DTMF BASED HOME AUTOMATION AND APPLIANCES CONTROL SYSTEM

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ABSTRACT :

A lot of work has to be completed by the people in today's competitive world not only that they have to look over the home, office, farm, etc simultaneously. But in industries, we manually operate the equipment pieces so the human effort and the maintenance cost are increasing. So to overcome these problems from the remote places we are controlling the devices. The system is designed such that we can control the devices by the technique DTMF. DTMF is a dual-tone multi-frequency. It is used to convert the desired frequency into analog signals and which are being transferred to the DTMF decoder and it sends the data to the microcontroller. Controlling the loads through the DTMF technique by using the mobile we can operate from any place.

INTRODUCTION

The main aim of the system is that within the absence of the homeowner it should enable security. The devices connected reception, office, etc it consumes electrical power. These devices should be controlled also as turn on/off if required. Most of the time it had been done manually. Now we will control the devices from anywhere more efficiently during this system we are getting to develop a cellular phone-based household appliance. this technique is meant for controlling arbitrary devices, it includes a telephone (not included with the system kit, the end-user has got to connect his/her telephone to the system) which is hook up with the system via headset. To active the cellular phone unit on the system a call is to be made and because the call is answered, in response the user would enter a decimal number to access the system to regulate devices because the caller press the precise number, it leads to turning ON or OFF the precise device. The device switching is achieved by Relays. Security preserved, these dedicated passwords owned and known by selected persons only.

Giving the user a foreign on/off mechanism, this is often capable of informing up to 5 different numbers over the telephony network about the character of the event.

The underlying principle mainly relies upon the power of DTMF (Double Tune Multi-Frequency) ICs to get DTMF like variety or code within the number pad and to detect an equivalent number or code from its corresponding DTMF.

In detail, a DTMF generator generates two frequencies like variety or code within the number pad which can be transmitted through the communication networks, constituting the transmitter section which is just like a mobile set within the receiver part, the DTMF detector IC, IC MT 8870 detects the amount of code represented by DTMF back, through the inspection of the 2 transmitted frequencies. The DTMF

frequencies representing the number/ codes. The project is formed around AT89S52MCU.DTMF keyboard is placed out ona four cross four matrices, throughout that every row represents low frequency, every column represents high frequency, with DTMF, and each key passed on a phone generates 2 tones of the precise frequencies one tone is generated from a high-frequency tone and low-frequency tone.

These tones are converted to digital form using the DTMF decoder circuit. These codes are the address of the destination which is read and preceded by the pc that connects the caller to the destination. The DTMF decoder circuit utilized in many electronics projects for better connectivity to regulate the applications.In this the data is given to the MC and therefore the supply is given to all or any components, The LCDs in 16 x2 whether the load is ON or OFF it displays depending upon this the keypad tone frequency of mobile. The MC output is additionally given to relay which acts as a switch and by this the hundreds will activate or OFF.This project uses regulated 5V, 500mA power supply. 7805 three-terminal transformer is employed for voltage regulation. Bridge type full wave rectifier is employed to rectify the ac output of secondary of 230/12V transformer
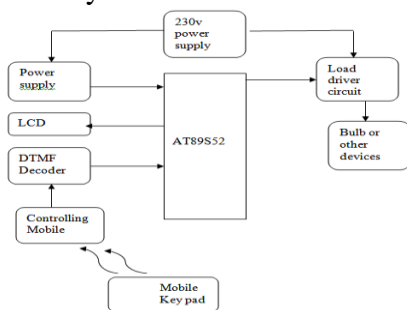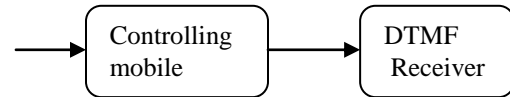

Fig: Block Diagram of DTMF based home appliances

DESCRIPTION:

The technology that we used is the Dual-Tone Multi-Frequency (DTMF). to regulate the devices from the remote place we are using the DTMF technique. A DTMF decoder detects the frequency tones and generates the binary sequence like key pressed during a mobile keypad.

In this project the mobile keypad gives the commands to the controlling mobile and it transmits the info to the DTMF decoder and it changes the sequence into binary form and provides the info to the microcontroller. The input from a power supply is given to the microcontroller AT89S52.

Forgiving command, we've to dial the number on the mobile keypad assail field. This mobile is on auto answering mode. this may receive your call. Then particular key's assigned to each controlling action. E.g. – key 2- activate load1, key 8- close up load1. Key 4-turn on load 2, key 6-turn offload 2, key 5-turn off both load 1, and a couple of. such by giving commands from a mobile you'll control the load. i.e.; mobile keypad and thus it operates, depending upon this the hundreds ON and OFF.

