Design of a wireless surface EMG acquisition system

ABSTRACT

Wireless Technology plays a significant role in current world. Many applications use wireless sensor network for health monitoring. One of the examples is the application to measure muscle response or electrical activity in response to a nerve's stimulation of the muscle. The development of wireless Electromyography (EMG) for remote monitoring of muscle activities is one of many vital parts in the biomedical technology. This wireless EMG is able to transmit signals through wireless transmission to computer for monitoring. By employing this technology, doctors treating patients with muscle complication can monitor their patients from the comfort of their office while the patients roam freely in their own room or therapy room. This technology is essential for patients with needs of home-based monitoring and economical medical services. The design of wireless EMG system comprises of a preamplifier and an electrode for the measurement of EMG signal, main amplifier for signal processing, DSP processor for A/D conversion and X-Bee module for wireless transmission. During power spectral density, EMG signal is distributed between 10 to 500Hz. Thus, EMG signals become consistent with the application of wireless transmission.

Keyword: EMG system; Wireless EMG; Health monitoring; A/D conversion; Surface electrodes