculated and deducted from his petrol card. The electric pump then turns on according to the amount entered, fills the reservoir and turns off normally. Although in several security industries, RFID also included, framework consists mobile app and integrated gas disposal system with RFID innovation making the device more effective, safer and client-friendly. In many developed countries, there are certain regulated gas stations which generate machine receipts printed. This will fix the problem of cheating. The design concept, however, provides real-time confirmation because it removes human encounters in the refueling process, which implies low labor costs in refueling the organization of the station owners.

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