

Flexible bio-signals channels acquisition system for ECG and EMG application

ABSTRACT

Each nerves and muscles of human body will generate potentials, voltages, and electrical field strength and known as bio signals such as electrocardiograph (ECG), electromyography (EMG), electroencephalogram (EEG), and electrooculogram (EOG). The signals may be acquired through non-invasive surface Ag/Ag Cl applications although the generated signals exist in very low levels of voltages. All the bio signals may be obtained from basic designs of instrumentation amplifier with the help of Ag/Ag Cl electrodes. However, different frequency band, interference, amplitude and strength may give huge challenges to the acquisition system. This paper provides instrumentation amplification design, include with the design concept to allow for flexible channels. There are lots of advantages from the proposed design such as minimal additional cost for additional channels used and circuit design modification or replacement. To suits bio-signals frequency bandwidth need, digital filter design in Labview software is added, as a part of acquisition system and to discard unwanted signals outside frequency bandwidth.. For now, the design is able to demonstrate to acquire two bio-potentials signals; ECG and EMG signals.

Keyword: Acquisition system; Flexible channel; ECG; EMG