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Automatic Rationing System

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Abstract: **This paper proposes the advanced Ration Distribution System, named as "AUTOMATIC RATIONING SYSTEM". Huge amount of Govt. money get wasted due to corruption in the conventional Ration Distribution System. Many of ration materials are not properly provided to the citizens, because the officers were not working properly and the weighing machine does not reset properly. So the ration materials are stolen by others. So we design an "Automatic Rationing System" with Smart card Bio-metric sensor, it is similar to ATM machine. It provides ration materials automatically with proper weight.**

Keywords: **Ration Distribution System, Smart card Bio-metric sensor.**

1. INTRODUCTION

The automatic rationing system, installed at the ration shop which contains three interfaces namely keyboard, billing printer and GSM(Global System for Mobile communication). All these interfaces are interfaced to the advanced microcontroller(PIC16F877A). The person would have to swipe the card on the system placed at ration shop counter. After that for security authentication and to prevent card misuse, the system would ask for the the finger print and password .Detector detects the correct consumer. Once authenticated "Automatic Rationing System" would get updated information regarding the existing subsidies for the current user in the display. The inputs are given by the consumer and select the products by the consumer itself in the keyboard.

The inputs are given to the microcontroller unit, which are given to the products are obtained from our smart ration shop. Further to prevent irregularities in distribution of ration, government can supply various products (like rice, wheat, kerosene, sugar etc.) to rationing shops in the form of sack stored in the container. Central database would be updated immediately after every transaction made by the users.

