International Journal of Multidisciplinary Engineering in Current Research - IJMEC
Volume 8, Issue 11, November-2023, http://ijmec.com/, ISSN: 2456-4265

COIN AND RFID BASED WATER DISPENSARY SYSTEM

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Abstract: This abstract presents an efficient traffic priority control system designed to expedite water is essential for life and it is a key driver for sustainable growth and development. Water management is the activity of planning, developing and distributing water resources optimally. It includes management of industrial water, sewage (or) waste water resources, flood protection, irrigation and water table. Water has a great impact in today's life since the quantity of usage is increased because of the population growth and the availability is decreased. This system focuses on the implementation of drinking water ATM to manage water resources efficiently. This presents the description of coin and RFID operated water dispenser. The water dispensing machine dispenses water on the detection of the right coin to activate water ATM machine. Coins used are 1 rupee, 5 rupee or RFID card to access the water. We can provide the top grade pure water in cheap amount to public. With the innovations in this field, we can touch the areas of rural. Also to prevent the health issues, arise by impure water. This show how beneficiary it is for the public.

Keywords **-**8051 microcontroller , resource allocation , Coin sensor, DC motor, vending machine, RFID tag

I. INTRODUCTION

The dispensing mechanism dates back to the 1880s. In London, England, the first coin-operated commercial machine was developed to sell postcards. Compared to traditional methods of payment, vending machines are more convenient and easily accessible. These days, you can find them everywhere—for example, selling tickets at train stations and snack and drink machines in companies and schools. ATMs may be found at many banks, and some even let users purchase platinum and diamond jewelry. Since safe drinking water is a concern in India, we will primarily distribute mineral water in public spaces. With the use of a water control valve, the system's primary goal is to prevent both environmental contamination and water waste. The abbreviation for Radio Frequency Identification is RFID. RFID automatically recognizes and tracks tags attached to items using electromagnetic waves. The tag has information that has been electronically saved. Water ATMs provide the following benefits: clean, safe drinking water is available around-the-clock; the number of water-borne illnesses is decreased; and less plastic bottles are used. This project may be used in real-time applications, including attendance tracking, where the system facilitates the easy and quick recording of an individual's attendance in a matter of seconds. The machine may be operated by a customer using an RFID card and an RFID tag. The customer will be able to choose how much water they wish to drink by using the keypad. The LCD display panel will have all of the information shown. The controller will enable the machine to fill the container with the required amount of water based on the amount filled by the user. Additionally, the device features a coin detector that detects certain coins and communicates valid coin information to the microcontroller. For the purpose of distributing water, the system employs a genuine coin detecting technology to identify legitimate coins. In order to ascertain if the coin was entered or not, the microcontroller now analyzes the data received from the sensor. The system now signals the controller to begin the DC pump, which pores water for the duration specified by the pot, upon detecting genuine coins. Barcode labels gave rise to RFID systems, which are used to automatically identify and track goods and persons. RFID consists of two primary parts: the

DOI: https://doi-ds.org/doilink/11.2023-88287642

transponder and the interrogator (also known as an RFID reader). Wireless communication usually takes place without requiring a line of sight between the RFID reader and tags. Passive tags are used in this project. To read and write data to the tag and to activate it, the antenna sends out radio signals..

