



Chief Editor

Dr. A. Singaraj, M.A., M.Phil., Ph.D.

Editor

Mrs.M.Josephin Immaculate Ruba

Editorial Advisors

1. Dr. Yi-Lin Yu, Ph. D
Associate Professor,
Department of Advertising & Public Relations,
Fu Jen Catholic University,
Taipei, Taiwan.
2. Dr.G. Badri Narayanan, PhD,
Research Economist,
Center for Global Trade Analysis,
Purdue University,
West Lafayette,
Indiana, USA.
3. Dr. Gajendra Naidu.J., M.Com, LL.M., M.B.A., PhD. MHRM
Professor & Head,
Faculty of Finance, Botho University,
Gaborone Campus, Botho Education Park,
Kgale, Gaborone, Botswana.
4. Dr. Ahmed Sebihi
Associate Professor
Islamic Culture and Social Sciences (ICSS),
Department of General Education (DGE),
Gulf Medical University (GMU), UAE.
5. Dr. Pradeep Kumar Choudhury,
Assistant Professor,
Institute for Studies in Industrial Development,
An ICSSR Research Institute,
New Delhi- 110070.India.
6. Dr. Sumita Bharat Goyal
Assistant Professor,
Department of Commerce,
Central University of Rajasthan,
Bandar Sindri, Dist-Ajmer,
Rajasthan, India
7. Dr. C. Muniyandi, M.Sc., M. Phil., Ph. D,
Assistant Professor,
Department of Econometrics,
School of Economics,
Madurai Kamaraj University,
Madurai-625021, Tamil Nadu, India.
8. Dr. B. Ravi Kumar,
Assistant Professor
Department of GBEH,
Sree Vidyanikethan Engineering College,
A.Rangampet, Tirupati,
Andhra Pradesh, India
9. Dr. Gyanendra Awasthi, M.Sc., Ph.D., NET
Associate Professor & HOD
Department of Biochemistry,
Dolphin (PG) Institute of Biomedical & Natural Sciences,
Dehradun, Uttarakhand, India.
10. Dr. D.K. Awasthi, M.SC., Ph.D.
Associate Professor
Department of Chemistry, Sri J.N.P.G. College,
Charbagh, Lucknow,
Uttar Pradesh. India

ISSN (Online) : 2455 - 3662

SJIF Impact Factor :5.148

EPRA International Journal of Multidisciplinary Research

Monthly Peer Reviewed & Indexed
International Online Journal

Volume: 5 Issue: 3 March 2019



Published By :EPRA Publishing

CC License





**EPRA International Journal of
Multidisciplinary Research (IJMR) Peer Reviewed Journal**

AUTOMATIC MEDICINE DISPENSER

Harini LN

Department of EEE,
Dr. Mahalingam College of Engineering and
Technology,
Pollachi, India

Nandhini R

Department of EEE,
Dr. Mahalingam College of Engineering and
Technology,
Pollachi, India

Bharath Varun P

Department of EEE,
Dr. Mahalingam College of
Engineering and Technology,
Pollachi, India

Shiny JS

Department of EEE,
Dr. Mahalingam College of Engineering and
Technology,
Pollachi, India

ABSTRACT

Medication can do extend the life and allow people to live independently without the help of others in the Community. However, medication regimes for many people can become complex and overwhelming. Poor medication adherence can erode self-confidence and well-being. Everyone forgets to take their medication at one time or another. But for those on a complex pill regime, not taking prescribed drugs at the right dose and at the right time can have major consequences, particularly if they are elderly or vulnerable. It is necessary to provide medication to the aged in time. Automatic medication dispenser is designed specifically for users who take medications without close professional supervision. It relieves the user of the error-prone tasks of administering wrong medicine at wrong time. The major components of this medication dispenser are a controller, a LCD display, an actuator, an Alarm system, a buzzer, LED and a multiple pill container. The overall operation is to facilitate the user to take the medicines using this kit at required timings. The Alarm system is designed to provide indications by providing a beep sound. The major objective is to keep the device simple and cost efficient. The software used is reliable and stable. Elderly population can benefit from this device as it avoids expensive in-home medical care.

KEYWORDS: *Gsm module, embedded platform, gsm technologies.*

1. INTRODUCTION

Caring of the aged is a serious concern in the developing countries. Family members are responsible for the care and management of the old. In the modern age it is difficult for family members to be available all the time to support the aged.

Today, in our society most families are nuclear. Elderly would prefer to remain independent and their desire for independence is natural, but it is a worry for their children. Sometimes despite their best effort, the aged fail to remember to take their medication on time.

Automatic medicine dispenser is one such approach to help them take their medicines efficiently. As the cost of in-home medical care rises, it has become more and more incumbent among individuals to opt for a device that effectively takes care of their medications. The smart medication system serves the purpose.

The major components of this medication dispenser are a controller, an LED display, a Motor Controller, an Alarm system, a multiple pill container and dispenser. The overall operation is to facilitate the user to set the timings to dispense multiple pills at

required timings. The Alarm system is designed to provide two types of indications – one by lighting an LED and the other by providing a beep sound.

