

DTMF Based Home Automation Without Using Microcontroller

Rajat Pandey^{1*}, Sourabh Pandey², Satendra Gupta³, Ravendra Singh⁴, Apporva Srivastav⁵

Abstract

Currently mobile has become our lifestyle, because of low price of housing automation and through DTMF. DTMF (dual tone multiple frequency) primarily based system contains 2 mobile phones, DTMF Decoder and UNL2003 main a part of the project. One mobile is employed as remote which can settled at way distance from home through that directions area unit felt occupation and another mobile is found reception act as a receiver. The management data area unit sent via the remote mobile as DTMF Tone, this DTMF tone is received by the mobile settled reception, the received DTMF tone is then decoded by DTMF Decoder IC MT8870. The output logic signal of Decoder is employed as input to the UNL2003. The UNL2003 to manage home appliances per output of DTMF Decoder. With the assistance of this technology, we will operate it at any place within the world and that we may management all the house appliances of the house. This technology can facilitate those folks that area unit physically challenged individuals. With this technology, they will operate all the house appliances simply with the assistance of mobile phones. Typically, once individuals exit of the house they forget to modify off the house appliances, and there could the wastage of power. The answer to the current drawback is DTMF (Dual Tone Multi Frequency) controlled home automation. We will management DTMF primarily based home automation with the assistance of mobile signal. Employing a DTMF technique the DTMF (Dual Tone Multi Frequency) decoder is connected to the relay that is controlled by the mobile by creating a telephone to the opposite mobile while not victimization microcontroller.

Keyword: DTMF MT8870 decoder, ULN2003, RELAY, mobile phone

INTRODUCTION

DTMF stands for Dual Tone Multi Frequency. The DTMF may be a sign system for recognizing the keys or on the dialed range of a button or just we will say it as a DTMF (Dual Tone Multi Frequency) input device. It is a mix of 2 undulation to represent a key the tones area unit referred to as

a rows and column frequency and that they area unit delineated on the DTMF input device. DTMF (Dual Tone Multi Frequency) switches on the long distance sign to the dialed range to' the voice frequency. Within the twin tone multi frequency if I press any key on the phone then it generates 2 tones of specific frequency may be a high frequency of tone and therefore the second may be a low frequency of the tone [1–5].

*Author for Correspondence

Rajat Pandey
E-mail: rp9807815529@gmail.com

¹⁻⁴Student, Department of Electrical Engineering, Babu Banarsi Das Institute of Technology and Management, Lucknow, Uttar Pradesh, India

⁵Assistant Professor, Department of Electrical Engineering, Babu Banarsi Das Institute of Technology and Management, Lucknow, Uttar Pradesh, India

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Modern homes have gotten smarter with the advancements in engineering and technology. Physical operation of wall Switches placed in several corners of the home is not Convenient particularly for the older and physically Disabled members gift within the home. World's population is ageing,

considering the increasing proportion of older persons nearly in each nation of the planet as a results of advanced health care technologies, i.e., a home automation system [6–10].

DTMF and parts for dominant and observance the house atmosphere. Many papers on Home Automation System have used Speech Recognition, Bluetooth, GSM and variety of alternative ways in which of operation of the system. In this paper, we have a tendency to gift a Home Automation and System (HAS) wherever dominant is done by victimization the idea of twin tone multi frequency coding to drive variety of electrical appliances (EAs) by suggests that of interfacing with a relay driver capable to try and do this [11–15].

COMPONENTS SPECIFICATION

DTMF Decoder (MT8870 IC)

The DTMF Decoder MT8870-IC receiver provide miniature area unit tiny size and high performance and low power consumption. This Decoder is representing twin tone (low and high) multi frequencies (Figure 1). Its design consists a band split filter section that is separating multi (high and low) cluster tones. Its frequencies are verified by a digital investigating section and period of received tones before passing [16, 17].

The MT8870 may be a DTMF receiver. It is consisting of each band split filter and decoder perform. Decoder is victimization additionally digital investigating technic to observe and decipher all sixteen DTMF tone try convert into four bit code (Figure 2).

		High Frequency Group			
		1209 Hz	1336 Hz	1477 Hz	1633 Hz
Low Frequency Group	697 Hz	1	2	3	A
	770 Hz	4	5	6	B
	852 Hz	7	8	9	C
	941 Hz	*	0	#	D

Figure 1. Frequency group.

