

ABSTRACT

DESIGN AND IMPLEMENTATION SYSTEM ELECTROMYGRAPH SENSOR AND BUCK CONVERTER USING ADC SIGNAL PROCESSING

The activity of the muscles of the human body generates an electrical signal, which is produced by muscle contraction and relaxation. Information carried by electric signals can be observed in the need for analysis of muscle activity, muscle abnormalities and muscle fatigue. Significant electrical signal information can improve the quality of data, therefore it takes a sensor that can capture muscle signals in a longer time.

Thus, for this purpose a low-power Electromyograph (EMG) sensor is designed as one solution. Implemented by limiting the consumption of EMG sensor power using switch mode power supply (SMPS) and decrease sampling in ADC with modification of received signal. The study was conducted through 12 variations of testing each volunteer. Volunteers who took biceps muscle signal consisted of 3 students aged 20 to 22 years. Testing is divided into four observation objects against 1, 2, and 3 cycles of contraction until relaxation. Benchmark as a comparison of data to SMPS, sleep mode, and SMPS with sleep mode.

The result of benchmark test on SMPS obtained a decrease of power equal to 89,37%. Benchmarks to sleep mode decreased power by 16,33%. The last test benchmark against sleepmode and SMPS of 82.97%.

Keywords: *electromyograph, switch mode power supply, analog to digital converter, power.*