2. EXISTING SYSTEM

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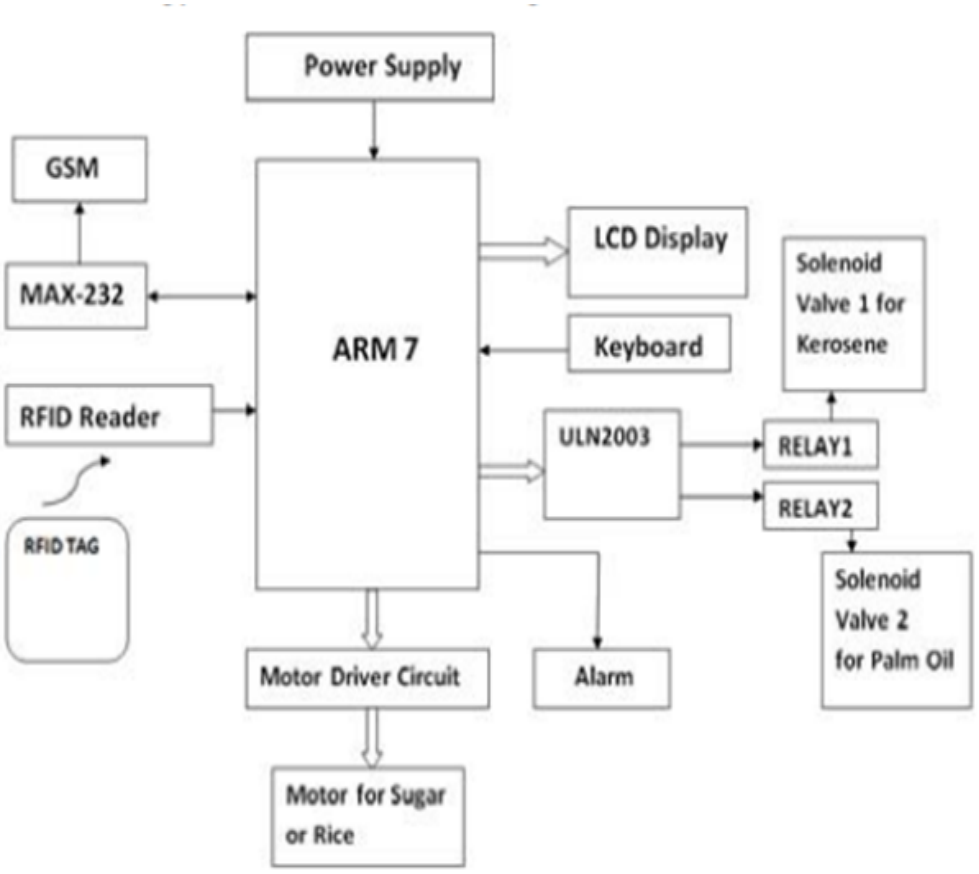
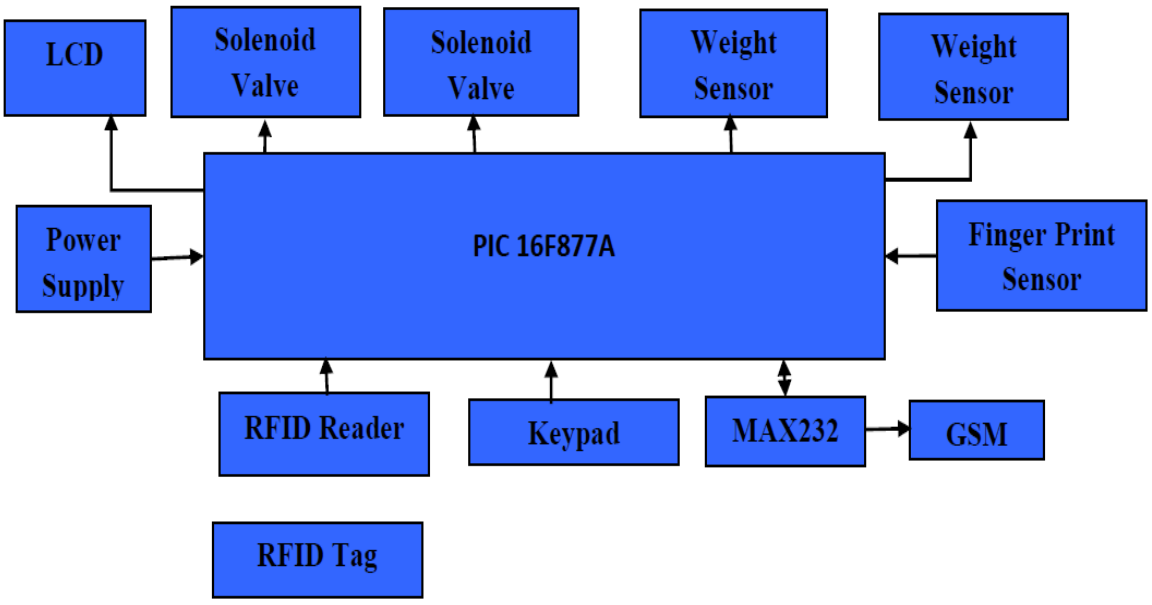
In this system there are no security for user information . If any one get the password ,easily misuseby others only RFID & Keypad for Secured Access,no printer for billing,no end user authentication, prone to cyber crimes, unauthorised person can easily access with password.So in this proposed system we can add a finger print sensor for high security and add the printer for billing to the peoples.

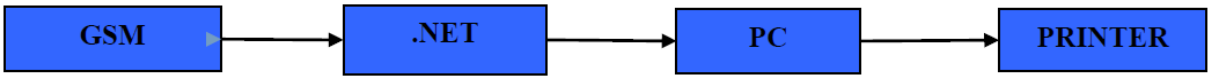


3. PROPOSED SYSTEM

In this proposed system an Automatic Rationing System Based on GSM (Global System for Mobile) Finger print sensor 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 finger print of user ,if it matches 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.

