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# Review of RFID & GSM Based Automatic Ration Distribution System

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**ABSTRACT:** In this paper we proposed public distribution system i.e. rationing distribution is one of the widely controversial issues that involves corruption and illegal Smuggling of goods. In this paper we provide analysis of used of GSM and RFID in automatic Ration Distribution System The proposed automatic ration shop for public distribution system is based on Radio Frequency Identification (RFID) technology that replaces conventional ration cards. The RFID tags are provided instead of conventional ration cards. Customer's database is stored in microcontroller which is provided by Government Authority. Customer needs to scan tag to RFID reader, and then microcontroller checks customer's details with stored to distribute material in ration shop. After successful verification, customer needs to enter type of material as well as quantity of material using keypad. After delivering proper material to consumer, the microcontroller sends the information to customer as well as PDS authorities using Global System for Mobile (GSM) technology.

**KEYWORDS:** Efficient Communication, GSM, RFID RS-232.

### I. INTRODUCTION

India's Public Distribution System (PDS) is the largest retail system in the world . Public distribution system provides a ration card issued under an order or authority of the State Government for the purchase of essential consumer materials like rice, wheat, kerosene and oil. State Government issues distinctive ration cards like yellow ration card, saffron ration card, and white ration card depending on family annual income. The consumer material is supplied to ration card holders in the first week of every month by ration shopkeeper.

Public Distribution System is one of the widely controversial issues that involve malpractice. The manual intervention in weighing of the materials leads to inaccurate measurements and/or it may happen, the ration shop owner illegally uses consumer materials without prior knowledge of ration card holders. 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 i.e. family head provided RFID card which acts as ration card. The RFID card has unique identification number. The consumer scans the card on RFID reader which is interfaced with microcontroller kept at ration shop. Once consumer is validated by password, the system asks the consumer to select appropriate material and quantity of material through keypad. Based on material chosen by consumer, appropriate circuitry will be activated and consumer gets material. GSM interfaced with microcontroller sends information in the form of SMS to related people. The proposed RFID based automatic ration shop system would bring transparency in public distribution system and become helpful to prevent malpractices.

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## II. BLOCK DIAGRAM AND SPECIFICATIONS

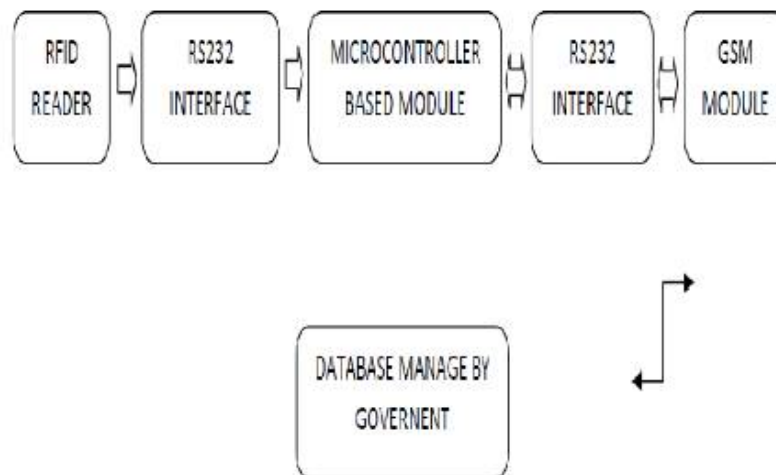


Fig. 1 Block Diagram of the System

### BLOCK SPECIFICATIONS

1. RFID Reader: When a user swipes the smart card, and provides the password (i.e. AADHAR number) to the system, it is a smart card reader (electronic device) which detects and reads the RFID Tag (or smart card) and forward the details to the interfaced microcontroller module for further processing. Specifications of RFID Reader is shown in table 1.
2. RS232: This protocol provides the required interfacing between RFID reader and microcontroller, also the required interfacing between GSM module and microcontroller.
3. GSM Module: It is a device which serves a connection to exchange information/data between automatic rationing system and the central database provided by the Government. Specifications of GSM module is shown in table 2.

Table 1 Specifications of RFID Reader

Parameters	Value
Input voltage	9 to 15 V AC/DC
Data speed (Output)	9600 BPS, 8 bit data, No parity bit, One stop bit
Signal level (Output)	Level define by RS232
Detection Range	25 to 30 cm
Tag indication	By LED and Buzzer



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Table 2 Specifications of GSM Module

Parameters	Value
Data rate	9600 baud CSD
Service Support	GSM data transmission, SMS
Status Indicator	1 LED, Alarm
Antenna Impedance	50
Digital Input/Output	8 TTL outputs, 8 TTL inputs with 10 k pull-down

### III. RFID INTERFACING WITH MICROCONTROLLER

Each transponder tag contains a unique identifier (one of 240 or 1,099,511,627,776 possible combinations) that is read by the RFID Card Reader and transmitted to the host via a simple serial interface. It means no two tags are same. Each tag has different value. This value if read by reader. When the RFID Card Reader is active and a valid RFID transponder tag is placed within range of the activated reader, the unique ID will be transmitted as a 12-bit printable ASCII string serially to the host in the format shown in figure 2.

