RFID Based Ration Material Distributions without Human Intervention

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Abstract: Ration card is very important for every home and used for various field such as family members details, to get gas connection, it act as address proof for various purpose etc.

The Ration materials distribution drawbacks, like inaccurate quantity of goods, low processing speed, large waiting time and material theft in fair price shops.

The proposed automatic ration shop for public distribution system is based on Radio Frequency Identification (RFID) technology that ration replaces conventional cards.

To provide the materials automatically without help of humans

Introduction

The ration distribution system is one of the biggest government's economic policies in India. The main goal is to provide cereals like sugar, kerosene etc... to the people at cheaper rates.

The network of the ration shops is spread all over India. To provide ration to the needy in subsidized rates.

Global system for mobile communication is a globally accepted standard for digital cellular communication.

Literature Survey

Sl. No.	Author/Year	Tittle	Inference
01	Vikram Singh et/2013	Smart Ration Card	Journal of Global Research in Computer Science.
02	Gopukumar/ 2013	Automation in ration shop using PLC	International Journal of Modern Engineering Research.
03	Kumar Chaturvedula/ 2012	RFID Based Embedded System for Vehicle Tracking and Prevention of Road Accidents	International Journal of Engineering Research & Technology (IJERT)
04	R.Raman i ' S. Selvaraju / 2012	Bank Locker security System Based on RFID and GSM Technology	International Journal of Computer Applications (IJCA).
05	Prof. Maruti Limkar /2012	RFID based Bill Generation and Payment through Mobile	International Journal of Computer Science and Network (IJCSN).
06	Venkata Rohit Raj/2011	RFID Based Exam Hall Maintenance system	IJCA Special Issue on Artificial Intelligence Techniques – Novel Approaches & Practical

			Applications
07	Pawan Tripathi/ 2010	A Digital Security system with Door Lock System Using RFID Technology	International Journal of Computer Applications
08			
09			

Existing System

➢ Ration Materials distributed with the help of Humans

➢ Ration Materials distributed are inaccurate.

Disadvantages

➢ Ration Materials are inaccurate.
➢ Loss of time.

Proposed System

➢ The proposed system aids to control malpractices which are present in ration shop by replacing manual work with automatic system based on RFID and GSM.
➢ Every consumer family head provided RFID card which acts as ration card.
GSM interfaced with microcontroller sends information in the form of SMS to related people.