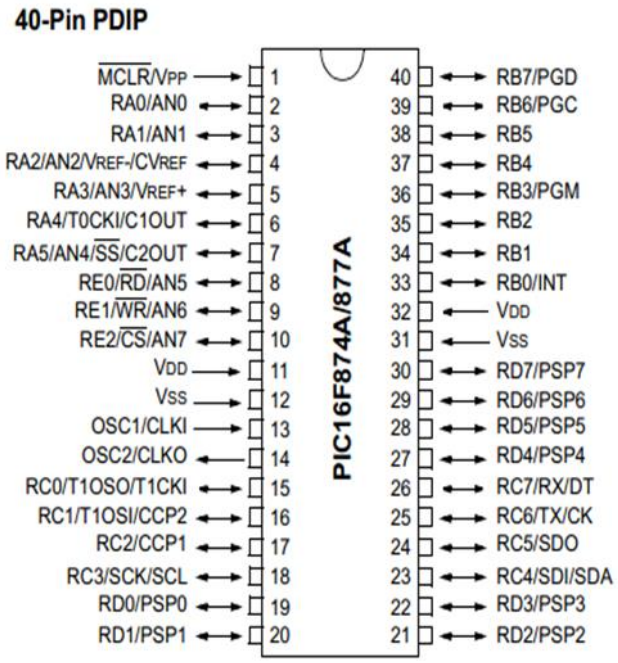


Billing Section:



4. MICROCONTROLLER PIC16F877A

The heart of the system is microcontroller (PIC16F877A) which is a low-power, high-performance, CMOS 8-bit mi-crocontroller. It includes 8kB Flash memory, 256-byte EEPROM, 368-byte RAM, 33 input/out-put (I/O) pins, 10-bit 8-channel analogue-to-digital converter (ADC), three timers, watchdogtimer with its own on-chip crystal oscillator for reliable operation, and synchronous I2C interface.



CMOS Technology:

• Low-power, high-speed Flash/EEPROM technology

• Fully static design

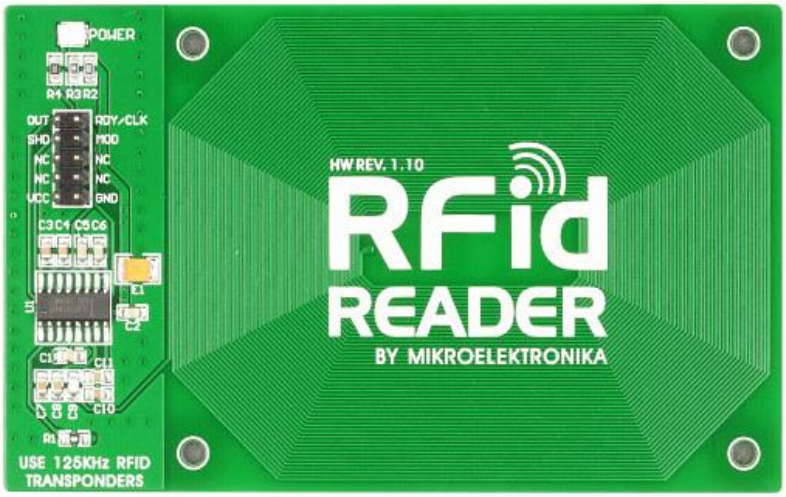
• Wide operating voltage range (2.0V to 5.5V)

• Commercial and Industrial temperature ranges

• Low-power consumption

5. RFID MODULE

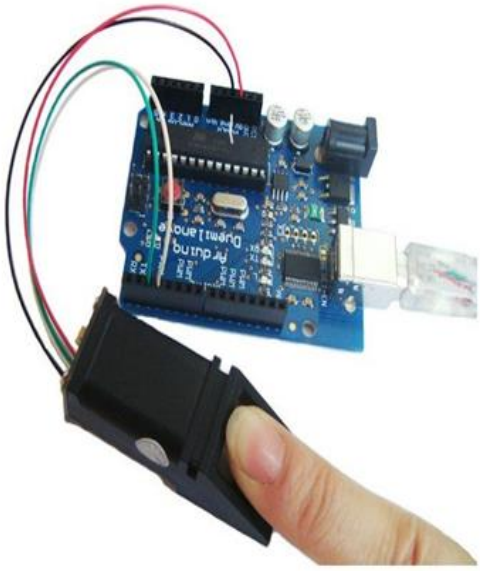
Radio-frequency Identification (RFID) based access-control system allows only authorized persons to get the materials from ration shops. An RFID system consists of an antenna or coil, a transceiver and a transponder electronically programmed with unique information. RFID tags consists of a microchip connected to an antenna, which is constructed of a small coil of wires. Data is stored in the IC and transmitted through the antenna to a reader. Most RFID tags contain at least two parts. One is an integrated circuit for storing and processing information, modulating and demodulating a (RF) signal, and other specialized functions. The second is an antenna for receiving and transmitting the signal. A reader is basically a Radio Frequency (RF) transmitter and receiver, controlled by a microprocessor. The reader, using an attached antenna, captures data from tags, then passes the data to the microprocessor for processing. As the database of the user is stored in the RFID tag, it will be transmitted through antenna to the reader. Reader will access the data and send it to the PIC microcontroller.



