

# Automation Using Android Phone

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**Abstract** – In this competitive world human cannot spare his time to perform his daily activities manually without any fail. With this even the power failure will be wasted up to some extent. This project gives the best solution for completely eliminating the manual operation. The primary aim for this project is to innovate existing automation systems and reduce human efforts.

This paper presents the design and implementation of the automation system [home automation, office automation, industry automation, farm automation etc.] which uses the DTMF technology with the new modern technology similar to that of whatsapp messenger. The main function of the system is to control any electrical devices through mobile phones. Whatsapp messenger is a smartphone messenger available for Android, Blackberry, iPhone, Windows Phones and Nokia Phones. By this automation system one can remotely control the electrical appliances at home using messenger. One has to simply message “Turn on XX” to the android phone which is there at home to turn on the XX appliance. Also, the turn-off procedure is the same. This system can be easily installed and implemented.

**Keywords** – DTMF, Android, Whatsapp Messenger, iPhone, Blackberry, Windows.

## I. INTRODUCTION

The explosive growth in cellular mobile communication in the recent decade is changing the way people live and work. Mobile handsets today are essentially hand held computers with integrated communication capabilities. The handsets allow users to download and run applications. This opens the door for introducing a vast variety of functionalities to the mobile phone and making the mobile a real intelligent device. Controlling and monitoring of various home appliances by a single system and brings greater convenience, better security, communication medium. A key to the automation system is the capability for remote operation.

These systems rely on the internet as the medium for communication and generally feature friendly graphical user interfaces.

## II. OBJECTIVE

The main aim of the project is to operate any home appliances by using Whatsapp messenger in Android phone and DTMF decoder circuit which is interfaced with the microcontroller. The message is sent from one mobile device to the Android phone which is present at home via the internet. It produces a tone which is decoded and sent to the microcontroller. This signal is sent to the microcontroller which turns on or off the relays according to the input signal. With this system, it is also possible to

remotely operate the water pumps on the farm land by which the work load of the farmer can be reduced.

## III. PROBLEM DEFINITION

This invention discloses a method of latest technology Android and Whatsapp messenger which is compatible with any mobile phone. The main motive of this project is to develop a device that allows for a user to remotely control and monitor multiple appliances using a cell phone. This system will be a powerful and flexible tool that will offer this service at any time, and from anywhere with the constraints of the technologies being applied. A possible target is appliances and lights anything with an electrical interface. The proposed approach for designing this system is to implement a microcontroller-based control module that receives its instructions and commands remotely. For security purposes, a means of identification and user authentication will be implemented, and will combine identification with a password authorization. The existing systems are using DTMF technology but they are not using the internet for the same.

## IV. THEORETICAL BACKGROUND

Considerable efforts have been put into the development of remote control systems for home automation. Earlier systems are mainly based on the use of telephone line, such as a phone-based system for home automation using a hardware-based remote Controller [1] [2], and a personal computer [3]. The above systems make use of the telephone as the remote controlled input device and have no friendly user interface. With the proliferation of Internet, various Internet-based remote control architectures for home automation have been proposed [4]-[8]. All the system mentioned above suffered from two main drawbacks.

1. The systems were made considering a single platform which restricted their usability. As of now market have more than 10 brands in the field of smart phones with each running on a different platform.
2. Any mobile application made till now were mostly client based, this meant that in future if an upgraded version of the application is available, then user will have to remove the old version and install the new version. This is indeed a very tedious task and definitely not what a customer wants.

In the field of application development the above mentioned points have been a major drawbacks which has restricted the growth of mobile computation in the recent past.

## V. HOME AUTOMATION SYSTEM USING WHATSAPP MESSENGER IN ANDROID

Send your message using whatsapp messenger from anywhere in the world and remotely turn on/off relays. The DTMF will convert the tone into corresponding signal. This interface uses the popular MT8870 DTMF decoder IC along with AT89C51 Microcontroller.

Features:

- Outputs - Relays x 8
- Fully microcontroller based interface using AT89C51.
- Password Protected.
- Acknowledgement tone output for the user.
- Very user friendly.

## VI. BLOCK DIAGRAM

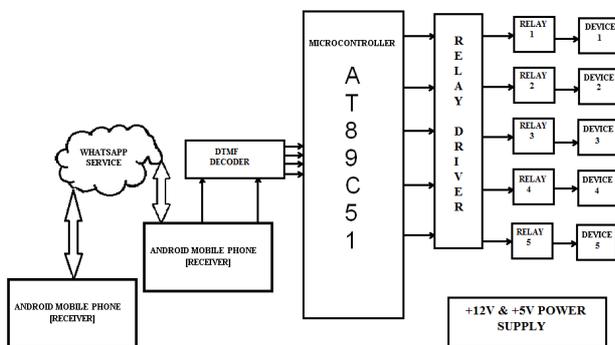


Fig. 1. Block Diagram of Automation System

## VII. DESCRIPTION OF BLOCK DIAGRAM

### 1] DTMF Decoder:

All types of empty 8870 series use digital counting technique to detect and decode all 16 DTMF tone pairs into a four bit code output. The built in dial tone rejection circuit eliminates the need for filtering.

