

## **A Physiological Signal Monitoring System based on SOC Platform**

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### **Abstract**

A wireless network based physiological signal monitoring system which integrates a System on a Chip (SOC ) platform and Bluetooth wireless network technology has wide-ranging applications in the field of medical homecare technology as well as remote monitoring of patients.

The system is constituted of three parts including mobile sensing unit, Bluetooth module and website monitor unit. Firstly, we can use acquisition sensors for physiological signals, an MCU as the front- end processing device, and several filter and amplifier circuits to process and convert signals of electrocardiogram (ECG) , body temperature and heart rate into digital data.

Secondly, a Bluetooth module can be used to transmit the digital data in wireless manner to the SOC platform, which can be utilised, as a web server additionally, to detect the body temperature and heart rate of the person whose health is to be monitored. If feasible, in future it can be extended to monitoring more physiological signals such as the respiratory rate, blood pressure and EEG. The acquired physiological signals could be displayed on a web page or collected into a nursing centre in real- time through RJ- 45.

For the system architecture the major components being used are sensors, one being the AD-590 temperature sensor for body temperature monitoring and the other being AD 620 for ECG monitoring for a simplified model which can later be replaced by biomems and biosensors for precision and compact structure, thermistors, electrodes, Bluetooth wireless transmitter, micro controller unit comprising of PIC 16F877, RJ-45, filters, and an SOC platform using Xilinx Spartan -3 (SP3).

Thus, the various acquired physiological signals could be monitored and it is possible to reduce the manpower based nursing load .This will open up new insights for future applications in medical homecare technology as well as remote monitoring of patients within a clinic. It can also possibly be used in villages as a mobile health monitoring system using hand held computers and

health monitoring devices, which will be a boon making medical facilities accessible to one and all.