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Clap Pattern Based Electrical Appliance control

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Abstract - *In this paper, we present idea to control Electrical Home Appliances like Light, TV, Fan, Bulb etc. using Clap. There are various techniques available to control Electrical Home Appliances such as IR based remote control switch, ON OFF Switch, Using WIFI or Bluetooth Device control. But our method is most cost effective. This project has a big social impact. Our aim is that physically challenged user. We design PIC based circuit to detect clap from other sounds.*

Key Words: Hand Clapping, Condenser microphone, sampling LED, Relay, Clap trigger circuit etc.

1. INTRODUCTION

Now a day's various methods are available for controlling devices. Example simple ON OFF switch, using SMS GSM based device is control, device control using IR remote, device control using WIFI or Bluetooth. These methods used for wired and wireless technology for the purpose and each technology have its own advantages and disadvantages. This projects deals with low cost new technology to control device. In clap pattern based electrical appliance control claps is used to turn ON or turn OFF device. Idea of project is when user claps for one time device one will turn 'ON' and if user claps for two times device two will turn 'ON' and if user claps for three times device three will turn 'ON' and two turn off device 1,2,3 user has to clap. For one or two or three times respectively again. In this project we are going to use PIC based suitable micro controller and condenser microphone to accept clap input from user.

2. LITERATURE SURVEY

2.1 Clap switching

This paper proposed by Somangshu Bagchi, Subhadip Ghosh, Deepak Nandi present an clap switching work prior to November 2013. In this project it gives knowledge of 555 timers, i.e. working of relay and clocks. In this type of device it provide the working of NE555 timer and the relay. The relay is switch it gives a path only when current flown through it. In this project the second timer triggers relay of conducting path it is established terminals of the load and the device is gets turned on. Time interval of the claps is checked with the time constant and it can be established by the RC configuration of T=1.1R7*C3 [1].

2.2 Control of Light and Fan with Whistle and Clap

This paper proposed by Kashinath Murmu and Ravi Sonkar present a Control of Light and Fan with Whistle and Clap work prior accepted in November 2004. In this paper, it can detect clap and whistle properly by removing most of the noise. But it complicated to distinguish between clap and tap on a table the with the analog circuits due to similar waveform generated by it [2].

2.3 Design of a clap activated switch

This paper is published Seyi Stephen olokede work prior accepted in July-December 2008. In this paper the clap activated switching device function properly by responding to both hand claps at about three to four meter away and finger tap sound at very close range, since both are low frequency sounds and produce the same pulse wave features. The resulting device is realizable, has good reliability and its relatively inexpensive [4].

2.4 GA-Based Feature Extraction for Clapping Sound Detection

This paper is published Jan Olajec, Roman Jarina, and Michal Kuba present GA-Based Feature Extraction for Clapping Sound Detection work from 25 September 2006. The results of the experiment does not give clear result, in which coefficient is more and less discriminative in the case of detecting clapping sound among other sounds. But it is valuable to notice the facts that: a) the performance increases when only selected features are led to the classifier; b) clearly, the highest and lowest MFCCs are more discriminative that the coefficient from the central part of the MFCC feature vector. The future work on generic sound detection will be oriented toward application of GA on wide range of various spectro-temporal audio features to get more clear answer to the feature selection problem [5].

3. PROPOSED OF WORK

The clap pattern based electrical appliance control is based on the patterns of claps. The claps are one, two, and three likewise devices can be ON and OFF. In this the specific time delay can be given to the microcontroller because by using this microcontroller can read the triggering pulses.

4. BLOCK DIAGRAM

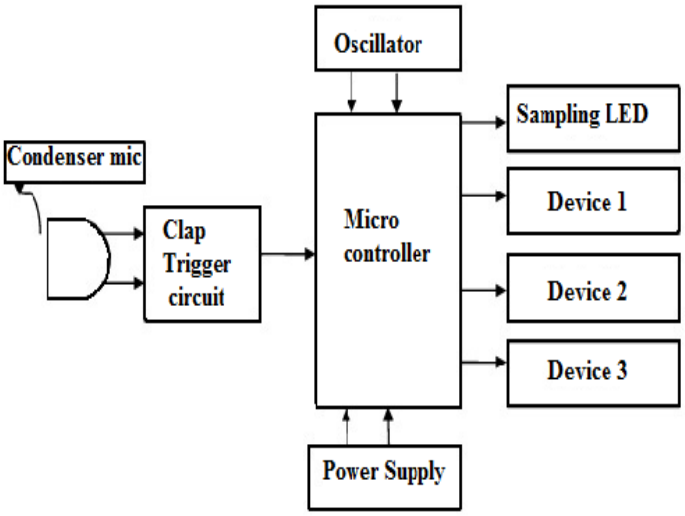

Fig-1: Block Diagram of Clap Pattern Based Electrical Appliance control

- The above system consists of following blocks:

1. PIC microcontroller
2. IC 555 timer
3. Condenser MICROPHONE
4. Sampling LED
5. Power Supply
6. Oscillator

4.1 PIC microcontroller:-

In this block diagram we used the PIC18F2550 microcontroller it is a 28 pin IC. It has a flash type program memory. Here we used the 256 prescalar for the delay purpose.