As the people getting busier these days, they tend to forget to take their medicines at prescribed schedule. As a consequence of this Geriatrics are facing unnecessary disposure of themselves into the hospitals. Hence a device or a system is to be designed in such a way that it can dispense the pills at preset time . There has been a need ever since medication was in a pill form for a device that could accurately replace a human being for the need of delivering pills. Humans can determine who to give the pill's to, when and how many and there has not been a pill dispenser to date that has had the capability to replace these three very important aspects. There are many other problems that plague the home pill user, such as someone stealing pills, forgetting to take them or having the pills available to take too many.

(i) Hospitals

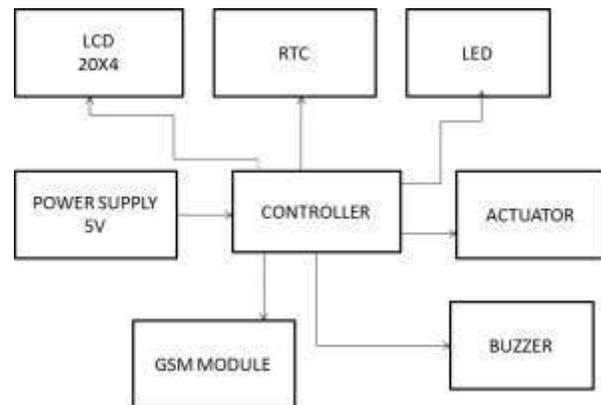
The automatic pill dispenser can simplify pill dispensing for hospitals with small to large capacities. With the presence of a pill dispenser, nurses and doctors can significantly reduce the amount of time for prep work and doing „rounds,‘ this way more attention can be given to patients that are in greater need of medical attention. Medical professionals can also be notified by means of a simple database on whom and when dispensed.

2. BRIEF WORKING

Automatic medicine dispenser is used to help the elder people to take medicines regularly. At the particular programmed time, respective boxes will be opened to take pills. While the box is being opened, a buzzer sound and an LED indication will be given. A GSM module is connected to the kit so that it leaves a message to the particular SIM card as a one another indication to take the medicine. LCD also indicates the medicine has to be taken before meal or after meal.

The controller we are using here is aurdino mega. It is programmed with our need and in accordance with the program, the slots will be opened to take the medicine along with buzzer, LED indication and a message to our mobile phones. The block diagram of the automatic medicine dispenser is shown below.

3. BLOCK DIAGRAM



3.1 Block description

The block consists of the components such as controller, power supply, actuators, LCD, LED, RTC, buzzer and GSM. These all devices are connected to the controller. The controller is programmed with the timing on which the box has to be opened. The main block of the automatic medicine dispenser circuit is the controller.

4. SYSTEM DESCRIPTION

There will be eight slotted pill dispenser box. Every slot contains medicines in respect with the prescription. This slot will be opened automatically in accordance with the time slots we have given.

The time slots have been given using the coding. The coding is dumped in the AURDINO MEGA. Based on the time period we have given in the coding ,the motors will be enabled.

The 230V AC power supply is converted into 5V DC supply using a transformer and 7805 voltage regulator IC.

The motors will be placed in every slots of the pill dispensers box. The slot will be based on the probability of time in which we usually take medicines. For every opening of the slot, there will be indication of a buzzer and also the LED glow.

A LCD display is interfaced with the AURDINO MEGA to display the time and date and also it displays whether we are taking the medicines before meal or after meal in accordance with the time. For example , If we are taking medicines at 9AM, it will be displayed as “Before meal” and if we are taking medicines at 10AM , it will be displayed as “After meal”. The continuous time display in the LCD is due to the real time clock which is interfaced to the AURDINO MEGA .

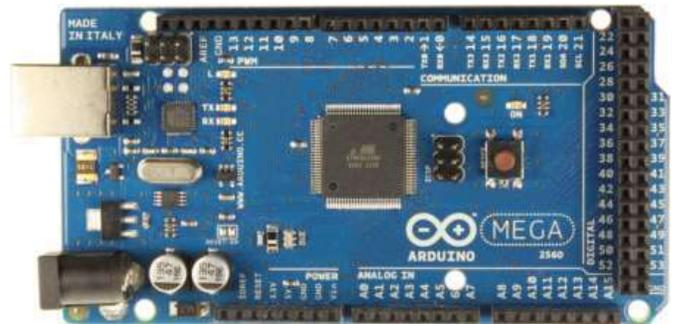


5. HARDWARE DESCRIPTION

5.1 Arduino mega

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Mega is compatible with most shields designed for the Arduino Duemilanove or Diecimila.

The input voltage (7-12v) to the Arduino board when its using an external power source(as opposed to 5volts from the USB connection or other regulated power source).



5.2 Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke. Buzzer is an integrated structure of electronic transducers, DC power supply, widely used in computers, printers, copiers, alarms, electronic toys, automotive electronic equipment, telephones, timers and other electronic products for sound devices. Active buzzer 5V Rated power can be directly connected to a continuous sound, this section dedicated sensor expansion module and the board in combination, can complete a simple circuit design, to "plug and play."