Digit	TOE	INH	Est	Q <sub>4</sub>	Q <sub>3</sub>	Q <sub>2</sub>	Q <sub>1</sub>
ANY	L	X	H	Z	Z	Z	Z
1	H	X	H	0	0	0	1
2	H	X	H	0	0	1	0
3	H	X	H	0	0	1	1
4	H	X	H	0	1	0	0
5	H	X	H	0	1	0	1
6	H	X	H	0	1	1	0
7	H	X	H	0	1	1	1
8	H	X	H	1	0	0	0
9	H	X	H	1	0	0	1
0	H	X	H	1	0	1	0
*	H	X	H	1	0	1	1
#	H	X	H	1	1	0	0
A	H	L	H	1	1	0	1
B	H	L	H	1	1	1	0
C	H	L	H	1	1	1	1
D	H	L	H	0	0	0	0
A	H	H	L	undetected, the output code will remain the same as the previous detected code			
B	H	H	L				
C	H	H	L				
D	H	H	L				

Fig. 2. DTMF data output table

### 2] Microcontroller AT89C51:

It is a low power, high performance CMOS 8bit Microcomputer with 4 Kb flash memories. The output from port pins of a microcontroller is fed to the relay driver to drive the relay.

### 3] SPDT Relay:

It is used to switch on or off the output appliance. Relay operates mechanically so it cannot be operated at high speed.

### 4] Power Supply:

This block converts 230V AC into +5V DC & +12V DC. The +5V required for microcontroller board DTMF decoder etc. The +12V is required for relay driver circuit.

## VIII. CIRCUIT DIAGRAM

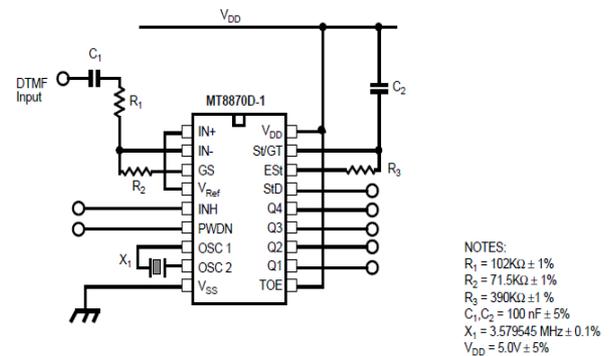


Fig. 3. Circuit Diagram of DTMF MT8870 Decoder

## IX. HARDWARE REQUIREMENT

- Power supply
- AT89C51 Microcontroller Board
- DTMF decoder
- Relay Driver Board
- Android Phone

## X. ADVANTAGES

The user can have access to the appliances from various places instead of one place. Achieve more diversity on different application development platform. The problem of a versioning system is removed. This ensures that if an update is available then the old version needs not to be removed to use the new version.

## XI. RESULT

Of all the design is successful and we are able to get the expected output for the design. The microcontroller works on the basis of the code. The loads are operated in accordance with the code which was implemented by using Keil software. When the message is sent from the messenger, the signal will be passed and received by phone which is present at the location. This signal is sent to the microcontroller which decodes the signal and performs the corresponding action in accordance with the button pressed in the remote mobile phone. In this way,

we can automate any electrical device using DTMF technology & android phone. The messenger can be downloaded in .apk extension. All the time home can be save from automation so that we will have much more time work on the other things or pursuits.

## XII. FUTURE SCOPE

This product is aimed at average consumers who wish to control household appliances remotely from their cell phones provided that the appliances are electrically controllable. Right now we have designed the project for control of eight devices but it can be design for a number of devices. Since, it is very easy to upgrade as per the requirement, finds a wide range of applications in the areas of home automation, Office Automation, Industrial automation, to control water pump sets in agricultural fields. The security system can be employed in the household or any organization, monitoring and controlling of devices using Android phone. If this is possible on two platforms, it opens the market to all OS. This makes it all platform compatible in the very near future.

## XIII. CONCLUSION

The design and implementation of a novel mobile-based home automation system without Operating System constraint is presented. The design consists of a mobile phone with Android or Blackberry or iOS applications, and a microcontroller (basically the Hardware). The home appliances are controlled by the microcontroller, which operates according to the user commands received from the mobile phone via the Whatsapp messenger. Such a design transforms a mobile phone into a portable remote controller for home automation. It is noted that the proposed system is not restricted to home automation, it can be applied directly to remote control of many industrial devices. Many new technologies are exploring more and more and day by day. Smart is the good and beneficial who is very much easy with their professional life and also for those who are about security and comfort but they want to save their electrical energy that is wasted by many people in regular span of time. With the introduction of smart home people are living and will obviously live more comfortable life

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