Table 3 AT Commands for Writing and Sending Messages

AT Commands	Meaning
+CMGS	Send message
+CMSS	Send message from storage
+CMGW	Write message to memory
+CMGD	Delete message
+CNMI	SMS alert
+CMMS	More message to send



Fig. 2 12-bit printable ASCII string

An Example, for a tag with a valid ID of 0F0184F07A, the following ASCII data would be sent 0F0184F07A Same data in HEX bytes can be interpreted as: 0x0A, 0x30, 0x46, 0x30, 0x31, 0x38, 0x34, 0x46, 0x30, 0x37, 0x41, 0x0D.

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All communication is 8 data bits, no parity, 1 stop bit, and least significant bit first (8N1). The baud-rate is configured for 9600 bps, a standard communications speed supported by most any microprocessor or PC, and cannot be changed. The RFID Card Reader initiates all communication. This allows easy access to the serial data stream from any programming language that can open a COM port.

## IV. MODULE WORKING PRINCIPLE

- 1) First to start ranging, 10  $\mu$ s high level input signal is given to trigger pin of the ultrasonic sensor.
- 2) As soon as module is triggered, it automatically sends eight 40 kHz and detect whether there is pulse signal reflected back.
- 3) If signal returns, echo pin will rise i.e. it will become high to certain duration which is equal to the time taken by wave to reach the object and to coming back.
- 4) Test distance = (high level time  $\times$  velocity of sound (340m/s)/ 2

Practically, timing diagram of HC-SR04 module is shown in figure 3 and figure 4.