The power supply 230v ac is given to the step-down transformer and it converts it into 12v ac then it transmits to bridge rectifier and only 5v dc is generated. Then it's connected to all or any the components for 5v power supply.
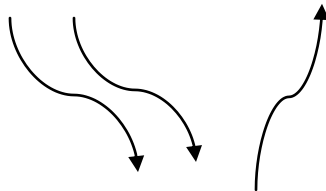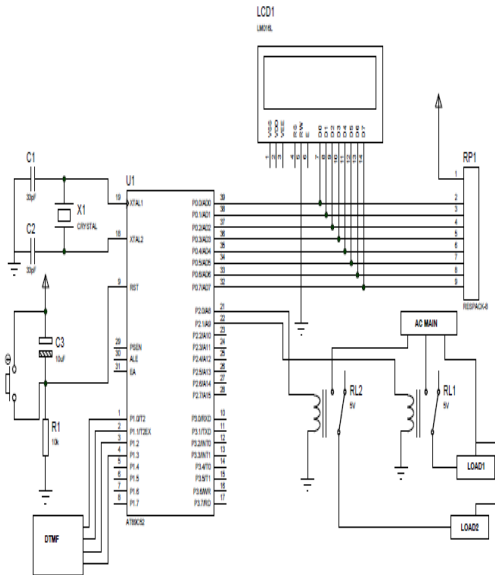
Fig: Represents schematic diagram

DTMF DECODER:

DTMF (Dual-tone multiple frequencies) decoder. Corresponding to the key pressed within the DTMF keyboard it generates the binary sequence. In most landlines, mobile phone handset, etc the DTMF keypad is wont to detect.

To detect the dialed number called by the caller the DTMF decoder is used at telephone switching centers. The DTMF decoders, therefore, are employed by the phone and are referred to as touch button and it's operated by pushbuttons and

therefore the version employed by the DTMF decoder trademark is AT&T. The IC utilized in the DTMF decoder is (MT8870DE). The tones generated by the keypad of a cellphone or by the pc software.

The tones generated from the speaker of the keyboard area unit given to electro-acoustic transducer that converts audio tones into electrical signals.The signals from the electro-acoustic transducer area unit processed by the DTMF decoder

IC that generates the equivalent binary sequence as a parallel output.

Fig: Represents diagram of DTMF

Description of MT8870DE:

The band split filter digital decoder functions both are been decoded in DTMF receiver by the MT8870D/MT8870D-1. For high and low groups filters the filter. The filter technique used is the filter section uses a switched capacitor. For digital counting purpose decoders are wont to detect and decode all 16 DTMF tone-pairs into a 4-bit code.
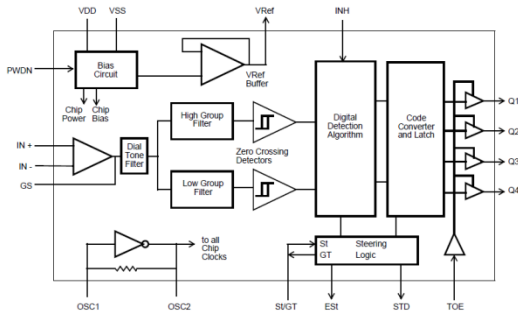
Fig: Represents Functional diagram

SOFTWARE USED

• Embedded C Language

• Keil compiler

• Micro c flash

Keil development tools for the 8051 Microcontroller design support each level of embedded code.

The industry-standard KeilCompilers, Macro Assemblers, Debuggers, period of time Kernels, Single-board Computers, and Emulators support all 8051 derivatives.Select the microcontroller device database for a starting a replacement project and therefore the µvision IDE sets all compiler, assembler. Debugger accurately simulates on-chip peripherals in Keil software(PC, UART, SPI, Interrupts, I/Ports, A/D convertor, D/A convertor, and PWM modules).To understand hardware configurations and avoids time wasted on setup issues.

Additionally, with simulation, you may write and check applications before target h/w is offeredJTAG adapter to download and test program code on a track system.