II. BLOCK DIAGRAM

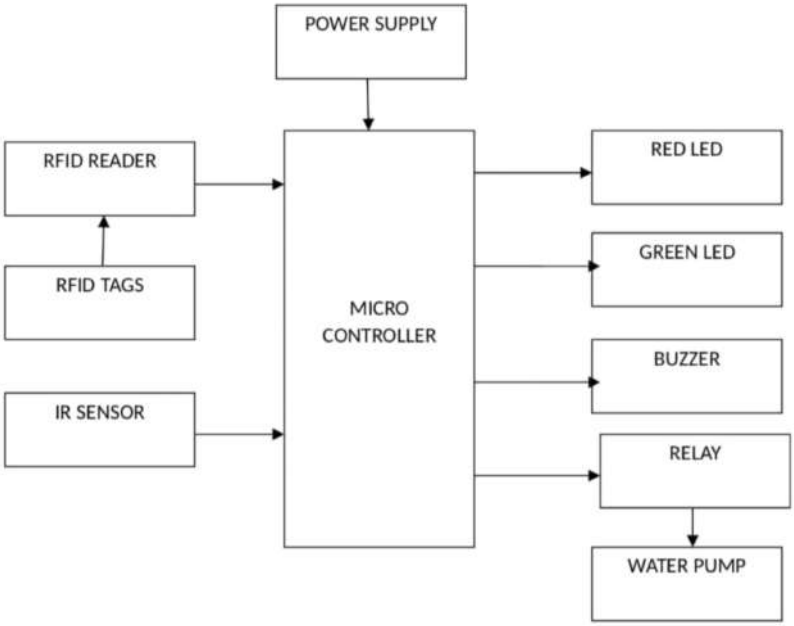

Fig 1: Block Diagram

Designing the necessary power supply is the first stage in developing any system. The majority of our supply circuitry's components only need 5V as an operating voltage, and we don't need more than 300 mA overall from the power supply. Since 230 V is the typical input voltage, a step down transformer is included into the circuit to reduce the voltage. The regulator IC 7805 then uses this 12 V to produce a 5 V output. The ac voltage is changed into the dc voltage by the diode bridge rectifier.

In this paper, we propose a microcontroller-based automated water vending machine that accepts RFID cards and coins. Using a DC pump, the system may dispense water automatically.

A customer who has an RFID card and a machine that reads RFID tags. Users may program their desired water consumption onto the keypad. The LCD panel will display all relevant data. The customer may set the desired amount of water to be dispensed by using the controller, and the machine will dispense that amount.

The system also features a coin detector that is used to sense individual coins and relay information to the microcontroller regarding legitimate coins. The method employs a genuine coin detecting mechanism, which verifies the legitimacy of coins used to purchase water. After receiving data from the sensor, the microcontroller may decide whether or not a coin has been inserted. When a genuine coin is detected, the system transmits a signal to the controller, which in turn activates the DC Pump to flow water for the duration of time set by the pot.

ISSN: 2456-4265

DOI: https://doi-ds.org/doilink/11.2023-88287642

RFID Reader

There are 2 components to an RFID system. One or more transponders, or "Tags," and a reader. RFID systems, which originated from barcode labels, are used for automated goods and person identification and tracking.

Access Control

RFID readers are installed at doors and require visitors to "read" their proximity card (RF tag) before gaining entry.

Contactless-Systems

In-store payments using radio-frequency identification tags. RFIDs are well-suited for use in automated toll collecting systems. Payment information is sent from a tag on a vehicle or a person's possession to a reader installed at a Toll station. After that, the user's account is automatically charged, or the RFID tag's data is updated.

Product Tracking and Inventory Control

Library books, clothing, manufacturing pallets, electrical products, and many more everyday objects may all be tracked and recorded using RFID devices.

III. METHODOLOGY

RFID Reader

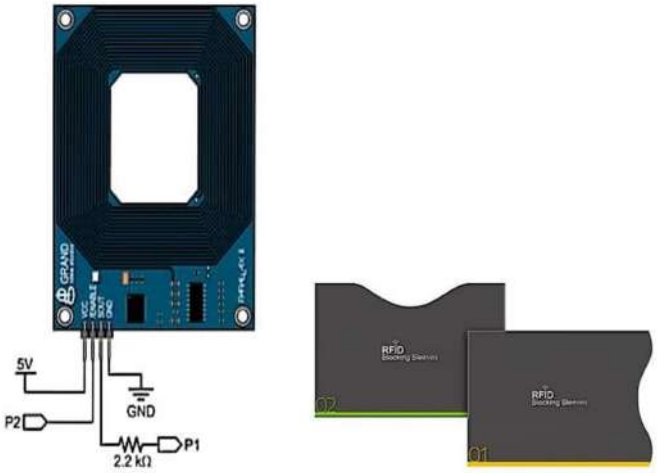

Fig 2: RFID Card

- Radio-frequency identification, or RFID, is a system that uses tags to identify items without needing direct line-of-sight between the reader and the tagged items. All that is required is radio connection between the tag and the reader.
- This module has a built-in antenna and operates at the highly desirable 125 KHz frequency. These inexpensive RFID reader modules are weighted and have serial output, and they are designed to conform to established industrial standards.

