# Automatic Multipurpose Medecine Dispensing Machine

**Omair Shaikh, Keyur Shinde, Chintan Shah, Ashwin Patel, Prof. Pradnya Kamble**

***Abstract*— This paper comprehensively reviews about medicine dispensing machine which helps to reduce manual efforts in rural areas, villages.**

**Today India is a fairly modern country if one looks at the rapid urbanization in most cities. However, rural India is still crawling towards progress. Some villages don't even have basic needs met such as the provision of electricity or medicines. Our project is an initiative to bring generic medicines to the mass living in areas of scarce population and resources. It would benefit the rural population as well as urban population if installed at train stations, Bus depots and also long distance buses.**

***Index Terms*— Generic medicine, Dispensing Machine,**

## I. INTRODUCTION

'Automatic Multipurpose Medical Dispensing Machine ' is the concept designed for medical emergency in rural areas where not much facilities are available.

Need:

• According to a WHO report in 2012, only 35% of the total Indian population has access to generic medicines.
• Also, the ratio of doctors to the population of India is 1:2500
• This machine will be a valuable source of medicines in areas where hospitals or medicine stores are not within reach. These medicines can provide preliminary treatment till the person can reach a hospital.
• In transit, this machine would dispense the needful Medicine for basic illnesses if need be.

Scope:

• The scope of this project is vast as it can be applied in rural as well as urban areas.

Areas of application include:

• Villages
• Remote areas
• Train stations,
• Long distance Buses
• National highways

The automated medicine dispensing machine uses hardware to physically vend medicines. This machine has number of features which include a touch screen mechanism, a GSM module to make calls to a consulting physician, a temperature sensor to sense fever ,heart rate monitoring system.

**Manuscript received January 21, 2015.**

**Omair Shaikh, Keyur Shinde, Chintan Shah, Ashwin Patel, Prof. Pradnya Kamble,** Department of Electronics and Telecommunication K. J. Somaiya Institute of Engineering & Info. Technology, Mumbai 400022, India

## II. BLOCK DIAGRAM

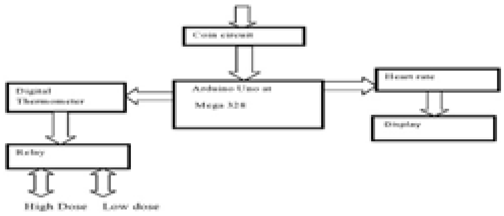



Fig. 1 Basic Block Diagram

### *A. Digital Thermometer:*

Now we bring you two versions of a homemade digital thermometer with ICL7106 that I recently built. One version uses a LED display, the second version LCD display. In both versions, is used silicon transistor as a temperature sensor. The temperature is determined by the voltage drop, temperature dependence is approximately -2.2 mV / °C. Power can be either a 9V battery or a suitable power supply. Oscillator with R1 and C1 determines the sampling frequency - using 100k and 100p the frequency is 3 Hz. Theoretical temperature range is from -199.9 to 199.9 °C, the real temperature range is limited by the measuring transistor to approximately -65.0 To 150.0 °C. Resolution to 0.1 °C. If you want to use it as a room thermometer, it is not necessary.

#### *a) Temperature sensor*

The LM35 is a precision temperature sensor, whose output voltage is linearly proportional to the temperature in degrees Celsius. The LM35 thus has an advantage over linear temperature sensors calibrated in ° Kelvin, as the user is not required to subtract a large constant voltage from its output to obtain convenient Centigrade scaling.

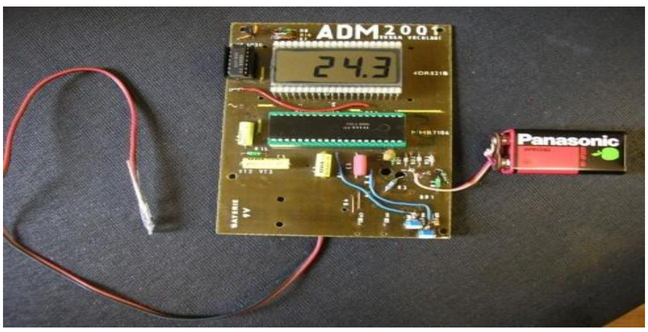



Fig. 1. Digital Thermometer

**Calibration**

The thermometer must be calibrated. Calibration is performed using the trimmer P1 and P2 in two steps. The first step is to set the zero using crushed ice (the ice and water mix). Set P2 approximately in the center. Probe (Transistor) Place in a waterproof container and dip into crushed ice (ice pieces in water). After stabilizing the set P1 and to display 00.0 °C. In the second step P2 is set according to a known temperature, preferably in boiling water at 100 °C

*B. Touch screen*

LCD Capacitive Screen (LC TTP229)

A capacitive touch screen panel consists of an insulator such as glass coated with a transparent conductor such as indium tin oxide (ITO). As the human body is also an electrical conductor, touching the surface of the screen results in a distortion of the screen's electrostatic field, measurable as a change in capacitance Different technologies may be used to determine the location of the touch. The location is then sent to the controller.

