# Wireless Medical Monitor Network

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## Background and Overview

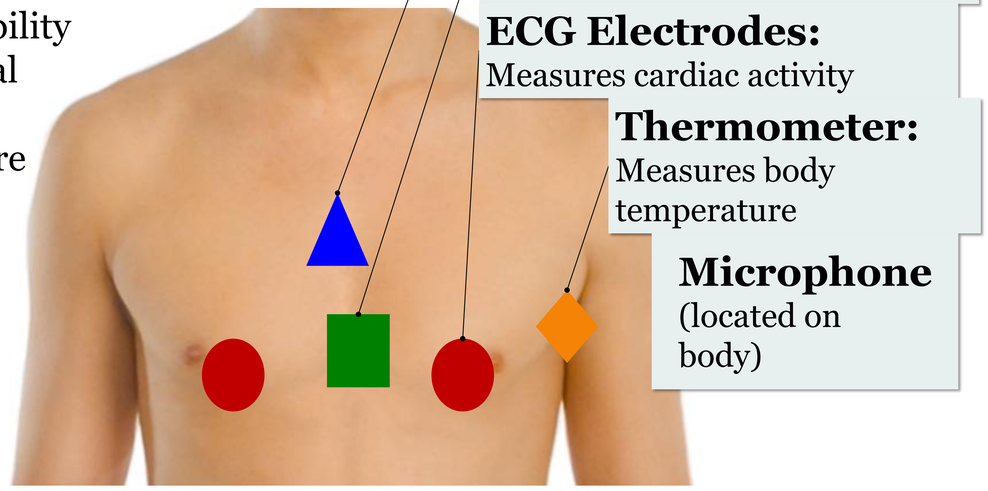
Medical instrumentation has many inconveniences associated with it. Our system addresses some of the major weaknesses by wirelessly monitoring vital signs.

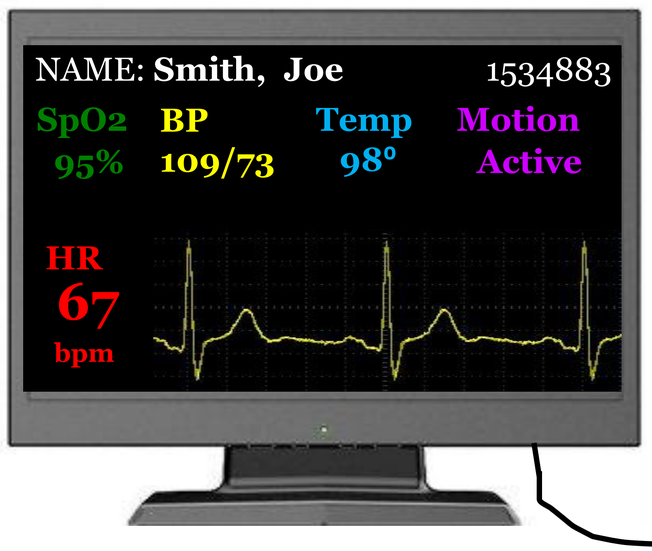
## Applications & Issues Addressed

•Military – Battlefield soldier vitals and mobility
•Hospitals – Patient vitals and bulky hospital equipment
•Children and Senior Citizens – In-home care and increased patient mobility

## Device Description

This device measures cardiac activity (ECG), oxygen saturation, blood pressure, body temperature, and motion level readings and wirelessly transmits these signals to a base station for remote monitoring.




Base Processing Unit & FPGA

## Signal Analysis

### ECG

Uses Discrete Wavelet Transform (DWT) to detect cases of Ventricular Tachycardia and Ventricular Flutter. Also used to detect pulse.

### Accelerometer

3-Axis moving average power calculation and orientation threshold.

### Blood Pressure

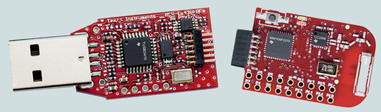
Uses the delay between ECG QRS wave and SpO2 waveform for calculating the velocity of blood through arteries in order to find the blood pressure.

### Voice Recognition

Uses time-warping and Mel filtering to compare voice input and stored voice commands.

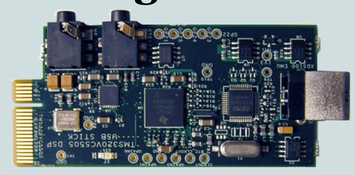
## Process Flow

1. **Signals from sensor array**
2. **Conditioning circuitry**
3. **Body processing**
4. **Wireless transmission**



RF2500
Uses multiplexed Analog to Digital signals to sample biometric data, and transmits them using SimpliciTI wireless protocol

5. **Base processing unit**



C5505
Acquires the digital signal processes the signal with algorithms we designed, and sends to FPGA.

6. **Display via VGA**
The data from the C5505 microprocessor is transferred to the Spartan-3 FPGA to display the vital information by utilizing the VGA port on the FPGA.

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