ISSN: 2456-4265

DOI: https://doi-ds.org/doilink/11.2023-88287642

Keypad

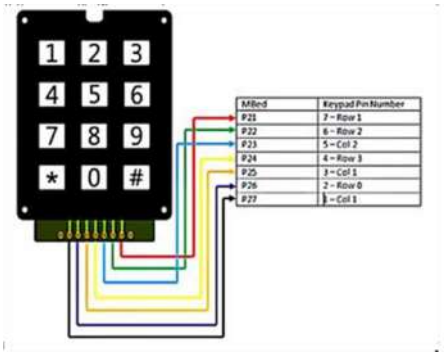

Fig 3: Keypad

Metric keypads are used in a diverse range of embedded applications, such as door lock systems, phones, and as input devices, among others. The use of a metric keypad, as opposed to individual keys, has the potential to decrease the quantity of pins required. The matrix keypad, which is arranged in a 4x3 configuration, consists of a total of 12 buttons. By using 7 microcontroller pins, it is possible to efficiently scan and access all of the buttons on the keypad.

DC Pump

Fig 4: DC Pump

How hydraulic pumps are designed, built, and operate, conceptually and practically. Mechanical energy stored in a fluid or hydraulic pump is transferred to the fluid as it moves through the pump. The pressure and speed of the fluid are indicators of the energy transmitted from the pump to the fluid.

LCD

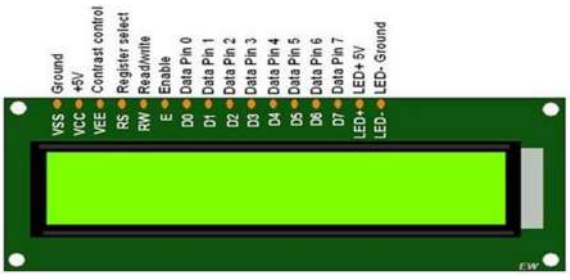

Fig 5: LCD

LCDs employ liquid crystals' light-modulating characteristics to create a flat-panel display or other electronically manipulated optical device. Since liquid crystals cannot generate light on their own, they rely on a backlight or reflector to create colored or black-and-white pictures. LCDs may show anything from random pictures (as on a computer monitor) to static images with little information content that can be toggled on and off, like the existing text, numbers, and seven-segment displays seen on digital clocks. They employ the same fundamental technology, except that arbitrary pictures are built up of a vast number of little pixels, whereas other displays contain bigger parts.

Power Supply

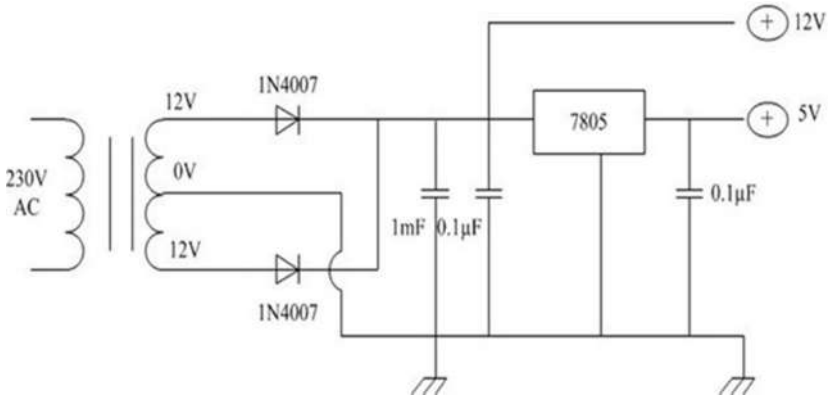

Fig 6: Power Supply

a. This circuit helps transform the mains-supplied alternating current (AC) into a stable, regulated direct current (DC). The transformer, diode bridge rectifier, 7805 linear regulator, and capacitors make up the circuit.
b. The functioning of the circuit may be broken down into two distinct sections. The first stage involves transforming the AC Mains into unregulated DC, and the second stage involves transforming this DC into regulated 5V DC. With that in mind, let's get started talking about the process.
c. At first, a 230V to 12V Step down transformer is used, with its primary wired into the house's electrical system. Bridge rectifier (either a specialized IC or a combination of 2-1N4007 Diodes) is connected to the secondary of the transformer.
d. A 1A fuse is inserted between the transformer and the two diode. As a result, the circuit's current consumption will be capped at 1A. A 1000F Capacitor is used to smooth out the bridge rectifier's rectified DC output.
e. Therefore, 12V DC is being produced across the 1000F Capacitor with no regulation. The 7805 Voltage Regulator IC takes this as an input. The 7805 IC takes this input and turns it to a regulated 5V DC, which may be drawn from its terminals.

