

IOT Based Fuel Dispensing

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ABSTRACT

In this paper, the IOT Based Fuel Dispensing is build using PIC Microcontroller. Nowadays the user is not satisfied with the amount he paid for the fuel. To satisfy their needs the RFID card are used. The dispenser is put in within the fuel station with RFID scanner that goes to read the RFID card and exhibits the available balance on LCD display. The amount is entered through the keypad, the system calculate the amount of operation from the electrical fuel pump and initiates the operation of fuel dispensing. When the required fuel is dispensed it gets close automatically. It is serially connected with Microcontroller and Wi-Fi module ESP8266 that sends notification to the user over the mobile. Therefore this work can create the fuel bunk management system with no limitation and satisfied the needs.

Keywords-RFID (Radio Frequency Infrared Detector);

ARTICLE INFO

Article History

Received: 8th March 2020

Received in revised form :

8th March 2020

Accepted: 10th March 2020

Published online :

11th March 2020

I. INTRODUCTION

In the present increasing technology in almost all the sectors long established systems are being replaced by the forward technologies. That's why we designed the automatic CNG bunk using RFID card. In case of long established CNG pump, the driver of vehicle has to pay for fuel with cash money and may have to pay more than the distribute fuel due to lack of small money change. Now days, most fuel pumps are manually operated which require more manpower and are time absorbing. For placing fuel pumps in a unapproachable area, it is so hard to provide the good facilities to the costumer. Mass transit companies focus to include qualities and recent technologies in their system target to reduce the service manpower. Introduction of technology in hand over the service has changed the hand over service design. This enclose self-service technologies like self-service fuel distribute. This system has been made ideal by using computer and recent technologies. Previous fuel pump systems were not safe enough. For example, in system with paper recharges, there may be use of false coupons that are very same to the original one. Again, we do not have the actual calculations or the extent of CNG that is distribute on daily or monthly process neither how many paper recharge are circulating.

The main purpose of this projects to give the validity to the customer and automatically control the filling and Stopping of the tank valve in a manner with the amount requested.

II. LITERATURE SURVEY

Prof.J.N.Nandimath,VarshaAlekar, Sayali Joshi,Sonal Bhite Pradnya Chaudhari,proposed to implemented an IOT fuel monitoring and tracking system. They use the reed switch which works according to the principle of Hall Effect for sensing the amount of fuel filled in the vehicle. So as agent used to starts filling petrol in his bike/car, the flow sensor is activated. This flow sensor will be active till flow ends. Once flow ends it will calculate the amount of fuel filled and directly notify on his mobile phone. If the phone is not available then it will store this data on cloud [1].

According to prospective of Mr.Rohit K1, Mr.Santhosh K P2, Mr.Jagadeesh V3, Mr. Bose Babu V M4, Asst. Prof.Pragati P5,the present system, petrol pump are operated manually so more man power is required and it is time consuming process. So they proposed a system in order to make easier, reliable and secure which is the fuel dispensing pump that is done automatically using GSM

and RFID. In this system, all drivers have a smart card called RFID card which can be recharged by some points. The petrol pump is equipped with a smart card reader which reads the amount in the card and will display it on the LCD[2].

Aishwarya Jadhav, LajariPatil, Leena Patil, A. D. Sonawane recommended system which is capable of automatically deducting the amount of petrol dispensed from user card based on RFID technology. Liquid dispensing systems are quite commonly found in our daily life in different places like offices, Bus stands, Railway stations, Petrol pumps. Here they are going to present modern era petrol dispensing system which is meant to be operated with prepaid card using RFID technology. The project mainly aims in designing a prepaid card for petrol bunk system and also petrol dispensing system using RFID technology. The customer self-going to avail the service has to done the payment by electronic clearing system.[3].

Naveen kumar P, Kumaresan P and BabuSundaresan Y, proposed that, it deals with automation of fuel station retail outlet; this system will give the sales and stock report to the owner for every hour. The main problem is customer complaints about less quantity of fuel is issued or filled for money given and customers get diverted their attention by operators and refill the fuel without they resetting the nozzle. Nowadays to overcome these problems they replaced some electronic and computerized fuel dispensers but there is no way to identify inside the rotary valve adjustments by fitter[4].

III. METHODOLOGY

The basic methodology of this system is given as follows:

- To provide real time fuel Dispensing using Internet Of Things which is connected to the Microcontroller and Wi-Fi module
- This Fuel dispensing is sequentially added to the microcontroller and Wi-Fi module on the laptop and the data is stored on the cloud.
- To provide real time feature of fuel dispensing, the RFID card is scanned over the RFID module antenna which is connected to the Microcontroller. The data which is send to the cloud is stored for the future use. This process run in continuation automatically using Wi-Fi module.