6. FINGERPRINT SCANNERS

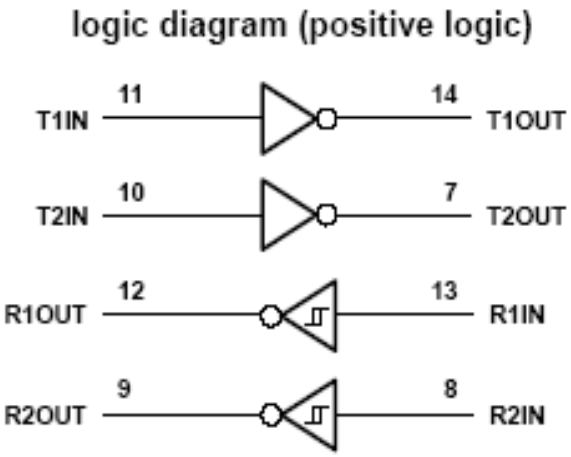
Finger print scanning technology uses a finger print scanner to identify people and provide a high level of security. It is most often used at access points of a building, to ensure that only appropriate people can enter a building or room. Finger scanning technology is now being used to provide security for a wide range of items, including computers. In the computer, finger scanner software is installed to allow the finger print scanner to identify people using the computer and deny access to anyone whose fingerprints do not match those of the people allowed to use the computer.

Finger scanning technology provides a high level of security, as fingerprints cannot be stolen or given to someone else to use. Also, fingerprints are not lost or misplaced. For these reasons, finger scanning is now used for a variety of security purposes. Finger scanner development has lead to the improvement of fingerprint scanning for access reasons and the use of finger scanning for such things as computers, safety boxes, portable finger print scanners, and scanners that may be used by banks or the police.



7. MAX 232

The MAX232 is a dual driver or receiver that includes a capacitive voltage generator to supply RS232 voltage levels from a single 5V supply. Each receiver converts RS232 to 5V TTL/CMOS levels. Each driver converts TLL/CMOS input levels into EIA232 levels. The P3.0 (RX) and P3.1 (TX) pin of controller is connected to the MAX232 driver and the TX and RX pin of MAX232 is connected to the GSM modem or PC.



In this circuit, the microcontroller transmitter pin is connected in the MAX232 T2IN pin which converts input 5V TTL/CMOS level to RS232 level. Then T2OUT pin is connected to receiver pin of 9 pin D type serial connector which is directly connected to PC.

In PC the transmitting data is given to R2IN of MAX232 through transmitting pin of 9 pin D type connector which converts the RS232 level to 5v TTL/CMOS level. The R2OUT pin is connected to receiver pin of the microcontroller. Likewise the data is transmitted and received between the microcontroller and PC or other device vice versa.

8. GSM MODEM

A GSM modem is a wireless modem that works with a GSM wireless network. A wireless modem behaves like a dial-up modem. The main difference between them is that a dial-up modem sends and receives data through a fixed telephone line while a wireless modem sends and receives data through radio waves. The working of GSM modem is based on commands, the commands always start with AT (which means Attention) and finish with a <CR> character. For example, the dialing command is ATD<number>; ATD3314629080; here the dialing command ends with semicolon.

