DESIGN AND DEVELOPMENT OF LOW COST MICROCONOLLER BASED ECG SYSTEM FOR REALTIME ANALYSIS

ARPITCHOUDHARY, MOHIT KUMAR, KUNDAN KUMAR, RACHANA SINGH, SAPNAKATIYAR

A.B.E.S. Institute of Technology, NH-24, Vijay Nagar, Ghaziabad ,UP, India

ABSTRACT

The ElectroCardioGram (ECG), a set of graphs of electrical heart activity, is the principle toolused in diagnosis of different heart conditions. This paper illustrates the design andimplementation of a low-cost ECG monitor using microcontroller and MATLAB. The objective of this system is to acquire the analog ECG signal in digitized form which is observed on a PC for storage and further analysis. This is achieved by a embedded system based hardware acquisition unit synchronized with MATLAB software for automatic data storage in files. The ECG signal is captured using disposable ECG electrodes and the heart rate in beats per minute will be displayed on a LCD. The ECG signal is sampled at a rate of 941KHz and after digitization, fed to a microcontroller-based embedded system to convert the ECG data to a RS232 formatted serial bit-stream.This serial data stream is then transmitted to a Personal Computer at a rate of 9600 kbps. In addition to this the ECG signal can also be viewed on a digital storage oscilloscope (DSO).

KEYWORDS: ECG, Microcontroller, MATLAB, ADC, Serial Communication, Bio-Potential Amplifier