IV. SYSTEM DESIGN

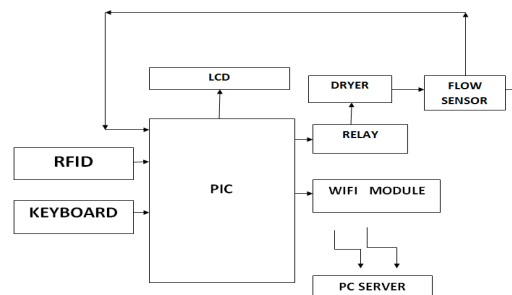


Fig. 1: Block diagram of IOT Based Fuel Dispensing

This Fuel dispensing consist of the Microcontroller, RFID and Wi-Fi module.

Therefore for working of whole system following components required:

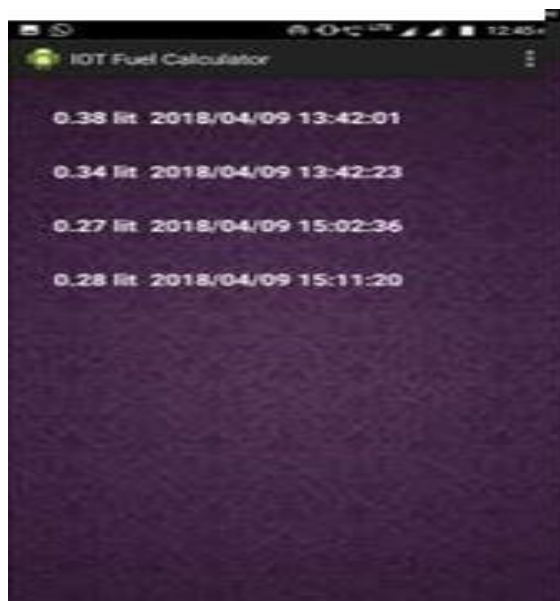
- Power Supply
- Microcontroller
- Flow sensor
- Dryer
- LCD
- Keypad
- Cell phone

Initially the power supply of 12V is required which is used to run the whole circuit. We used step down transformer to avail the 12V. As the microcontroller required 5V to run and Wi-Fi module requires 3.3V.

As the agent comes to fill the fuel in his car, prior he has to swipe his RFID card and enter the digit through the keypad of how amount of fuel is required. After this the microcontroller gets operated it will calculate the data of the user over the cloud. Later the relay gets operated serially to the flow sensor. This flow sensor will be active till flow ends. The dryer is used here to create the pressure over the compressed natural gas used here as the fuel. Once the flow begin, application will start reading pulses, as soon as the fuel is dispensed the flow will get ends and it will calculate the amplitude of fuel inserted and turn it into litres. Further this data is send to the WIFI module EPS8266. Later this data is send over the cloud and get stored. Simultaneously the user gets notification over this mobile of how much amount of fuel is dispensed and the balance left in his card. This system also propagates that to track the location from where the user used to fill the fuel and the quantity.

V. RESULT

This result implies to tell us that the amount of fuel dispensed date time. The unit is controlled through website by using microcontroller. The real time fuel dispensing is done by RFID card and flow sensor.. The data of fuel dispensed is collected by microcontroller and sent over cloud through Wi-Fi. Also, Microcontroller is monitoring the data of the fuel and sending it to the website through Wi-Fi. The result obtained are also send to the user on his mobile.



VI. CONCLUSION

The well-known system will assure that how much quantity of fuel is exactly distributed to prevent loss of magnitude of cash. System implementation will be done by effective flow sensor and mobile, we can get desire mileage. We can verify how much fuel is distributed and instantly we get the notification.