The AT commands are given to the GSM modem with the help of PC or controller. The GSM modem is serially interfaced with the controller with the help of MAX232. Here MAX232 acts as driver which converts TTL levels to the RS232 levels. For serial interface GSM modem requires the signal based on RS232 levels. The T1_OUT and R1_IN pin of MAX232 is connected to the TX and RX pin of GSM modem

9. SOLENOID VALVES

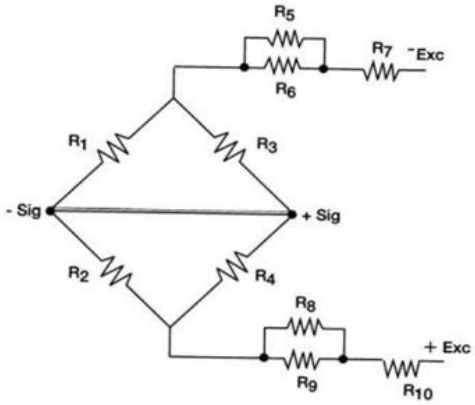
The type of solenoid valve refers to whether that valve is a 2-way, 3-way or 4-way. A 2-way valve has two port connections. A pressure or input port (port 1) and an outlet port (port 2). These valves are used to stop the flow of a fluid or start the flow of a fluid in a piping configuration. Usually, a 2-way valve is referred to as a 2/2 valve, which means the valve has two ports and two positions. The positions are: 1) on or energized and 2) off or de-energized.

Three-way valves are those that have three ports. A pressure or inlet port (port 1), a cylinder port (port 2) and an exhaust port (port 3). A 3-way valve's most common application is for process valve automation. The solenoid valve sends air to a spring return actuator or cylinder, which creates rotational or linear movement to open or close a process valve.In this case, the media is usually compressed air or gas that is creating work, which is where the term "fluid power" is derived. The power of a compressed gas or pressurized liquid is controlled to create mechanical work.

A 3-way valves are usually referred to as 3/2 valves-they have three ports and two positions. Operation is a word used to describe if a valve is normally open (NO), normally closed (NC) or universal (U). NO and NC refers to the state of a 2-way solenoid valve when de-energized or off. NO, NC or U is used to describe the state of a 3-way valve when it is de-energized or off. Below is a table that describes operation modes of 2-way and 3-way valves.

10. LOAD CELL OR WEIGHT SENSOR

The Wheatstone bridge configured below is a simple diagram of a load cell. The resistors marked T1 and T2 represents train gauges that are placed in tension when load is applied to the cell. The resistors marked C1 and C2 represent strain gauges which are placed in compression when load is applied. The +In and -In leads are referred to as the +Excitation (+Exc) and -Excitation (-Exc) leads. The power is applied to the load cell from the weight indicator through these leads. The most common excitation voltages are 10 VDC and 15 VDC depending on the indicator and load cells used. The +Out and -Out leads are referred to as the +Signal (+Sig) and -Signal (-Sig) leads. The signal obtained from the load cell is sent to the signal inputs of the weight indicator to be processed and represented as a weight value on the indicator's digital display.



As weight applied to the load cell, the gauges C1 and C2 compress. The gauge wire becomes shorter and its diameter increases. This decreases the resistances of C1 and C2. Simultaneously, gauges T1 and T2 are stretched. This lengthens and decreased the diameter of T1 and T2, increasing their resistances.

Strain gauge load cell

These changes in resistances cause more current to flow through C1 and C2 and less current to flow through T1 and T2. Now a potential difference is felt between the outputs or signal leads of the load cell. Let's trace the current flow through the load cell. Current is supplied by the indicate through the -In lead. Current flows from -In through C1 and through -Out to the indicator. From the indicator current flows through the +Out lead, through C2 and back to the indicator at +In.

11. RESULTS AND DISCUSSION

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 human beings.

12. CONCLUSION

This proposed method can provide a safe, secure and efficient way of public distribution system. It solves the problem of manual process in public distribution system.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 sending the current stock information to the government database via GSM and reduce the manpower.

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