ISSN: 2456-4265

DOI: https://doi-ds.org/doilink/11.2023-88287642

IV. IMPLEMENTATION

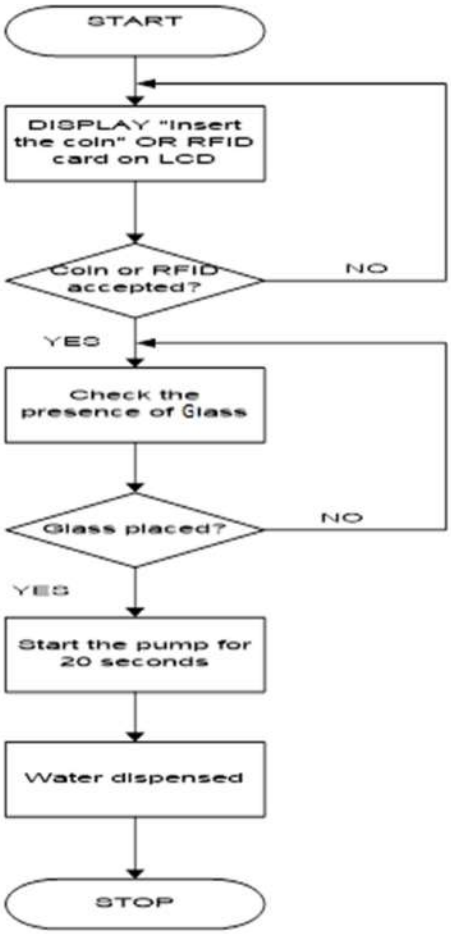

Fig 7: Flow Chart

Both RFID cards and coins are used as inputs in the aforementioned diagram. Coin & RFID operated water dispenser operates on the premise of detecting and distributing water. Microcontroller 8051 is used for the programming of all four interface devices (controller, LCD, water pump, coin sensor). The program runs in a predetermined order. So at start in the flow chart we have began first with the display phrases i.e. Place RFID or Insert currency. A single coin and card acceptor with an RFID card reader. When the right Coin and Card have been put [Yes], the code proceeds to the next step, which is to see whether anything is in the way. If the [glass bottle/container] is not there, the process will go back to the "Start" section. Water will begin to flow from the nozzle/tap when the item [glass, if present] is placed in its path.

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HARDWARE PLATFORM

In order to create a PCB, you may choose from a number of different machines or tools. To build the PCB, however, the authors stuck with the tried-and-true procedure of first sketching the whole circuit on a flat piece of graph paper with carefully measured gaps between the components' legs. After turning the graph paper over, we can see the circuit that will serve as our guide while we write the primary circuitry on the copper plate. Mark the circuitry with thick lines using a marker or pencil, and then immerse the plate in a solution of FeCl3. The PCB should now be drilled at the location where components will be installed. Start soldering the parts when you've finished drilling holes. We may include a jumper for any accidentally cut or undrawn paths. Just to be sure, I checked. This is the tried-and-true method of soldering that has been used for decades. We have sketched the circuit design using the express program on graph paper and then transferred it to a PCB typical copper plate in preparation for soldering.

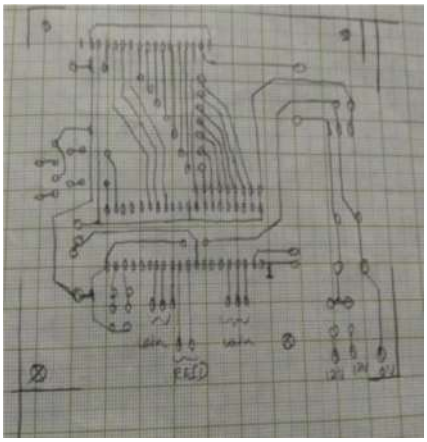

Fig 8: Layout for PCB

V. RESULT

By entering money or using an RFID card, the user should be able to get the needed amount of water. To lower the number of persons who suffer from illnesses that are transmitted via water who are economically disadvantaged and to rid the environment of an excessive amount of plastic bottles.