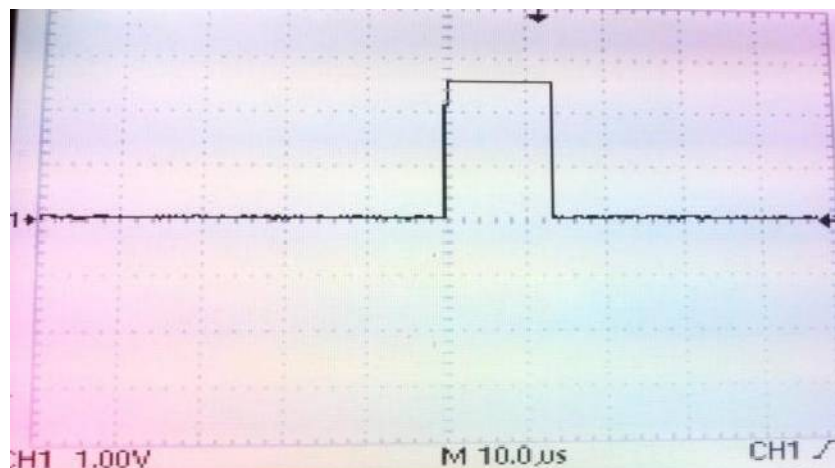


Fig. 3 Triggering pulse

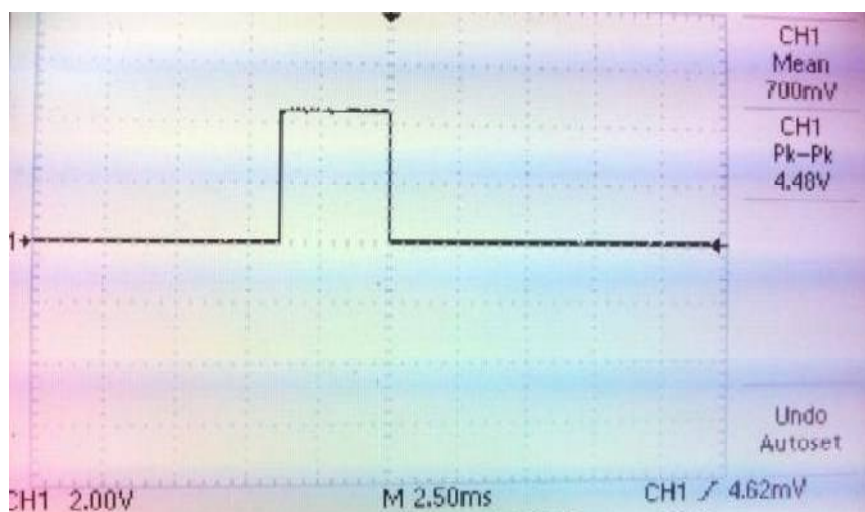


Fig.4 Echo pulse

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## V. RESULT



Fig. 5 Final Working Setup

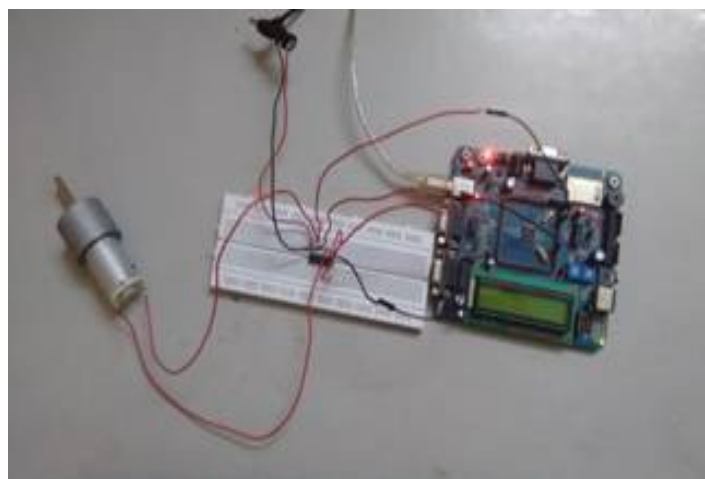


Fig. 6 DC motor interfacing using L293D

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Fig.7 Grain Drawn from System



Fig. 8 Quantity verification using digital weighing machine

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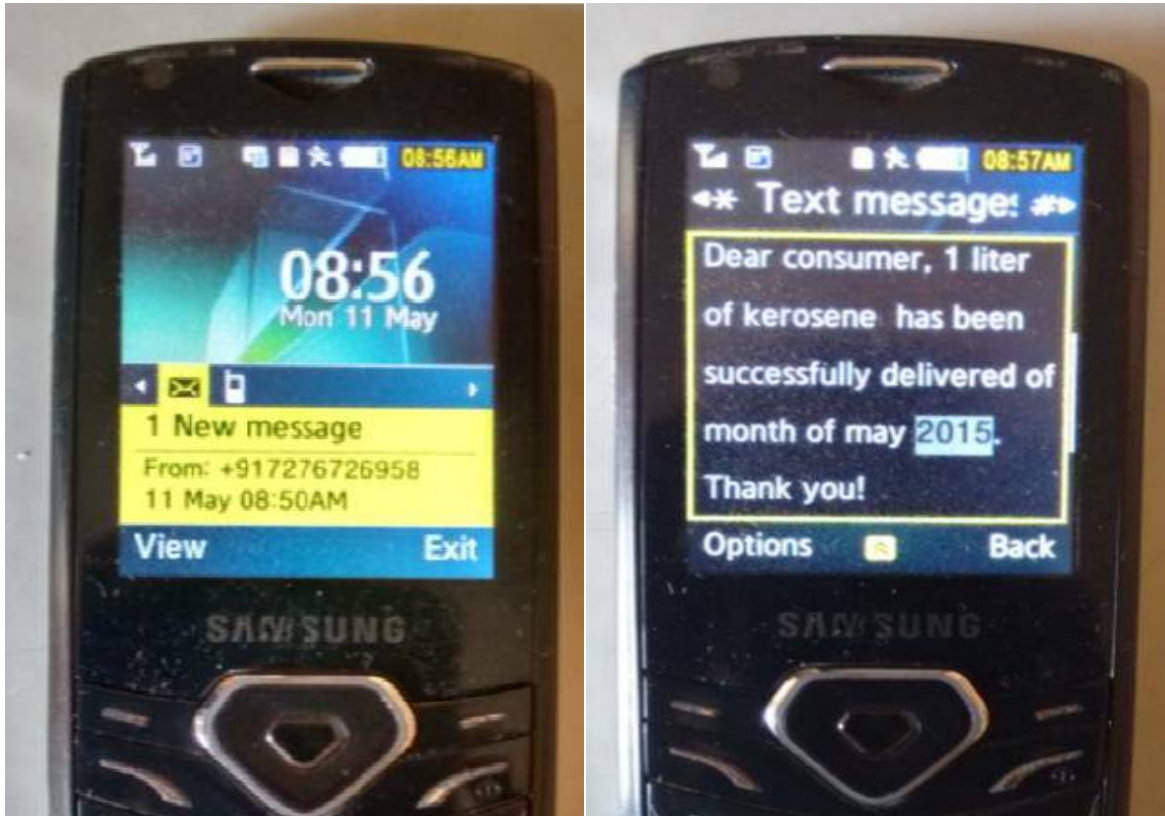


Fig. 9 Consumer received message from ration shop after material delivered from system

### VI.CONCLUSION

. To overcome above problems, automatic ration shop played important role. The automatic ration shop involved RFID as well as GSM technology to distribute the kerosene or grain material. Ration card is replaced by RFID and information is sent to consumer using GSM module. The proposed system creates the transparency in public distribution system as the work becomes automatic. With the help of this system, it is possible to make public distribution system efficient and free from malpractices. The proposed system has advantages like it is helpful to prevent malpractices at ration shop, maintain data properly, reduces paper work, time saving approach and cost effective.

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