Click on the Keil µVision Icon on Desktop
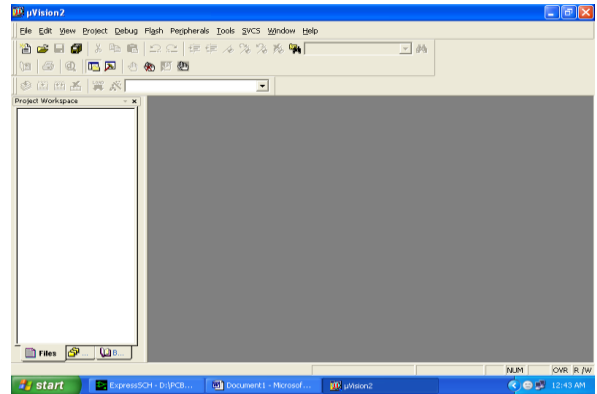
The following fig will appear

Fig: Opening of Keil software

Click on the Keil µVision Icon on Desktop
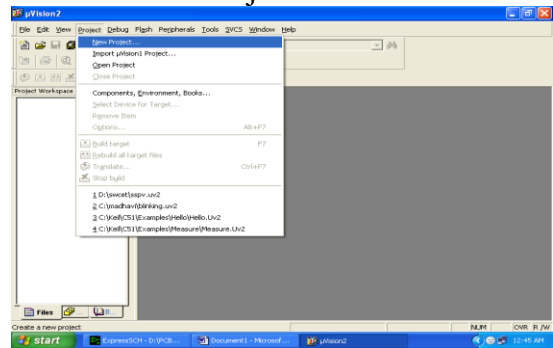
1. Click on the Project menu from the title bar

Fig: Creating a new project

2. Save the Project by typing suitable project name with no extension in your folder sited in

either C:\ or D:\

Then click on the save button above.

3. Select the component for the u r project. I.e. Atmel……

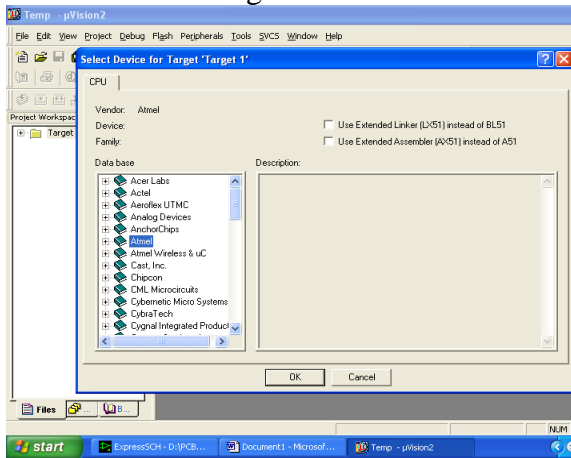4. Click on the image beside of Atmel

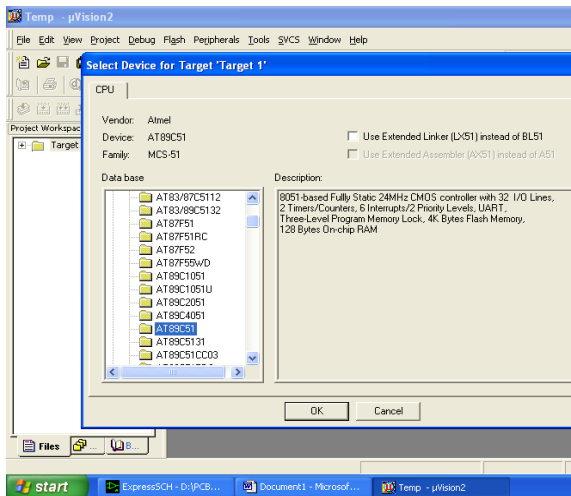Fig: Window for choosing ATMEL

5. Select AT89C52 as shown below

Fig: Window for choosing Microcontroller
AT89C52

6. Click on "OK"

7. Then Click either affirmative or
NO………mostly "NO".

8. Now your project is prepared to USE

9. Now double click on the Target1, you

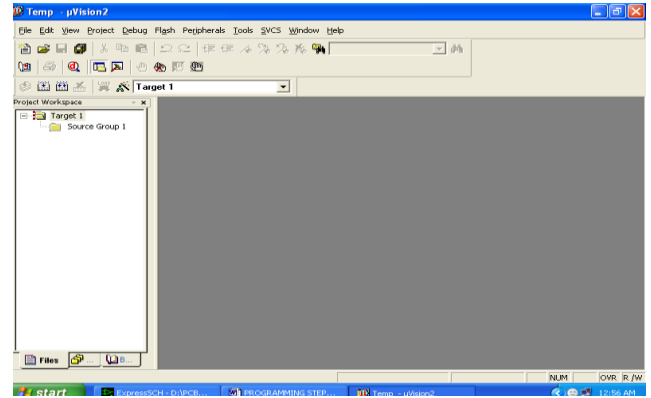will get alternative possibility "Source cluster 1" as
shown

