

Automatic Ration Distribution System Using RFID Technology

Abinaya P¹, Alamelu P², Benita S³, Karthikeyan A⁴ and Kavitha K⁵

^{1,2,3,4}Final year ECE students, Velalar College of Engineering and Technology, Erode, Tamilnadu, India.

⁵Assistant Professor, Velalar College of Engineering and Technology, Erode, Tamilnadu, India.

Article Received: 01 March 2018

Article Accepted: 09 April 2018

Article Published: 28 April 2018

ABSTRACT

RFID based automatic ration distribution system is an approach in public distribution system useful for more efficient, accurate and automatic technique of ration distribution. The present ration distribution system has drawbacks like inaccurate measurement of goods, low processing speed, large waiting time and material theft. In this paper proposed system is based on RFID and the proposed system replaces the manual work in ration shop. To get materials in shop need to show the RFID tag to the RFID card reader, then the controller checks the customer's codes and details in the respective cards. After verification, customer need to select material and quantity using QR-code sensor. After delivering the required material to customer, the microcontroller sends the information to the customer as well as Public Distribution System authorities.

KEYWORDS: RFID, Public distribution system, microcontroller.

1. INTRODUCTION

The ration distribution system is one of the largest government policies in India. The main objective is to provide food grains (wheat, rice, sugar, kerosene etc.). The distribution of ration is controlled by central government along with state government. The government issues different distinctive ration cards like yellow ration cards, saffron ration cards and white ration cards depending on family annual income. Public distribution system is one of the widely controversial issues that involve malpractice. The manual intervention in weighing of the material leads to inaccurate measurements or it may happen, the dealer may not provide sufficient amount of food grains to customers. Most of the time people are not aware of availability of ration in ration shop. The dealer may sell ration at higher price than recommended by the government, in this way, we are facing problem of corruption in public distribution system. The proposed system aids to control malpractices which are present in ration shop by replacing manual work with automatic system based RFID. The ration distribution system is automated by using ATMEGA328. The RFID card has unique identification number. The consumer scans the card on RFID reader. Once consumer is validated by password, the system asks the customer to select the material and quantity of material using QR code sensor. Based on the selection, appropriate circuit will be activated and customer get the materials. The proposed system would bring transparency in public distribution system and become helpful to prevent malpractice.

2. LITERATURE SURVEY

The most of the people having ration cards to buy the materials from the ration shops. The customers have to go to the ration shop and ask employee to give the commodities and the amount he needs and the employee manually measure it and give to the customers. The existing method has two drawbacks, first one is weight of the material is weighed with the help of humans and secondly, if not buy the materials at the end of the month, they will sell to others without any intimation to the government and customers. This leads to corruption, selling the materials in black market and theft and the processing speed is low. This system is completely manual and hence the probability of misplacing the document is more and delay in notification. It is less secured and consumes more time. Because

of this we have proposed an automatic ration distribution system based on RFID technology to overcome it . The below diagrams fig 1&2 will illustrate this process.



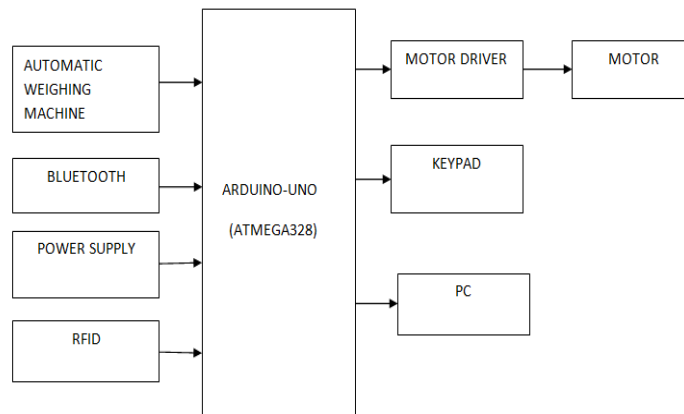
Fig 1:Digital Table Top weighing Scale



Fig 2:Manual Ration Distribution System

2.1. PROPOSED METHOD

Block diagram



The block diagram consisted of microcontroller, ATMEGA 328, load cell, RFID, motor driver, motor and personal computer. RFID and Bluetooth, load cell are act as input to the system and pc is used for displaying. The microcontroller outputs are used to drive motor and valve.

