

Petrol Pump Automation System using RFID and GSM Model

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Abstract

Everything has been digitized. In many existing systems, almost all petrol pumps have a controlling unit to perform the tasks like managing the electrical pump, drive the display, measure the flow & accordingly turn OFF the electrical pump. But still a person is required to collect the money and there is a possibility of many human errors. In this proposed 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. This web server access is secured by a password which is known only to the petrol companies. Whenever we want to fill the tank from the fuel dispenser, we just have to place the RFID card near the RFID reader. Then the microcontroller reads the data from the RFID reader and performs the action according to the customer requirements. This digital petrol pump system also provides the security for the customers for filling petrol at the Petrol stations by avoiding the involvement of human beings, hence reduces the risk of carrying money every time. This petrol pump system consists of Arduino Nano, RFID module, LCD display, Keypad, buzzer and pump.

Keywords: *RFID, LCD display,*

INTRODUCTION

Rare and valuable creations formation takes millions of years which insist proper utilization of the resource. In present scenario, fuel stations are operated manually which consist a controlling unit to perform various tasks. The present manual fuel stations consume more time and require substantial man power. Moreover, it is prone to malpractices and higher probability of human initiated errors. These limitations restrict installation of fuel stations in

distant areas. The main aim of this paper is to deal with all stated problems by developing an automated petrol dispensing system using RFID technology. Such a system enables a user to use a RFID based prepaid card to access petrol at fuel stations. Whenever the user wants to fill the tank from the fuel dispenser, user has to enter the amount first and then place the RFID card near the RFID reader. The Arduino Uno manages to read the data from the RFID reader and perform action according to the customer requirements as well as the amount deducted from the user's cards.

PROBLEM STATEMENT

Everything has been digitized. In many existing systems, almost all petrol pumps have a controlling unit to perform. The tasks like managing the electrical pump, drive the display, measure the flow & accordingly turn OFF the electrical pump. But still a person is required to collect the money and there is a possibility of many human errors. In this proposed 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

RESULTS AND DISCUSSION

The complete prototype as developed was tested and verified results. It successfully fills the required quantity of fuel from smart card and operation of the project is clearly verified. RFID system is a versatile technology. This system is used in many application and real time application. In our application, RFID system dispenses the accurate amount of fuel which reduces the misuse of the fuel. And it also reduces the man power. And if the customer tries to swipe with the unauthorized card, the RFID system rejects the card. In this way the system is so secured. To obtain best performance the RFID readers and Tags must be in good quality is so secured.

PROCESS & WORKING

First we analyzed the requirement then we design single part as per our requirement. After that we select the material for the project. In the second stage we manufacture as per requirement & design particular part. In the third stage we purchase the standard parts as per specification required to us. In the fourth stage we start assembly in this stage we assemble the part under the guidance of the teacher. After the final assembly of the system we start testing of it.