Fig: Window for creating a source file

10. From file option click on the menu bar
then select "new''.
11. For the opposite new screen just
maximize it by double-clicking on its blue
border.
12. Start writing program in either in "C" or
"ASM"
13. If a program written in Assembly,
reserve it with the extension ". asm"
14. Now right click on Source group 1 and
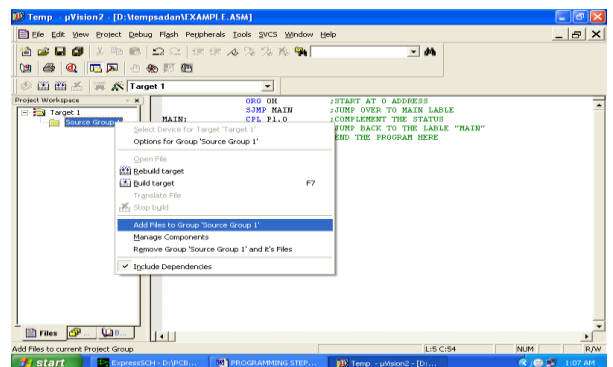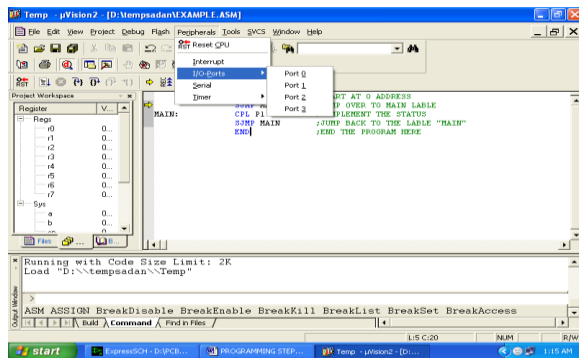click on on "Add files to Group Source"

Fig: Window for adding files to the source
group

15. By default "C" files will appear on another window.

16. Select the file extension given for saving the file.

17. Click just one time on option "ADD"

18. Press function key F7 to compile.

19. If there is no error in the file, then press Ctrl+F5 simultaneously.

20. Then click "OK"

21. Click on the Peripherals from the menu bar, and check your required port as shown in fig below

Fig: Window for checking the port

22. Drag the port aside and click on within the program file.

Fig: Window for checking the output

23. Now keep Pressing function

24. key "F11" slowly and observe.

you're running your program successfully

Fig: Before dumping program into a chip

Fig: Inserting the microcontroller and shutting the pin

RESULT

Whenever the facility supply is given to the kit it runs regarding the command which we give to the mobile keypad and undergo DTMF decoder and transmits to controlling mobile and at LCD side it displays the knowledge i.e, which load is in ON/OFF condition.
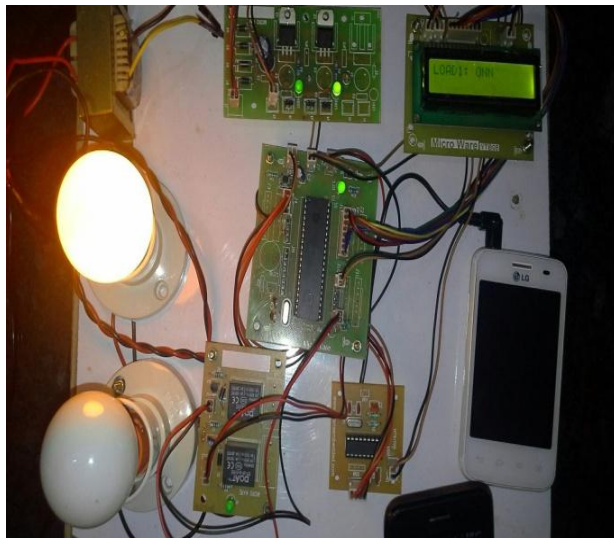
Fig: Output of the circuit when load1 is ON

Fig: Output of the circuit when load1 and load2 is OFF

Fig: Represents Output of the circuit when

load2 is ON

Fig: Output of the circuit when two loads are ON

Conclusion:

- The project has been developed by integrated features of all the hardware components used. The presence of each module has been reasoned out and placed carefully thus contributing to the simplest working of the unit.

- Using highly advanced IC's and with the assistance of growing technology the project has been successfully implemented.

- Finally, we conclude that "DTMF BASED APPLIANCES CONTROL " is an emerging field and there's enormous scope for research and development

References:

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