Self-Service Automated Petrol Pump Using RFID

Vidadala Srija[1], G. Laxmi Priyanka[2], Gattadi Vinatha[3], K. Anitha[4]
[1, 2, 3, 4]Assistant Professor, Department of ECE
[1, 2, 3, 4] St.Martin's Engineering College, Dhulapally, Telangana, India

Abstract- *Everything has been digitized. In many existing systems, almost all petrol bunks have a controlling unit to perform the tasks like managing the electrical pump, driving the display, measuring the flow and accordingly turning off the electrical pump. But still a person is required to collect the money and there is possibility of many human errors. In this petrol pump automation system, we are using RFID card to access petrol at different petrol stations of different petrol companies across the country and here, we are connecting all these petrol stations using single web server which is secured by a password that is only known to the owner, it also displays the amount required and balance amount left. This system consists of Atmega328 microcontroller, RFID module, LCD display, keypad, AC pump and alarm*

I. INTRODUCTION

The rise in the amount of vehicles in the country in current days has led to the traffic jams in each and every city. The transportation of vehicles at gas stations has caused a lot of difficulties anywhere in India. Usually drivers pay the money with cash. But sometimes, they may pay more amounts due to lack of small money change on hand[3]. This Automatic fuel Pump is designed to reduce manual work and build up an automatic system to execute the task one after the other with RFID technology. These systems are very much dependable and a smaller amount time overwhelming strategy[1]. The components used in this project are 8051 Microcontroller, RFID tags, Power supply, an LCD display, a Motor driver and RFID reader. Fuel goods are one of the expensive and unusual manifestations of the nature. The appropriate, utilize and delivery is a most significant job to carry on these supplies. A fuel area is a help which sells fuel and oils by means of fuel allocators or in any case called program are utilized to push Diesel, lamp fuel, and so on, into vehicles and to investigate the monetary expense of the made items disseminated in this way[1].

Businesses are occupied in downtown and rural public transportation as well as other transportation companies, big fuel consumers need to organize the liberation of fuel to avoid or at least reduce the abuse of petroleum products. The urgent situation of RFID technology has distorted the conventional approach of information gathering. RFID tags have more qualities like non-contact, reading speed, no wear, long life, customer friendly and the safety purpose than the traditional information collection method [5]. We have seen the use of RFID in vehicle identification, toll gate money collection, and traffic management. This article offers the execution of fingerprint based RFID technology is to reduce manpower at the time dispensing the fuel and human error while collecting the cash at all our Indian cities.

II. EXISTINGSYSTEM

In recent days the petrol bunks are managed physically [3]. Normally in petrol bunks there is a person to person communication. Approximately all petrol bunk has a microcontroller to handle the electrical supply, trip the screen and also execute all tasks. But still a person is necessary to collect the cash [5]. These fuel stations are requiring more time and require more manpower. In order to reduce manpower, I have proposed one system. This system is designed to reduce this human relations and errors. Therefore, there is no need for workers to refuel [5]. In this system, all drivers have an RFID card, which can be recharged by us or some places. The gasoline pump is equipped with an RFID reader, which will read our fingerprint and enter the amount, the motor will start, and gasoline will be injected into the gasoline tank from the fuel dispenser.

III. PROPOSEDSYSTEM

In this section we are explaining about our proposed system along with its working. The below figure 1 shows that Block diagram of Self-service automated petrol pump using RFID

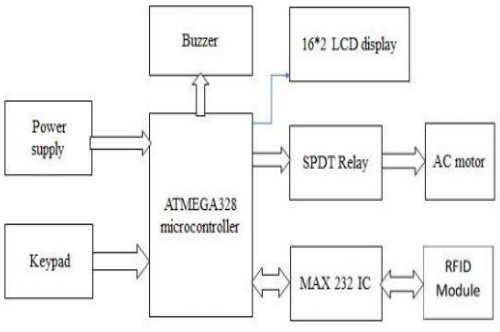


FIG.1 Block diagram of Self-service automated petrol pump using RFID

Main components present in our proposed system are

1. Micro controller (ATMEGA328)
2. Reset button
3. Crystal oscillator
4. Regulated power supply (RPS)
5. LED Indicator
6. RFID
7. Buzzer
8. Relay
9. Keypad

IV. WORKING OF A PROPOSED SYSTEM

In this petrol pump automation system, we are using RFID card to access petrol at different petrol stations of different petrol companies across the country and here, we are connecting all these petrol stations using single web server which is secured by a password that is only known to the owner, it also displays the amount required and balance amount left. This system consists of Atmega328 microcontroller, RFID module, LCD display, keypad, AC pump and alarm. The RFID card is first shown to the RFID reader, the reader identifies the card and will ask for our password which will be entered by us manually through the keypad. Then the system will ask for the amount of petrol to be pumped which is again entered and then the required amount of petrol is filled.In case the petrol is insufficient or if the amount in the card is not enough for the petrol it will be displayed on the LCD.

We show the RFID card to the reader

- The reader reads the ID present in the card and will ask for the user password.
- The user now enters the password through the keypad.
- Now, the system recognises the user and will ask for the amount of petrol required.
- The user will now enter the petrol quantity and then the petrol is pumped out.
- After the petrol is pumped, the balance present in the card is displayed on the LCD screen.
- If the amount present in the card is insufficient or if the password entered is wrong or even if our petrol tank is full, the system gives us a buzzer sound indicating that there is a problem.

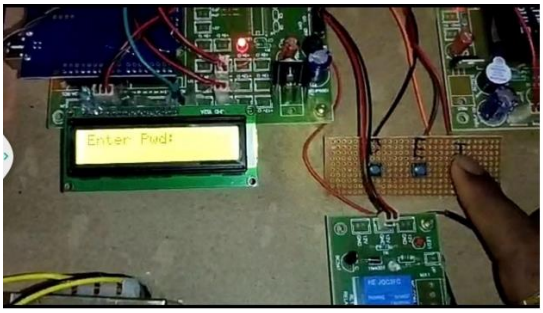
V. RESULTS AND DISCUSSIONS

This is the prototype of our project displaying the Arduino board, RFID module, relay, keypad and motor.

The LCD display shows that the system is asking to swipe a card, so that the RFID module can recognize us.

We show our card to the RFID reader which reads the unique ID number of our card.

After reading the card, the system asks us to enter our password and now we enter our password using the keypad.



The system now recognizes us and displays that our password is correct. If the password entered is wrong, then we get a buzzer sound and the display shows that the password is incorrect.

The system now asks to enter the amount of petrol required to be pumped

Since the balance in the card is sufficient the petrol is pumped out with the help of the motor. If there is not enough balance in the card then the display shows that there is insufficient balance.

ADVANTAGES:

- The server access is secured with a password.
- Reduces the risk of carrying money every time.
- Also displays the balance amount.

VI. CONCLUSION

Petrol pumps with our technology can be possible to operate all the time without the help of manpower. In this project there will be a centralized server having the database of the customer like Customer Name, Card No, depend upon the use of the card for purchase of petrol the petrol balance will be deducted and the balance amount will be shown Future scope: We can add a GSM module so that we get the text messages regarding the transactions and the balance amount present in the card

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