2.1.1. POWER SUPPLY

The power supply is the most important for electronic circuits, which is used to provide the required power to the controller and other electronic devices.

2.1.2 ARDUINO CONTROLLER

It is an open source platform based on easy to use hardware and software. Because of this board it is easy to read input and output. It requires low supply and has 32kb flash memory for storing program.



Fig 3:Arduino Controller

2.1.3. KEYPAD

Keypad is basically used to enter the password and to select the quantities of the product that are allotted to the person and it is given as input to the system.

2.1.4. RFID READER

RFID stands for Radio-Frequency Identification. RFID consists of a antenna, transceiver and transponder electronically programmed with unique information. RFID based access control system authorized or responsible persons to get the material from the ration shop When a user swipes a RFID card and provides a password to a system, it is a smart card reader which detects and reads RFID tag and forwards the details to the interfaced microcontroller module for the further processing. RFID is automatic detection method, relying on storing and remotely retrieving data using device called RFID tags. An RFID tag is an object that used for the purpose of identification and tracking using radio waves. The following figure will show the RFID Cards.



Fig 4: RFID Cards

2.1.5. HOW RFID WORKS

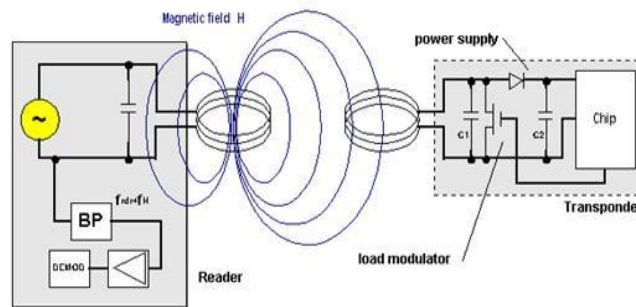


Fig 5: RFID Working Mechanism

3. DC MOTOR WITH DRIVER CIRCUIT

Interfacing of DC motor and LPC2148 using L293D IC, IC L293D provides proper matching between motor and LPC2148.

4. FEATURES

1. high torque 12V geared motor 10RPM
2. Shaft length 15mm
3. No load current 800mA, load current up to 7.5A

The following figure will show the DC motor with driver



Fig 6: Motor driver

5. QR –CODE SENSOR

It is fast readability and large storage capacity then barcodes and camera act as sensor devices. In this paper it is used to select the quantity of the materials and security is high than barcodes



Fig 7: QR code Scanner

6. LOAD CELL

It is a transducer that used to create an electrical signal and it works on the principle of a planar resistor. It has a very good resonance value. In this paper load cell is used as automatic weighing machine. On selecting the product the load cell will automatically weigh the product and dispatch the required product .