REFERENCES

- [1] Mayur Gawade, Sandesh Gawde, Sonal Kanade, "A review paper on Automated Fuel Pump Security System", International Journal on Recent and Innovation Trends in Computing and Communication, Vol. 3, Issue: 11, Page No.: 6156 – 6158, [November 2015.]
- [2]Aniket H Jadhav, Rajan S Pawar, Priyanka M Pathare,Kishore D Pawar, PrafullaPatil, , "Multi-Atomized Fuel Pump with Use Security", International Journal of Scientific & Technology Research, Vol.3, Issue5, ISSN 2277- 8616 , [May2014]
- [3]Behera Susanta K, Ali Farida A, "Automatic0 fuel pump control system using embedded system",International Journal of Computer Technology and Electronic Engineering),[April 2013]
- [4]Ahmed, A. A., " Fuel Management System." ,International Conference on Communication, Control, Computing and Electronics Engineering (ICCCCEE), Khartoum, Sudan, 7. [2017]
- [5]elmonem, S. A., "Design of Bus Tracking and Fuel Monitoring System". ,International Conference on Communication,Control, Computing and Electronics Engineering (ICCCCEE), Khartoum, Sudan, 5.[2017]
- [6]Peter Adole, Joseph M. Mom, Gabriel A. Igweue, " RFID Based Security Access Control system with GSM technology" ,American journal of Engineering Vol.5, Issue-7, pp-236-242.
- [7]Fawzi M. Al-Naima, Mohammad M. Hasan, " Design and Implementation of RFID based fuel dispensing system" ,International Journal of Computing and Network Technology, ISSN 2210-1519,[June 2015]
- [8]Sahana S Rao, V Siddeshwara Prasad, "Centralized automation of petrol bunk management and safety using RFID and GSM Technology", Control system with GSM technology, American journal of Engineering,[2017]
- [9]Srinivasan, H. Ranganathan, S. Vani, "An embedded system and RFID solution for transport related issues" , 2nd International Conference on Computer and Automation Engineering, Vol-1, Page No.:298-302,[2010]
- [10]Whai-De Chen, Hsuan-puchang, "Using RFIDTechnology to Develop Attendance System and Avoid traffic Congestion around Kindergartens", First IEEEInternational Conference on Ubi-Media Computing, IEEE: ISAN No: 10090182, Page.No.568-572,31st [July2008.]
- [11]Divya.D, K. Sathiyasekar, "Modern real time electric meter for efficient energy management using Markov chain algorithm",International conference on advanced communication control and computing technologies IEEE: ISAN. No:16620755, Page No.:473-476,[May2016.]
- [12]Aniket H Jadhav, Rajan S Pawar, Priyanka M Pathare,Kishore D Pawar, PrafullaPatil, "Multi-Atomized FuelPump with Use Security", International Journal of Scientific & Technology Research, Vol.3, Issue5, ISSN 2277- 8616,[May2014]
- [13]Kumar Naveen P., Kumaresan P.,Babu Sundaresan Babu Y, " IoT based retail automation of fuel station and alert system", Intelligent systems, Volume 17, pp. 84-87[2017]
- [14]Gupta Punit, Patodiya Sawan, Singh Digvijay, Chhabra Jasmeet, Shukla Achman , " IoT based smart petrol pump, Parallel, Distributed and Grid Computing,"[2016]
- [15]Shanthan Hubert J.B., Dr. Arockiam L., Kumar Vinoth Dalvin A., " Filling Fuel Quantity Measurement Systems Using Internet of Things", International Journal of Innovative Research and Advanced Studies, Volume 3 (13), pp. 152-154[2016]
- [16]Gaikwad A. Priyanka, Wanare S. Shubhangi, Sonone S. Pallavi, Bahekar K. Pratibha ,Prof. Sheikh Y. I. , " Automation in Petrol Bunk using RFID and GSM" , International Journal of Research in Advent Technology, E- ISSN: 2321-9637, pp. 177-180,[2017]
- [17]Vural, B. " Fuel Consumption Comparison of Different Battery/Ultracapacitor Hybridization Topologies for Fuel-Cell Vehicles on a Test Bench", IEEE Journal of Emerging and Selected Topics in Power Electronics, vol. 2, No. 3, September 2014, 12.[2015]
- [18]Vinay Divakar, "Fuel Guage Sensing Technologies For Automotive Applications", IJAR CET, volume 3 issue 1,[January 2014].
- [19]Jaimon Chacko Varghese, Binesh Ellurayil

- Balchandran, “Low Cost Intelligent Real Time Fuel Mileage Indicator For Motorbikes”, IJITEE, ISSN: 2278-3075, volume-2, issue-5. [April 2013]
- [20]Deep gupta, Brajesh kr. Singh and Kuldeep panwar, “A Prototyping Model For Fuel Level detector And Optimiser”, African journal of basic & applied sciences 4 (6): 226- 229, ISSN 2079-2034,[2012]
- [21]Christo Ananth, G.Poncelina, M.Poolammal, S.Priyanka, M.Rakshana, Praghash.K., “GSM Based AMR”, International Journal of Advanced Research in Biology, Ecology, Science and Technology (IJARBEST),Volume 1,Issue 4 , pp:26-28 ,[July 2015]
- [22]Kapse Sagar Sudhakar, Abhale Amol Anil, Kudake chetan Ashok,Shirsath Shravan Bhaskar, “Automatic Street Light Control System”,International Journal of Emerging Technology and Advanced Engineering,Volume 3, Issue 5, [May 2013]
- [23] Behera Susanta K., Ali Farida A. “Automobile Fuel Pump Control System Using Embedded System”,International Journal Of Computer Technology & Electronic Engg.,Volume 3 (Issue 2), Page No. 41-47. [April 2013]
- [24]D. Bandyopadhyay and J. Sen, “Internet of things: Applications and challenges in technology and standardization,” Wirel. Pers. Commun., vol. 58, no. 1, pp. 49–69, [2011]
- [25]M. Abu-Elkheir, M. Hayajneh, and N. A. Ali, “Data management for the Internet of Things: Design primitives and solution,” Sensors (Switzerland), vol. 13, no. 11, pp. 15582–15612, [2013]