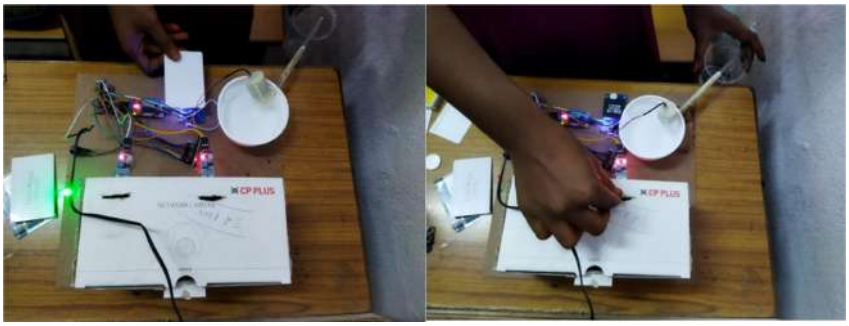

Fig 9 Working Model

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VI. CONCLUSION

In this study, we propose and investigate a water vending system that uses RFID cards and coins as payment methods. It was anticipated that the demand for water is going to increase by fifty percent, and one cannot ignore the fact that India is already experiencing a significant degree of stress. The management of water entails not only the efficient and effective use of existing water but also its conservation. Because only a limited quantity of water will be delivered, the model that has been presented may be utilized to its full potential. Without the need for human labor, there will be less of a chance of water pollution and illnesses transmitted by water.

REFERENCES

[1] Aditi Mohan, Niyati Tiwari, Rajdeep Ghosh, Prof.A.A Shinde, "Coin Operated Water Dispenser".ISO 9001:2008 Certified Journal: IEEE, 2017.

[2] Pasture, M. Krummenacher, F. Robortella, R. Simon-Vermot, and R. Kayal, M. Ecole Polytech. Feb. De Lausanne, A fully integrated solar battery charger circuits and System and TAISA Conference, 2009. NEWCAS-TAISA '09. Joint IEEE North-East Workshop.

[3] B. Arvind Kumar, K. Sowmya, Karne Raghavendra, Mohammed Sajid Hussain, Mohammed Shoaib, Mr. M.Sainath, Design And Analysis On Automatic Disc Braking System, International Journal of Multidisciplinary Engineering in Current Research - IJMEC Volume 8, Issue 6, June-2023, http://ijmec.com/, ISSN: 2456-4265

[4] Anjana S , Sahana M N , Ankith S , K Natarajan , K R Shobha , IEEE ANTS 2015 1570192963Eduardo Garcia Breijo, Luis Gil Sanchez, Javier Ibañez Civera, Alvaro Tormos Ferrando, Gema Prats Boluda,"Thick- Film Multisensor for Determining Water QualityParameters" Proceedings of the IEEE, 2002.

[5] Barth, H. Schaeper, C. Schmidla, T. Nordmann, H. Kiel, M. Van der Broeck, H. Yurdagel, Y. Wieczorek, C. Hecht, F. Saure, D. U., Development of a universal adaptive battery charge As an educational project Power Electronics Specialists Conference, 2008. PESC 2008. IEEE, 15-19 June 2008, Pg 1839-1845

[6] Mr. Mohd Amaan Ali Sayeed, Mr. Mohammed Ghayaasuddin, Mr. Syed Imran, Mr. M.A.Mubeen, An Enhanced Elderly Person Health Parameters Monitoring System With Medicine Prescription, International Journal of Multidisciplinary Engineering in Current Research - IJMEC Volume 8, Issue 7, July-2023, http://ijmec.com/, ISSN: 2456-4265.

[7] Manish Navlakha, Imran, lokendra Singh Rathore, Luvkush Sharma, "Water Vending machine".ISSN:2250-0758, ISSN: 2394-6962, p.p:581-584©2016

[8] Roy Want (2006), "An Introduction to RFID Technology" .IEEE press. Pp.25-33 Pulvirenti, F. Milazzo, P. Ursino, R, Analog and Mixed IC Design, 1997. Proceeding. 1997 2nd IEEE-CAS Region 8 Workshop, 12-13 Sep 1997, Pg. 97 -100

[9] A. Dunkels, B. Gronvall, T. Voigt, "Contiki - a lightweight and flexible operating system for tiny networked sensors" in Local Computer Networks, 2004. 29th Annual IEEE International Conference on,

DOI: https://doi-ds.org/doilink/11.2023-88287642

Nov. 2004, pp. 455-462.

[10] Madhumati R, Reshma sultana, Dharshana R, “Smart water ATM in India using cloud model”. IEEE 2017

DOI: https://doi-ds.org/doilink/11.2023-88287642