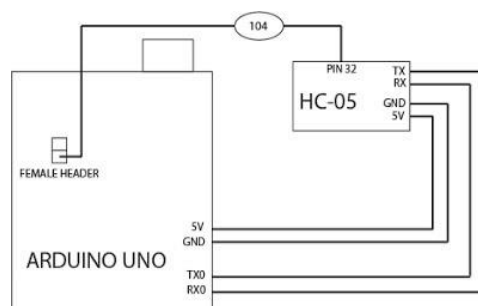
Fig 8: Load Cell

7. HC05 BLUETOOTH

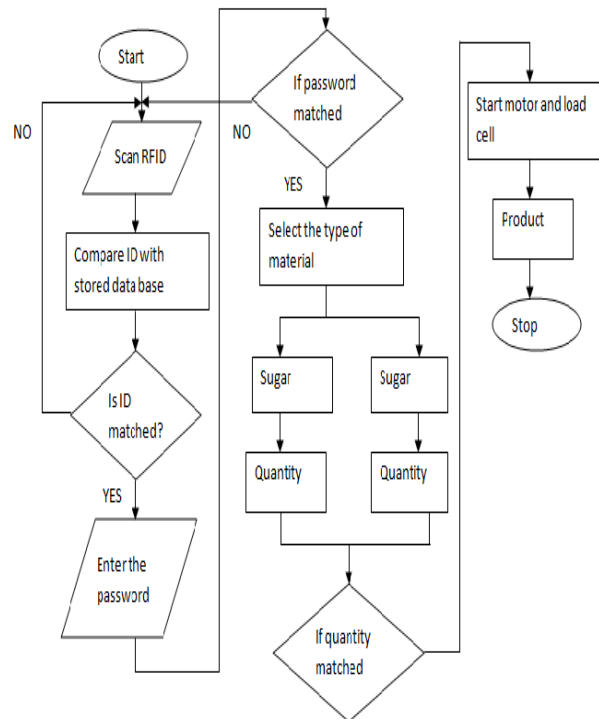
HC05 Bluetooth is an easy to use Bluetooth SPP (Serial Port Protocol) module, designed for transparent wireless serial connection setup. Bluetooth is connected with arduino. in this paper , it is used to transmit and receive the information.



Fig 9: Bluetooth



8. FLOW CHART



9. RESULT

The automatic ration distribution system is used to distribute the solid or liquid materials in ration shop very efficiently and accurately and it increases the process speed in ration shop. When customer show the RFID card to reader it will get the data and verify with stored data base and ask them to enter the password. After verifying the password, the data and the products available to them will be displayed in the personal computer. By using camera we can scan the QR-code which is used to select the required quantity of the product. The motor drive act as interface between motor and arduino and is used to drive the motor. The motor mechanism to dispense the selected quantity after that the motor stops and message will be transmitted to user and government.

9.1 Advantages

1. Very accurate and reduces paper work.
2. Reduces material theft at ration shop.
3. Eliminating man power.
4. It uses advanced memory chip technology to track and protect the database of the user
5. It reduces many terms like illegal usage, hijacking of ration cards, over crowd.

9.2. Application

1. Automation of PDS and digitalized it.
2. Also used in

3. Milk dispensing system
4. Water distribution system

10. FUTURE ENHANCEMENT

It can be implemented using GPRS which we will be able to access the data base even outside the home town. When it is interfaced with GSM microcontroller sends the information in the form of SMS to the related people.

11. CONCLUSION

In this paper, we can provide a safe, secure and efficient way of public distribution system. By using this technique Microcontroller based automated ration shop, it solves the drawbacks of existing methods in public distribution system. It eliminates the inaccurate measurement of materials due to human mistakes and it also eliminates the process of selling the products in black market. This new technology gives solution and this research work will make a great change in public distribution system and provides benefit to the government by avoiding the corruption. Using this modern system we can have better management of the ration distribution.

REFERENCES

- [1] Vinayak T., shekar, Mahadev S. Patil RFID and GSM based automatic rationing system using LPC2148 International journal of advanced research in computer engineering and technology (IJARCET) volume 4 issue 6, June 2015
- [2] Besil issac , alwin james , vijethraj S. V. Jane preema salis , sathisha.K, automation of ration cars using RFIS and GSM technique ,International journal of Internet of things .2017.
- [3] SriHarsha Vardhan, Naveen Sivadasan, Ashudep Dutta QR code based chipless RFID system for Unique identification International Conference on RFID Technology and its applications 2016.
- [4] S.Sukumaran ,K.Gopinath, S.Kalpanadevi, P. Naveen kumar Automatic Rationing System using Embedded Technology, International Journal of Innovative Research in Electrical and Electronics Engineering 2013.
- [5] M.S.Manivannan, Dr. P. Kennan, Dr.M.Karthikeyan, International Journal of Research in Science and Engineering.
- [6] Sayala Shinde , Harshada Tagtode, Anita Palle Smart Rationing System by Using GSM and QR-code Imperial Journal of Interdisciplinary Research (IJIR) 2016.
- [7] Manoj Zagare, Gopal bodade, Sandip Borul, Gopal Pendharkar, Automatic Rationing System by using Controller International Journal of Research in Advent Technology (IJRAT) 2016.