Block Diagram
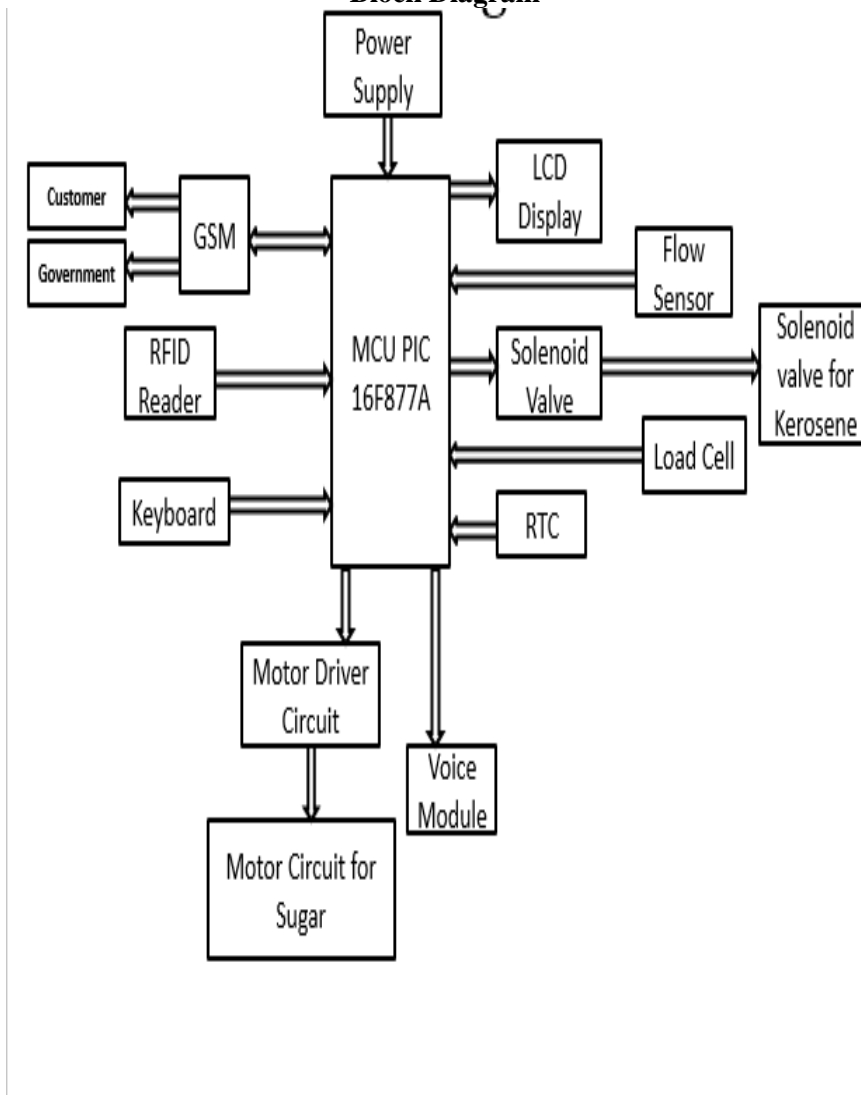
Block Diagram Description

Microcontroller system (MCU):
➢ Microcontroller is the heart of the ration material system.
➢ It is mainly used to interface all the component.
➢ It can be used to dump the coding into it and which makes the kit portable.
➢ There are used various application like remote controls, power tools, toys and other embedded systems.

Radio-frequency identification (RFID):
➢ RFID stands for Radio Frequency Identification.
➢ RFID is small electronic device that consist of a small chip and an antenna.
➢ RFID devices will work within a few feet of the scanner.
➢ RFID Tag acts as a ration card.
➢ RFID tag stores the information and with help of an RFID reader.
➢ The data is captured from the tag and then the information is passed to the PIC Microcontroller.

Global System for Mobile (GSM):
➢ GSM stands for Global System for Mobile.
➢ The GSM used to send the SMS to the customer like purchased item and quantity.
➢ The GSM used to send the SMS to the Government for the Stock Verification.

Power Supply
➢ A power supply is an electronic device that feed electric energy to the electrical device.
➢ The main function of a power supply is to switch one form of electrical energy to another and, as a result this is used to supply power to the ration distribution kit.
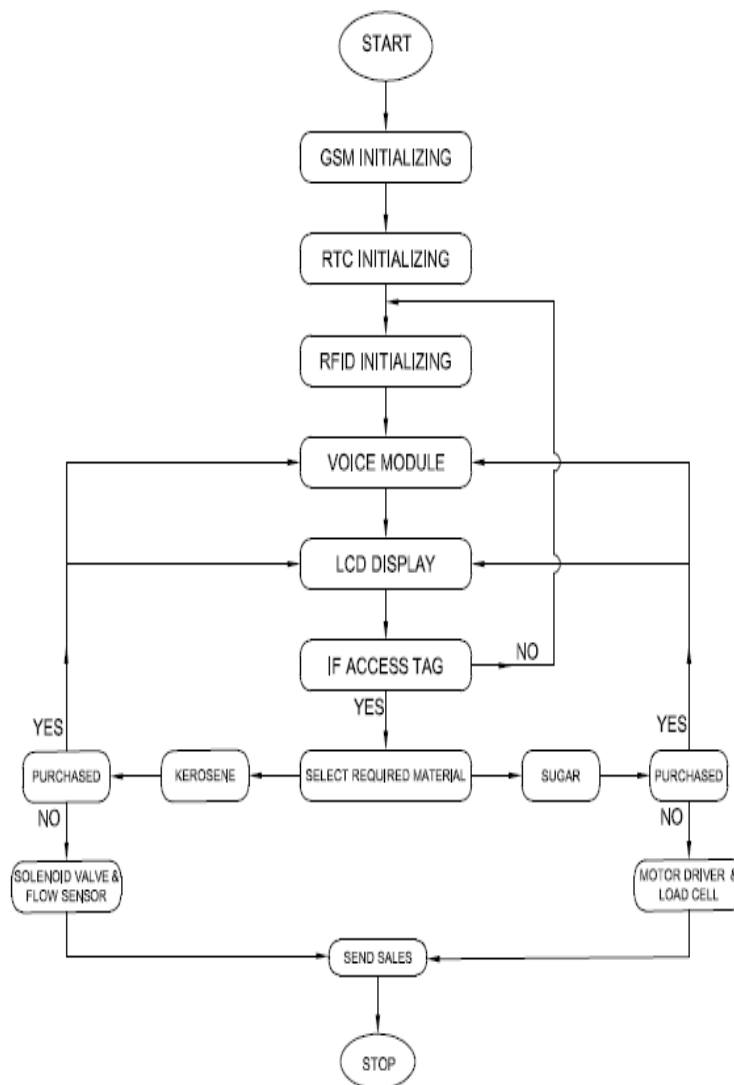
Solenoid valve:
➢ A solenoid valve is an electrically operated valve.
➢ The valve is controlled by an electric current through a solenoid.
➢ A solenoid valve two opening one for input and other for the output.
➢ When the quantity is entered the valve opens and after delivering the desired item the valve closes automatically.