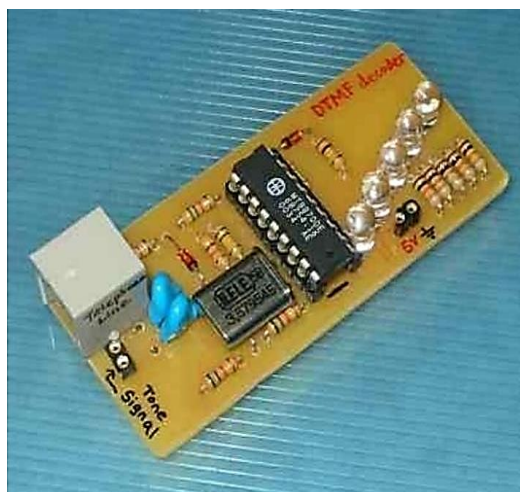


Figure 2. Circuit diagram of DTMF decoder controlled home automation project.

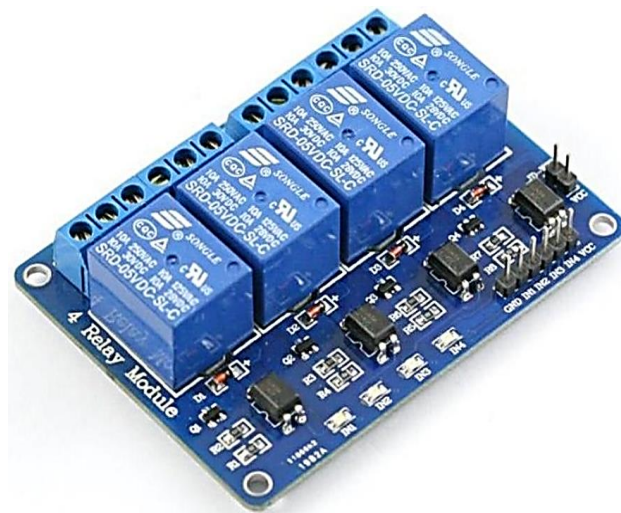


Figure 3. Four-channel relay module.

Four-channel Relay Module

A relay may be a device that permits US to show on or put off a circuit with voltage and/or current that is way higher than what Arduino might handle. Relay provides complete isolation between the low-tension circuit placed on the Arduino aspect and therefore the high-voltage aspect that is connected to the load. For this project we've got used a four channel, 5V Relay. This 5V 4-channel relay interface board and every channel desires a 15–20 mA driver current. It is wont to management varied home appliances and instrumentality with giant current. It is a regular interface which is controlled directly by DTMF.

ULN2003

The ULN2003 driver IC may be a Darlington electronic transistor array is thought for top voltage and high current capability. It incorporates seven NPN Darlington electronic transistor array with high output voltage and customary cathode clamp diode for switch inductive load (Figure 3).

Advantages of ULN2003

The ULN2003 is associate array of seven NPN Darlington semiconductor unit. It followed main options are given below.

- I. 500 mA rated collector current (signal output)
- II. Fifty output support (100 voltage output)

Application of ULN2003

- The ULN2003 IC is one amongst the foremost normally used motor driver IC.
- It's need for top current masses exploitation digital logic Circuit like Operational-Amplifier Timer Gate Arduino PIC arms.
- ULN2003A is employed in driver Circuit for relay lamp crystal rectifier show vessel motor logic buffers and line driver.

BLOCK DIAGRAM

The user is transmitted a decision to the mobile at the receiver thanks to the automated decision settle for the signal from the transmitter mobile gets transmitted. Consistent with the input applied by the user from his dial computer keyboard, the DTMF decoder decodes the input and controls the devices at the output exploitation (fan, bulb,). Thus, home appliances are controlled in a very easy manner by exploitation DTMF decoder while not exploitation small controller. It is easy, save time as a result of user management, the output with no interruption (Figure 4).

Advantages

- This project is simple to access and straightforward
- It is controlled from remote areas
- It is terribly low power consumption
- Low price of the component. It is operated for long time.

FLOWCHART

The automation starts once the user at the sending finish makes the decision by typewriting digit in dial computer keyboard mobile. If the portable at the receiver received the decision, then the signal is processed by the DTMF decoder. The DTMF decrypt decode the 2 frequencies i.e. high frequency transmitted or received and low frequency transmitted or received then produces the binary output digit consistent with the input applied by the user at sending finish. If the portable at the receiver gets no input received, then there'll be no method done by the DTMF (Figure 5–6).