4.2 Audio Amplifier:-

When we clap our hands, sound is captured by audio amplifier. This sound is converted into the electrical signal and then it is amplified by using transistors.

4.3 Condenser Microphone:-

A microphone is an acoustic-to-electric transducer or sensor that converts Sound into an electrical signal.

4.4 Monostable flip-flop:-

Mon stable multivibrator is known as one-shot multivibrator, is a pulse generator circuit in which the duration of the pulse determined by the R-C network, connected externally to the 555 timer. In such a vibrator, one state of output is stable. For auto triggering at output from quasi stable state to stable state energy is stored by an externally connected capacitor to reference level. The time taken in storage determines the pulse width. The transition of output from stable state to quasi stable state is accomplished by external triggering.

4.5 Sampling LED:-

For sampling led some specific time delay is given which is 4 sec is for on time and after every 4 sec it takes 5 sec delay.

4.6 IC 555 timer:-

It works as square-wave form generator with duty cycle varying from 50 percent to 100 percent, Oscillator and can also provide time delay in circuits.

4.7 Oscillator-

Oscillator is used to generate audio and radio frequency energy. And the output of the oscillator sine wave output. It has many shapes like square wave or saw-tooth wave. The sinusoidal waveform in the form of ac or dc. Oscillator is a very low power devices use in a radio frequency circuits. Electronic oscillator related with a both produce sinusoidal electrical energy. Output of the oscillator on a frequencies measure in tens of a megahertz or the output produce of a special oscillator at microwave frequencies. Oscillator actually generates radio frequency output in the low power transmitter most basic form.

5. FLOWCHART

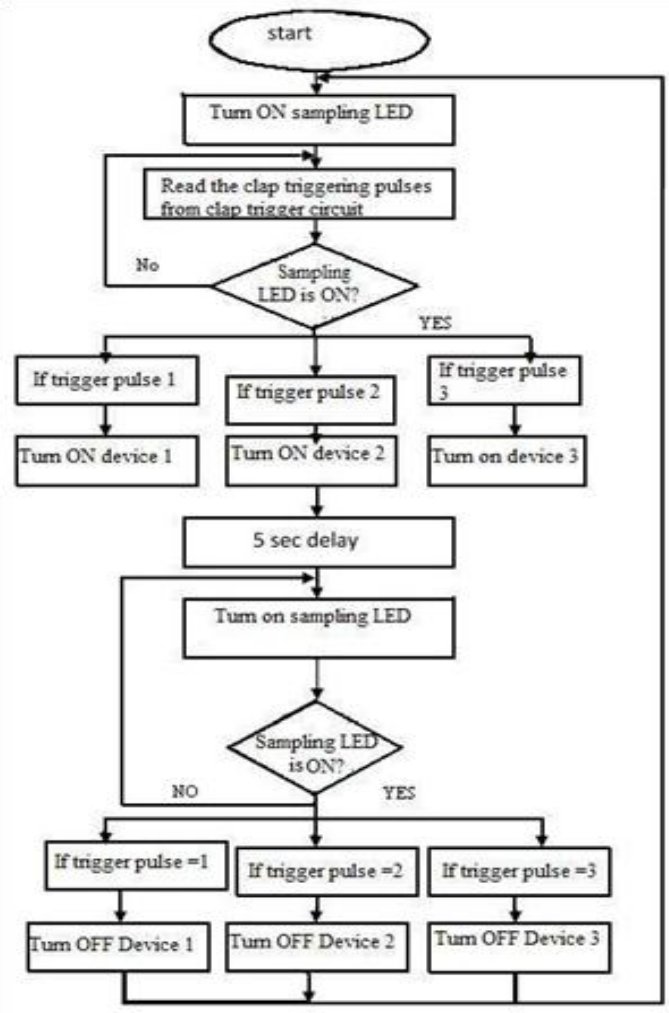

Fig-2: Flowchart of Clap Pattern Based Electrical Appliance control.

In above flowchart, when sampling LED is turn ON then micro-controller will read clap triggering pulses from clap trigger circuit. And when the sampling switch is OFF, then it will check the triggering pulses coming from timer. When triggering pulse is one then it will turn ON the first device. When triggering pulse is two then it will turn ON the second device. When triggering pulse is three then it will turn ON the third device. When sampling LED is ON then again it will read clap triggering pulses from clap triggering circuit. When all devices turn ON then it takes 4 to 5 sec delay.

When we want to OFF all devices, then it will again check the sampling LED is ON. And if the sampling LED is ON then it will checks triggering pulses. It will only OFF the already ON devices. When triggering pulse is one then it will OFF the first device. When triggering pulse is two then it will OFF the second device. When triggering pulse is three then it will OFF the third device.

6. CONCLUSIONS

The main objective of this project is to design system to ON OFF electrical appliance. Traditional clap switch control the only one device, which is tedious and inefficient. By using this, we can control multiple electrical appliances. The resulting device is realizable, has good reliability and it is relatively inexpensive. This project is useful for handicap person.

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