Flow Sensor:
➢ The water flow sensor consists of a plastic valve body, a water rotor and a hall-effect sensor. When the water flows through the rotor, rotor rolls and the speed of it changes with a different rate of flow. The hall-effect sensor outputs the corresponding pulse signal.
➢ Connecting the water flow sensor connect the VCC (Red) and GND (Black) wires of the water flow Sensor to the 5v and Gnd, and link Pulse Output (Yellow) wire of the water flow sensor to digital pin 2. Note that the water flow sensor is not a power-hungry type; it draws a maximum of 15-20mA at 5V DC input.

Flow Diagram

Circuit Diagram

Advantages

➢ Reduces Human Effort
➢ Effective Distribution of ration materials for people
➢ Reduces Corruption.

Hardware & Software Requirements

Hardware Requirement:
- RFID Read
- RFID Card
- GSM Module
- LCD 2x16
- PIC 16F877A
- Load Cell 20 kg
- Flow Sensor
- Solenoid
- Real Time Clock
- Power supply
- PWM Motor
- Keyboard 4x4 Matrix

Software Requirement:
Embedded C

Modules Description

Hardware and software modules must be expos with clear module diagrams.

Result and Discussion

The RFID based Ration Materials Distributions without Human intervention used to distribute or vend the liquid or solid material, which is used for Ration materials distribution in ration shops. Initially everyone will be provided an RFID or smart Card, instead of a ration card. If the customer needs to get any ration material, the user has to show the ration RFID tag card to the RFID reader Kit, the reader that is incorporated with the project kit will recognize the RFID numbers show by the user. Each user will have a unique number, which is not visible to the user.

This recognized RFID number will be given to a microcontroller, which compared the input number with the database. Before starting the system, the unique RFID number of the ration user will be programmed in the controller, such as User name & address details, date of expire of ration card, etc., so that the controller will recognize the data coming from RFID by comparing with the database.

Once the user is identified, the microcontroller will check whether the user has already bought the ration item belongs to that month. If not then, ration items to be dispensed will be displayed on the LCD screen, the user has to feed the comments that which ration item he is going to buy. The micro controller will start the solenoid and motor mechanism to dispense the selected ration item. As the dispensing process is going on simultaneously in the controller will send a command to GSM Modem, to send the text SMS to the user about the ration item, he or she purchased.

Applications

- This proposed system can provide safe, secure, efficient & corruption free public distribution system.
- This type of system can be used for milk dispensing in agriculture also.

Conclusion

In this paper, we have implemented and tested RFID based Ration Materials Distribution without human intervention. But in the existing system having two draw backs, first one is weight of the material may be inaccurate due to human mistakes and secondly, if not buy the materials at end of the month, they will sale to others without any intimation to the government and customers. The above drawbacks rectified by this method. In this system, ration Materials (sugar & kerosene) distributed through automatic mechanism without any help of humans. After receiving the materials, controller sends the information to government office and customer through GSM technology. This system is very accurate, simple and low power consumption, which is used for the real time applications.