

Cashless Automatic Rationing System by using GSM and RFID Technology

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Abstract - Now a day 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 purposes etc. All the people having a ration card to buy the various materials (sugar, rice, oil, kerosene, etc) from the ration shops. But in this 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 the end of the month, they will sale to others without any intimation to the government and customers. In this project, proposed an Automatic Ration Materials Distribution Based on GSM (Global System for Mobile) and RFID (Radio Frequency Identification) technology instead of ration cards. To get the materials in ration shops need to show the RFID tag into the RFID reader, then controller check the customer codes and details of amounts in the card.

After verification, these systems show the amount details. Then customer need to enter they required materials by using keyboard, after receiving materials controller send the information to government office and customer through GSM technology. In this system provides the materials automatically without help of humans.

Key Words: GSM, RFID Reader, LCD Display, buzzer, Keypad

1. INTRODUCTION

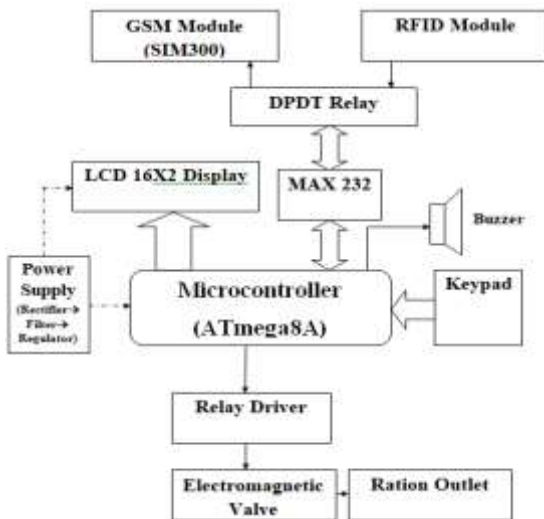
The most of the people having a ration card to buy the materials from the ration shops. When get the material from the ratio shop, first need to submit the ration card and they will put the sign in the ration card depends on the materials. Then they will issue the materials through weighting system with help of human. But in this 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 the end of the month, they will sale to others without any intimation to the government and customers. In this project, we have proposed an Automatic Ration Materials Distribution Based on GSM and RFID Technology to avoid the drawbacks. Today we are facing a

number of transport related problems. RFID technology effectively used to solve some of them. RFID is act as ratio card and other purpose such as RC book, insurance details, service details etc. GSM used to communicate the information between the two people or more than two persons to update the information depends on the requirements.

Radio-frequency identification (RFID) based access-control system allows only authorized or responsible persons to get the materials from ration shops. An RFID system consists of an antenna or coil, a transceiver (with decoder) and a transponder (RF tag) electronically programmed with unique information. There are many types of RFID systems available in the market. RFID classified based on their frequency ranges. Some of the most commonly used RFID kits are low-frequency (30-500 kHz), mid-frequency (900 kHz-1500MHz) and high-frequency (2.4-2.5GHz). The passive tags are lighter and less expensive than active tags.

Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is a common European mobile telephone standard for a mobile cellular radio system operating at 900 MHz. In the current work, SIM300 GSM module is used.

2. BLOCK DIAGRAM



2.1 BLOCK DIAGRAM DESCRIPTION

AVR Microcontroller

AVR is a family of microcontrollers developed since 1996 by Atmel, acquired by Microchip Technology in 2016. These are modified Harvard architecture 8-bit RISC single-chip microcontrollers. AVR was one of the first microcontroller families to use on-chip flash memory for program storage, as opposed to one-time programmable ROM, EPROM, or EEPROM used by other microcontrollers at the time. There are number of popular families of microcontrollers which are used in different applications as per their capability and feasibility to perform the desired task, most common of these are 8051, AVR and PIC microcontrollers. This article introduces the AVR family of microcontrollers. AVR was developed in the year 1996 by Atmel Corporation. AVR is an 8-bit microcontroller.

GSM AND RFID CIRCUIT:

RFID stands for Radio-Frequency Identifications. The RFID is small electronic device that consist of a small chip and an antenna. The chip typically is capable of carrying 2,000 bytes of data or less. A significant advantage of RFID devices above the others devices, RFID device does not require to positioned precisely relative to the scanner. The RFID devices will work within a few feet (up to 20 feet for high-frequency devices) of the scanner. The RFID tag used to read information about the customer through RFID Reader. The GSM used to send the SMS to the customer as well as government authorized person for the verification.

LCD Display:

This display contains two internal byte wise resistors, One for the commands (RS=0) and second for character to be displayed (RS=1). It also contains a user programmed RAM area (the character RAM) that can be

programmed to generate any desired character that can form using a dot matrix.

POWER SUPPLY

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

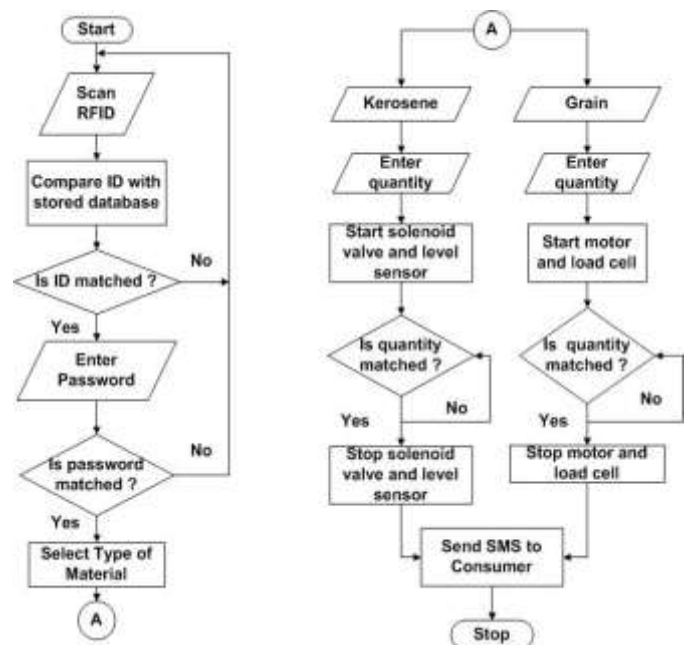
Buzzer:

This buzzer can be used by simply powering it using a DC power supply ranging from 4V to 9V. A simple 9V battery can also be used, but it is recommended to use a regulated +5V or +6V DC supply. The buzzer is normally associated with a switching circuit to turn ON or turn OFF the buzzer at required time and require interval.

Keypad

This 1 x 4 matrix keypad (also known as a membrane keypad) has 4 buttons arranged in a 1 x 4 pattern. Since this keypad has only one row of 4 outputs, no special code or libraries are required to add this to your project, simply treat this as 4 standard buttons. The connector uses a standard pitch (0.100" / 2.54mm) and will fit into our Breakaway Headers

3. FLOW CHART



4. WORKING

Distribution Based on GSM and RFID Technology 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. If the user, select the ration item for purchasing purposes then the controller will calculate the amount of his or her buy and check with the amount available in the RFID card. If he or she has sufficient amount to buy then 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. Before starting the process the amount of the item to be dispensed has to be calibrated separately then the only controller will dispense the correct quantity of ration item selected.

5. CONCLUSION

In this project, we have implemented and tested an Automatic Ration Materials Distribution Based on GSM and RFID technology instead of ration cards. 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, rice, oil, kerosene, etc) 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.

6. REFERENCES

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