5.2.1 SPECIFICATIONS

- i. On-board passive buzzer
- ii. On-board 8550 triode drive
- iii. Can control with single-chip microcontroller IO directly
- iv. Working voltage: 5V
- v. Board size: 22 (mm) x12 (mm)

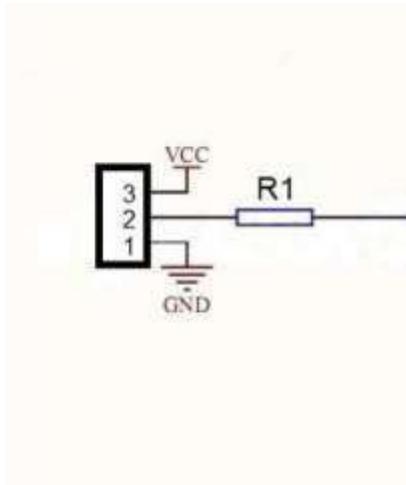


Fig 5.4 Buzzer Circuit Diagram

5.3 PILL CONTAINER AND DISPENSER

The pill/capsule container design will have 8 slots available for medications. The 8 slots will be labelled so that the caregiver can ensure setting the alarm for the correct slot. Additionally, the pill container will incorporate interlock sensors to protect the caregiver and user from harm. Finally the sensors will provide input to the microcontroller for determining access doors status, medication slot positioning and time feedback of the patient accessing the medications.

The pill/capsule container design is made up of plastic body with glass container which is portable and it can be charged.

5.4 LED

The Light emitting diode display will be a simple red light; it provides information such as power on, flashing as he speaker beeps to have the attention of the user and emergency indication. It also provides pre-selected precautions to the patient concerning the medications being currently dispensed.

5.5 LCD

Liquid Crystal Display (LCD) is an Alphanumeric display. It means that it can display Alphabets, Numbers as well as special symbols thus LCD is a user friendly Display device which can be used for displaying various message unlike seven segment display which can display only numbers and some of the alphabets.

The only advantages of LCD over seven segment display is that seven segment is robust display and can be visualized from longer distance as compared to LCD. Here we have used 20x4 alphanumeric display.

6. RESULT

The LCD which is interfaced with Arduino will keep on displaying the time. The pill slots in accordance with the particular time will open automatically along with an LED and a Buzzer indication. The closure of

the slots will be manually done. LCD is also used for the indication of which medicines are to be taken before and after meal.

GSM module is interfaced along with this product. So that the information regarding the medication of aged has been sent to the caretaker through SMS or Call.

CONCLUSION

The hardware of the automatic medicine dispenser is designed and it aids the people to take medicines. At particular times, particular slots are opened. If the box is opened, LCD will show the time and it also shows before meal or after meal. LED also will glow for every opening of slots. If the box is opened, GSM also sends the message to the user as a reminder.

7. REFERENCE

1. Ostrom, J., Hammarlund, E., Christensen, D., Plein, J., & Kethley, A. (1985). Medication usage in an elderly population. *Med Care*. 23 (2), 157-164.
2. Haynes, R. (2001). Interventions for helping patients follow prescriptions for medications. *Cochrane Database Systematic Review*. (1).
3. Sabate, E. (2003). *Adherence to long-term therapies, evidence for action*. Geneva, Switzerland. World Health Organization.
4. Osterberg, L., & Blaschke, T. (2005). Adherence to medication. *New England Journal of Medicine*. 353 (5), 487-497.
5. Savir J, Sharon R, Ben-Zur G, Gan-Ner. Online Smart Pill Box Dispensing System. Patent no: US2009/0299522 A1, 2009. Mei-Yeung Wang, "A Mobile Phone Based Medicine In-take Reminder and Monitor", 9th IEEE International Conference, June 2009.
6. Ramage-Morin, P. (2009). Component of Statistics Canada catalogue. *Statistics Canada*. 20 (1).
7. Reach, G. (2009). Can technology improve adherence to long-term therapies? *Journal of Diabetes Science and Technology*. 3 (3) 492-499
8. Medsignals. (2011). Retrieved December 4, 2011, from <http://www.medsignals.com>
9. Brown, M., Bussell J. (2011) Medication Adherence: WHO cares? *Mayo Clinic Proceedings*. 86 (4), 304-314.
10. Office of Consumers Affairs. (2011). The expansion of cellphone services. *Industry Canada*. Retrieved November 8, 2011, from <http://www.ic.gc.ca/eic/site/oca-bc.nsf/eng/caQ2267.html>
11. A Smart Pill Box Uses Face Recognition Tech to Ensure We Take Our Meds. *Popular Science Magazine*. 2011 Jan 28.
12. from: <http://www.popsci.com/science/article/2011-01/smart-pill-box-taps-face-recognition-tech-ensure-we-take-our-meds>.
13. Easy-to-use pill dispenser with clock talking reminder. 2014 Feb 7. Available from: <http://www.epill.com/week->