LCD display 16*2

| Sr no. | Specification | Rating |
|---|---|---|
| 1 | Power Voltage | 0 to 7V |
| 2 | Supply Voltage | 3V |
| 3 | Operating temperature | 0 to 50 degree Celsius |
| 4 | Storage temperature | -10 to 60 degree Celsius |

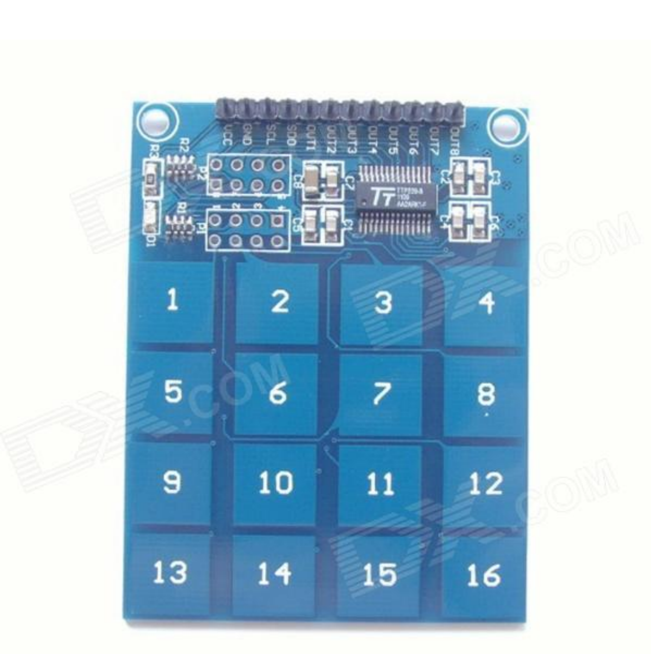



Figure 3 LCD Display

*C. Relay Module*

It used to control the lighting, electrical and other equipments. It can be controlled directly by a wide range of microcontrollers and can be controlled through the digital IO port, such as solenoid valves, lamps, motors and other high current or high voltage devices. [1]

| Sr no. | Specification | Rating |
|---|---|---|
| 1 | Operating power | 360mW |
| 2 | Max switching voltage | 250 V AC, 100 V DC |
| 3 | Max switching power | 2,500 VA |
| 4 | Max switching current | 10 A (AC), 5 A (DC) |

Table: Relay specification

A relay is an electrically operated switch. Many relays use an electromagnet to mechanically operate a switch, but other operating principles are also used, such as solid. Relays are used where it is necessary to control a circuit by a low-power signal (with complete electrical isolation between control and controlled circuits), or where several circuits must be controlled by one signal. The first relays were used in long distance telegraph circuits as amplifiers: they repeated the signal coming in from one circuit and re-transmitted it on another circuit. Relays were used extensively in telephone exchanges and early computers to perform logical operations.

The Woertz relay modules are marked according to the following standards: A1 Positive coil connection A2 Negative coil connection 1 Common connection at the changeover commutator 2 NC contact 3 or 4 NO contact If the module has several relays or the relay several contacts, an index is also added to designate the connection and contact

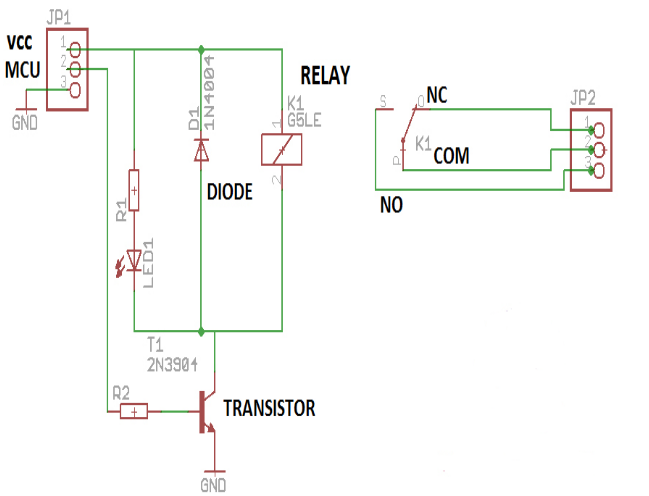
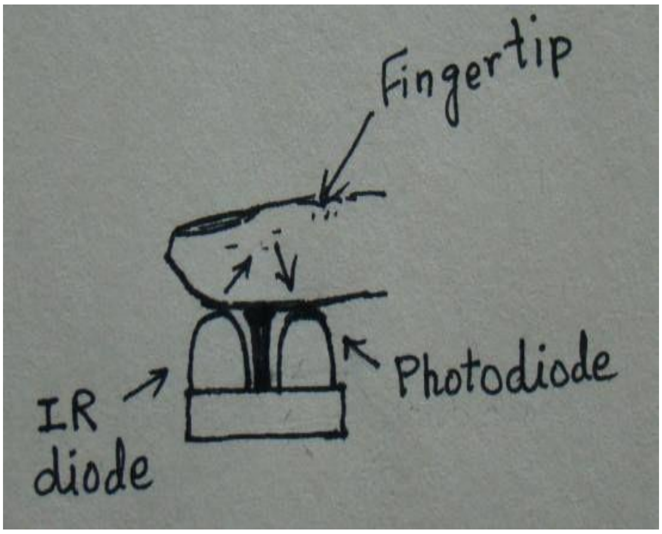



