

ABSTRACT

Muscle fatigue is a condition that occurs after a strong and prolonged muscle contraction, in which the muscle is no longer able to contract for a certain period of time. This fatigue can also result from overexertion but abnormal fatigue can also be caused by restriction or interference with different stages of muscle contraction. The purpose of this study was to analyze the use of TENS in muscle fatigue by monitoring EMG signals so that differences in muscle conditions can be monitored directly. TENS can aid the healing process by returning damaged muscle tissue to a normal state, which will result in pain reduction and consequently the prevention of muscle fatigue and other improved outcomes. The design of this tool consists of a voltage rectifier circuit, an intensity regulator, the intensity selection, and the SSR module. The data from the measurement results that have been taken has the maximum average error value of 0.12% for Frequency in Continuous Mode, for Frequency in Burst Mode it has the maximum average error value is 0.251%, while for Current has the maximum average error value of 10.1%. Based on the results of testing on patients, the results of the questionnaire test showed that there was a decrease in the level of fatigue between the test with the TENS method and the rest method, so it can be seen that the effect of using TENS can restore the performance of muscles experiencing muscle fatigue.

Keywords: TENS, EMG, Muscle Fatigue, Microcontroller, Arduino Uno