

# Design of Arduino based external impulse generator (pacemakers) for heart

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**Abstract :** [1]Temporary cardiac treatment consists of the use of a pacemaker which is an electrical device to assist your heart to beat periodically. The pacemaker is connected to your heart by wires. The pacemaker uses wires to provide the cardiac electrical impulses, if any malfunction in heart so that the heart beat continuously by the electric signals. The emergency pacemaker is portable. [1]various types of pacemaker have been designed from implantable, external (transvenous endocardial or transthoracic myocardial p) and Console battery- or AC-powered cardioverters. The simplest pacemaker is Console Pacemakers in which uses external electrical stimulus by electrode plates or subcutaneous needles applied to the skin of the chest. This paper has explained the design of external pacemaker using Arduino having battery powered, portability and low cost.

**Keywords -** Arduino, external pacemakers, ECG.

## I. INTRODUCTION

Normally, every heartbeat is started by an electric signal in your heart, causing the muscle of the heart to squeeze. In order to control your heart rate, temporary pacemaker may be used when The pathways with electronic signals in your heart are damaged by heart attack. [7]Until your damaged paths heal, temporary pacing may be used, A pathway is permanently impaired by illness or ageing, Until you can get a permanent pacemaker, temporary pacing can be used, An irregular cardiac rhythm results in a "short circuit" of your heart, The irregular heartbeats are also slightly devastating, Temporary heart rate control can be used until medicines are in place for the problem, You have a heart gap and require a couple days of support in maintaining the cardiac rhythm regular. This paper has explained the design of external pacemaker using Arduino having battery powered, portability and low cost.

## II. METHODOLOGY:

In this design we use the following hardware

1. Two Arduino uno
2. Two AD8232 Heart Rate Monitor

Below figure is proposed design of external pacemaker:

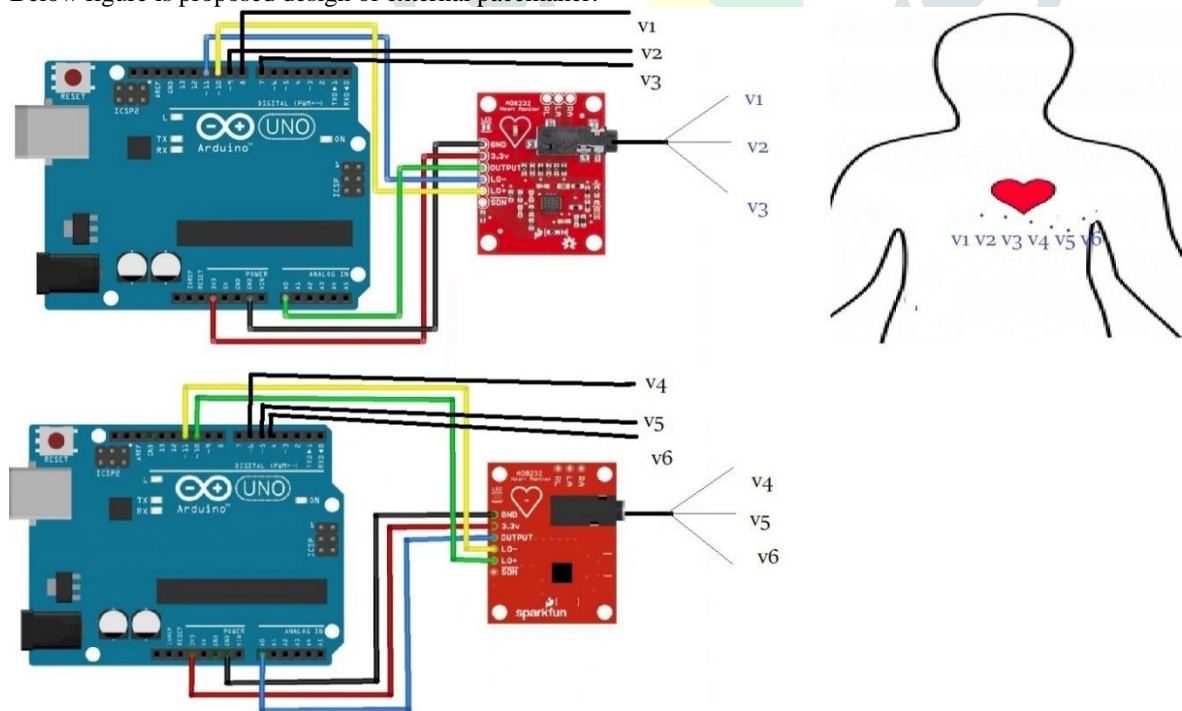


Figure 1. Experimental design of external pacemaker

As per the design we are placing all the six electrodes at v1 to v6. Then after receiving signal from AD8232 Heart Rate Monitor into Arduino will generate electrical pulse if heart malfunctioning occurs to heart from v1 to v6 wire which attached to Arduino pin from 9 to 4 and from v1 to v6 places to heart.

### III. RESULT:

Till now every ecg acquisition using Arduino is done only based on 3 electrode at RA, LA and RL position but in this paper we have given the design placement of 6 electrode from v1 to v6 as the doctors used to read from professional ecg machine. Also, whatever the places we will get anomaly we are simply giving electrical pulses to that place automatically to support the heart.

### IV. CONCLUSION

With the use of 6 lead ecg we can acquire professional and detail ecg to easily understandable by doctor that automate the electric pulse generation to heart in case of any malfunction / failure. Its having great benefit to end user because of its portability , battery operated with low cost which is life saving in emergency situation and provide time to access profession healthcare support.

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