Figure 3. Circuit diagram of Relay Module

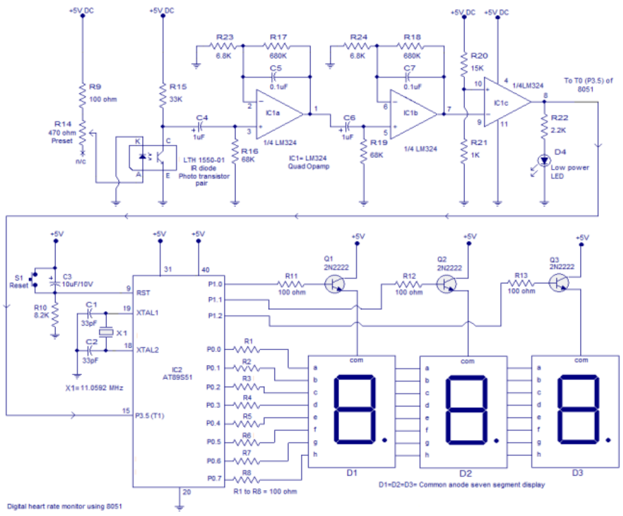
.

*D. Heart Rate Monitoring System*

Heart rate is a very vital health parameter that is directly related to the soundness of the human cardiovascular system. This project describes a technique of measuring the heart rate through a fingertip using a PIC microcontroller. While the heart is beating, it is actually pumping blood throughout the body, and that makes the blood volume inside the finger artery to change too. This fluctuation of blood can be detected through an optical sensing mechanism placed around the fingertip. The signal can be amplified further for the microcontroller to count the rate of fluctuation, which is actually the heart rate. This signal goes to the main microcontroller and it displays it on the LCD screen.




The sensor unit consists of an infrared light-emitting-diode (IR LED) and a photo diode, placed side by side, and the fingertip is placed over the sensor assembly, as shown below. The IR LED transmits an infrared light into the fingertip, a part of which is reflected back from the blood inside the finger arteries. The photo diode senses the portion of the light that is reflected back. The intensity of reflected light depends upon the blood volume inside the fingertip. So, every time the heart beats the amount of reflected infrared light changes, which can be detected by the photo diode. With a high gain amplifier, this little alteration in the amplitude of the reflected light can be converted. This pulse is displayed on screen through main arduano at mega 328 and needful recommendation medicine is done.



Circuit diagram of Heart Rate Monitoring System

*E. ARDUINO ATMEGA 328*

Today the ATmega328 is commonly used in many projects and autonomous systems where a simple, low-powered, low-cost micro-controller is needed. Perhaps the most common implementation of this chip is on the popular Arduino development platform, namely the ArduinoUno and ArduinoNano models.


This is the main microcontroller that controls all the inputs and output of all the applications and is responsible for output on the screen. It is used to drive the motor circuit. It is used to communicate with the PC.

| Sr no. | Specification | Rating |
|---|---|---|
| 1 | Low Power consumption | 1.8V, 25°C |
| 2 | Temperature | -40°C to 85°C |
| 3 | Voltage | 1.8-505V |
| 4 | Current | 250µA |

The high-performance Atmel picoPower 8-bit AVR RISC-based microcontroller combines 32KB ISP flash memory with read-while-write capabilities, 1024B EEPROM, 2KB SRAM, 23 general purpose I/O lines, 32 general purpose working registers, three flexible timer/counters with compare modes, internal and external interrupts, serial programmable USART, a byte-oriented 2-wire serial interface, SPI serial port, a 6-channel 10-bit A/D converter (8-channels in TQFP and QFN/MLF packages), programmable watchdog timer with internal oscillator, and five software selectable power saving modes. The device operates between 1.8-5.5 volts.

## III. CONCLUSION

The Automated Medicine Dispensing Machine proves to be an effective solution for rural as well as urban areas owing to its easy to use mechanism and simplicity of design. The touch screen makes it very easy to be used by any user. Options supported by images make this machine usable even for illiterate persons.

## IV. References


[1] http://www.youtube.com/ watch=6dlWauMeUC8, Microsoft imagine Cup' 09 (Team PARV,Asha a demonstration-prototype for a voice interactive medicine vending machine)

[2] http://learn.adafruit.com/tmp36-temperature-sensor/using-a-temp-sensor

[3] http://www.alldatasheet.com/datasheet-pdf/pdf/8866/NSC/LM35.html (Datasheet for LM35 Temperature sensor)

[4] http://embedded-lab.com/blog/?p=1671

[5] http://learn.adafruit.com/tmp36-temperature-sensor/using-a-temp-sensor