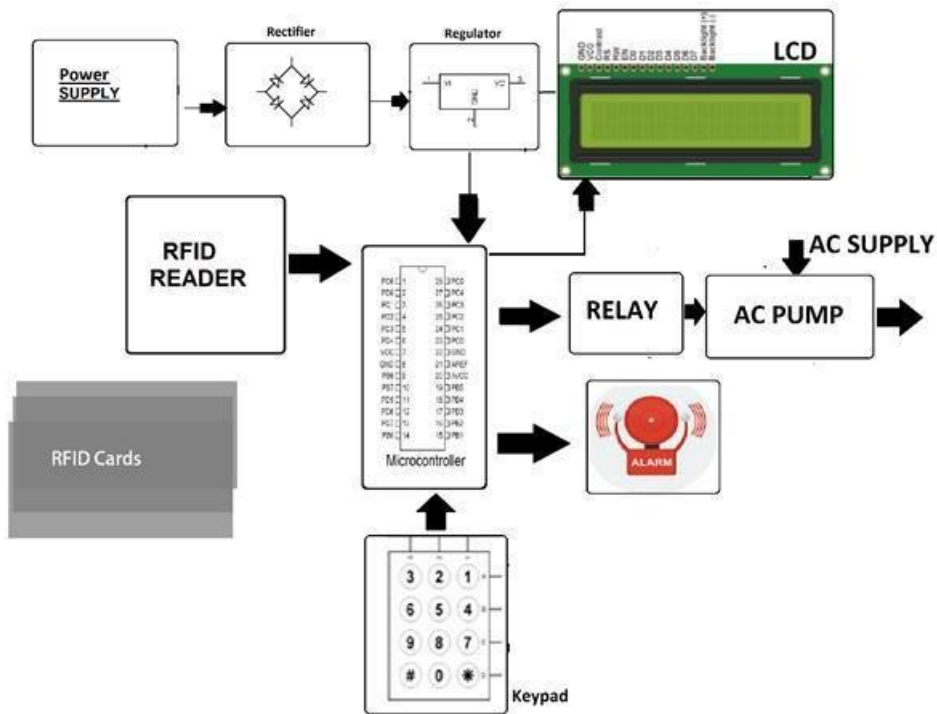


Figure no.1: Architecture

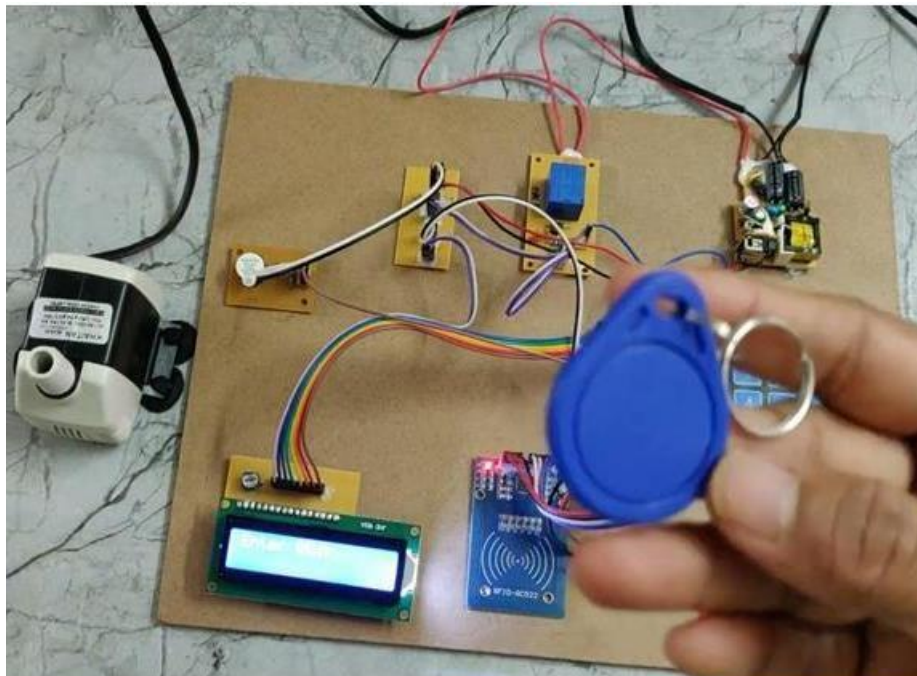


Figure no.2: Design of model

CONCLUSION

The above mentioned model proposes to remove all the shortcomings of the manually operated petrol pumps by replacing them with automated ones. RFID is a versatile

technology, easy to use and it can be efficiently used in this real time application. The proposed model consists of certain goals like ensuring right amount of fuel dispensed, removing all human errors by the use of RFID cards and ensuring customer's trust for a fair sale of the product. These automated fuel stations provide a lot more advantages as they reduce man power with the automated self-service. With this simple technology in use, any person can easily access for fuel at Fuel Stations. Apart from this all, these systems are less time consuming compared to the traditional ones. The technology proposed is very cost efficient and has low power consumption as well, which sets the major benchmark in today's scenario.

FUTURE SCOPE

It has been observed that the proposed system is extremely beneficial as it provides the secure and cashless digital system, which avoids fuel thefts in recent digital India concept. The proposed model of RFID Based Fuel station automation using Arduino Uno can be further enhanced by making it password protected. It can have featured on biometric security in which only the person to whom the RFID card belongs, can only allowed to use it for access at fuel stations. In this, each user will be having the unique pin or biometric for their respective RFID card. If the user enters the correct credentials, he will be asked to enter the amount and further process will take place. On the other hand, if the entered credential is wrong, he will be given two more chances for the same, failing which access will be denied and security alarm will be raised alerting for the same. This will help to authenticate as well as secure the user. The unauthorized user is disallowed for any access to the system.

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