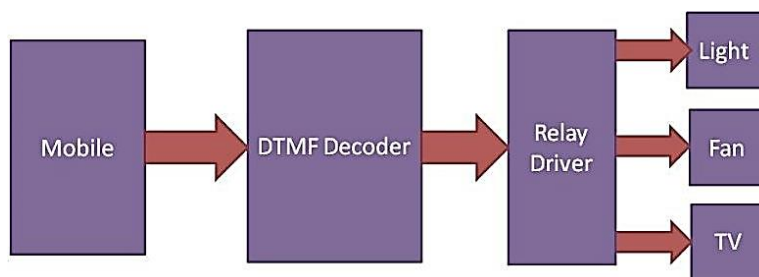


Figure 4. Block diagram of DTMF based home automation.

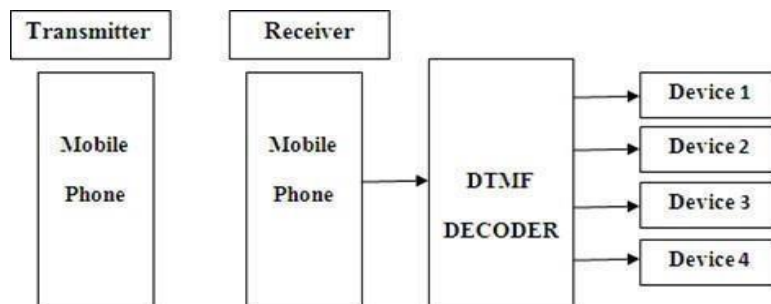


Figure 5. Flowchart determining DTMF based automation.

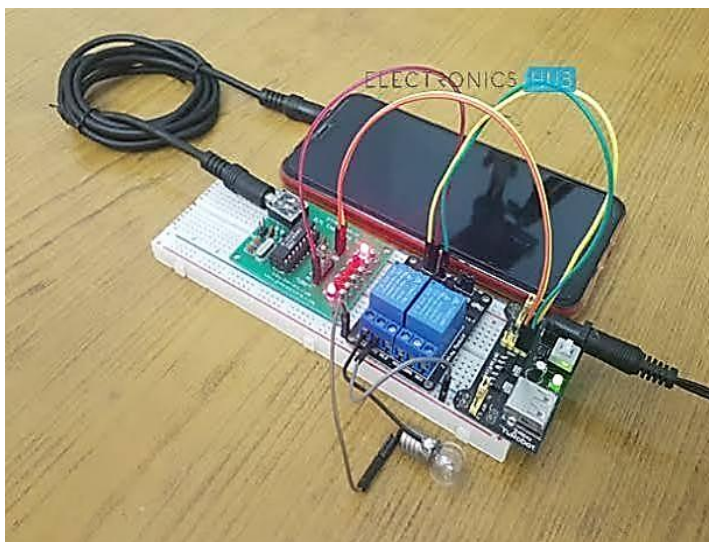


Figure 6. DTMF based home appliance without microcontroller project outcome.

RESULTS AND FUTURE SCOPE

The main parts during this circuit square measure MT8870 DTMF decoder (a variant known as CM8870 IC is employed here). once you create a decision to the mobile that is connected at the receiver finish, the MT8870 IC provides high pulse at fifteenth pin once receiving a sound signal.

Currently if you press one from the mobile the output of the decoder IC at pins Q1, Q2, Q3 and this fall are one, 0, zero and zero severally.

As the Q1 pin is connected to the input of the relay, it'll be activated and as a result, the load is turned ON. to show off the load, press any range that creates Q1 as zero i.e. two as an example.

CONCLUSION

The DTMF primarily based automation is meant success absolutely. This is often technology kind device which will controlled the house applied while not the small controlled is employed during this system so controlled anyplace round the world, once the uses at the transmitter calls to the portable at the receiver and presses the key on the computer keyboard and additionally offer the commend key of your portable, so it is management the device consequently from all over with the low price technology.

So, the system is with success management device by DTMF technology. It is supported input given from the portable. This paper presents a technique to manage a domestic system exploitation the DTMF tone generated by sending phone, phone instrument once the user pushes the computer keyboard buttons of the portable connected to the remote domestic system. This management methodology uses industrial mobile communication networks because the path of information Transmission. This allows the user to manage the system unendingly by causing the portable DTMF tone. The advantage of this method is that it is operated remotely. This method is a lot of reliable and it also can be used for security purpose.

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