

Wireless Electrocardiogram(ECG/EKG) System --WECGS

Group 9

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Customers

- Hospitals
- Health and Fitness industry
- Medical Industry
- Field Monitoring Systems

Project Narrative

Traditionally electrocardiography (ECG/EKG) consists of recording electrical activity of the heart over a period of time using electrodes connected by long wires. The objective of this project is to eliminate the need of a wired connection between the electrodes and display through the use of wireless transmission. The elimination of wires will allow for data acquisition and display in more dynamic and diverse settings than conventional EKG devices. This also creates a safer environment by eliminating the risk of contamination from old bacteria covered wires. The objectives are to create a low power, accurate, wearable, wirelessly transmitting device that processes and displays user EKG data through either a mobile app or other display mediums. A signal will be extracted from the user via a series of leads attached at key points along the body, the signal will then be wirelessly transmitted and processed into useful data displayed for the user. The goal is to achieve an end product that is reliable and creates an easy experience for the user in settings not normally ideal for wired EKGs. Desired customer requirements consist of a safe, durable, lightweight, low power, rechargeable product that can operate under normal medical conditions.

Specification Requirements

Related Standards

Dimensions	50mm x 50mm x 15mm (LxWxH)	
Power and Transmitter Runtimes	Lithium-Ion polymer with Micro USB Charging	12 Hour Runtime

Weights	Each Electrode with transmitters 16gs	
Operating Conditions	10-40C	25-75% humidity
Storage Conditions	-20 - 50C	25-75% humidity
ECG Channels	2 Channels	
Frequency	.1 to 50hz	
Sampling rate	200 samples per second	
Sampling Resolution	16 Bit	

Android App

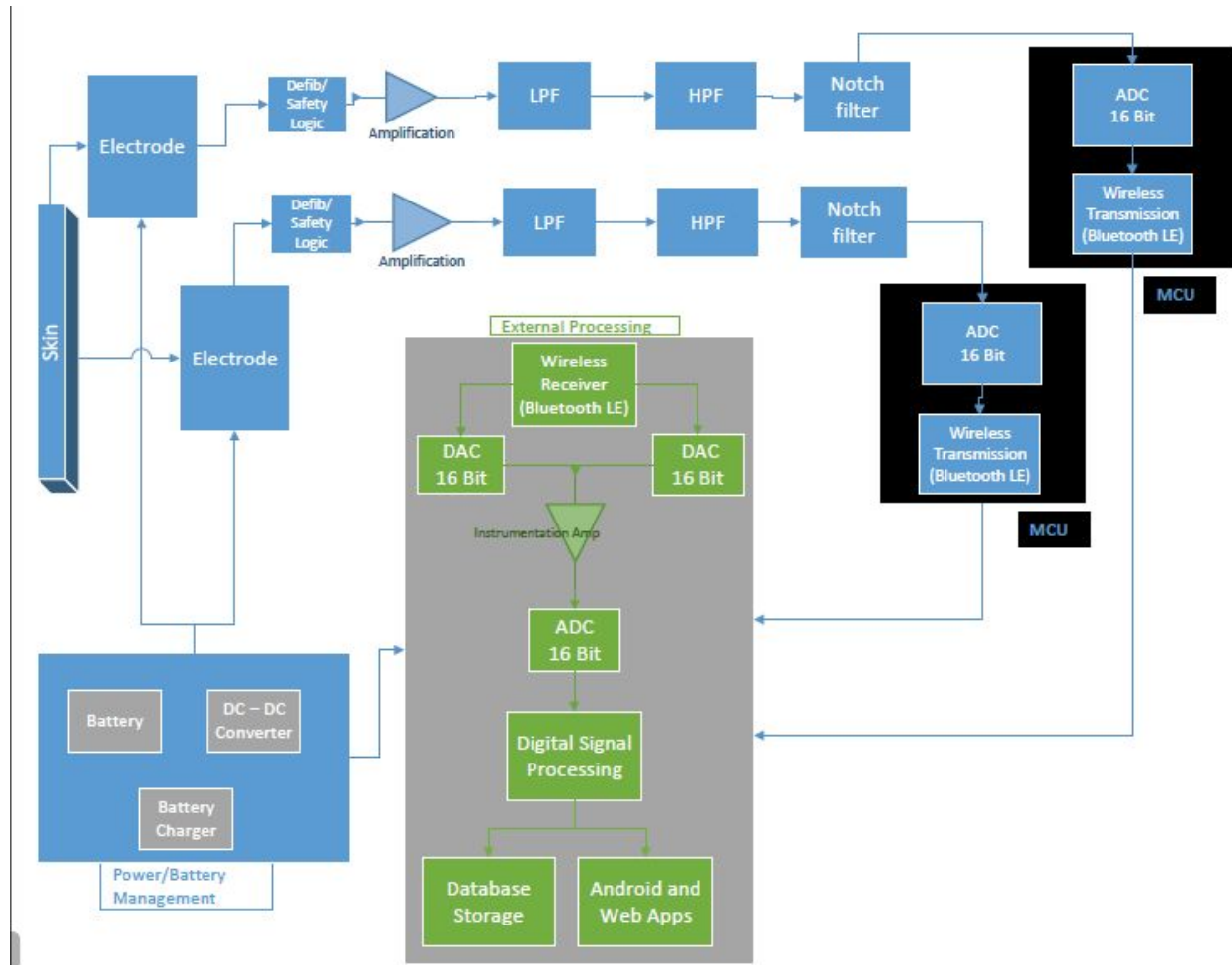
- This will include a visualization of the EKG
- The ability to save the data in the cloud
- The ability to stream the EKG data from the wireless device
- Must comply with HIPAA requirements

Networked database

- Must store EKG and user data
- Must comply with HIPAA requirements

Block Diagram

(Every Block in Design Stage)



Budget

Estimated Total: \$ 600

Sensor(x2)

Power/ Battery Management: \$10

Defib/Safety Logic: \$20

Signal Conditioning Stage: \$15

Microcontroller:\$50

Bluetooth Transmitter:\$20

Electrode:\$20

Receiver/External Processing

Power/ Battery Management:\$15

Bluetooth Receiver:\$30
DSP: \$30
Instrumentation Amplifier:\$10
ADC: \$15
DAC(x2): \$50

General Construction

PCB Prototyping x3: \$150

Overhead : \$30