Quick Notes

BioCapture™: Acquiring ECG data
Electrocardiography (ECG) is a recording used to examine the electrical activity of the heart. BioCapture uses surface electrodes to monitor the rhythm of heart muscles as they contract and expand. There are several practiced ways of acquiring an ECG signal. This quick note will demonstrate a basic 1-channel ECG recording.

**What you will need**

- **BioRadio User Unit**
- **USB Bluetooth adapter** (optional)
- **3 cloth surface electrodes** (P/N 040-0026, pkg of 30)
- **Nuprep skin prep gel***
- **3 high performance foam snap electrodes** (optional P/N 040-0038, pkg of 60)
- **3 “button snap” electrode cables** (any color, P/N 116-3045-R, pkg of 5)
- **Shielded lead electrode cable** (optional, P/N 502-0189)
- **Alcohol wipes***

**Need to re-order supplies?**
Contact your local Sales Representative, call 1-855-GLNeuro (855-456-3876) or e-mail sales@glneurotech.com

**Set up**

Using an alcohol wipe and skin prep gel, prepare the surface of the skin where the electrodes will be placed by gently abrading and then wiping clean the area. Make sure the skin is dry before placing the electrodes.

*If sweating occurs, the cloth surface electrode contact will diminish and you may have to repeat this process in order to ensure sufficient skin/electrode contact.*

With you or a participant standing up and relaxed, place two cloth surface electrodes, approximately six to seven inches apart, just below the collar bone (clavicle). See figure on the next page for details.

Place a third cloth surface electrode left or right hip bone (iliac crest). This will be the ground electrode.
Connect any color “button snap” electrode cable to each cloth surface electrode.

1 channel ECG hook up

Connecting electrode cables to BioRadio User Unit

Connect the electrode cables to the first differential input, Ch1, on the BioRadio User Unit.

For an accurate ECG signal display, plug the left electrode into the black input of Ch1, and the right electrode into the red input of Ch1.

Connect the hip bone (‘Ground’) electrode cable to the GND input of the User Unit.

To prevent interference from encroaching ECG signal data, twist or bundle together any dangling cables, or tape any dangling cables to the skin with medical tape.
Configuring your BioCapture system

With BioCapture launched and your BioRadio turned on, connected and ready for use, press Device Config, from the tool bar to configure the BioRadio for one channel of ECG.

From the Device Config window, select Differential, enable Channel 1 ['Ch1'], type in ECG for a custom name and select the ECG option under the Type drop down box.

Ensure that all other inputs are disabled. For the this demonstration, Sampling Rate can remain unchanged.

For further reading on Sampling Rate, Resolution and Input Range, please refer to the BioCapture Owner’s Manual.

Press Program Device to program your BioRadio.

Acquiring ECG data

Your BioCapture system should now be ready to collect one channel of ECG. Please note that the ECG configuration option presets the following display properties: y-axis max/min, custom filters, gain and offset.

With arms at rest and relaxed, press Start Acquisition from the tool bar to begin acquiring data. A small data trace will appear.
You may need to access the Y-Axis Set Max/Min option for a more prominent ECG signal display. The ECG hardware configuration option sets a display range of ±12 mV. You can auto-scale all signals by pressing Ctrl + A or by selecting View > Auto-Scale Signals.

**ECG, heart rate and exercise**

Unlike most physiological signals, ECG consists of a particular and recurring set of electrical activities. These activities, displayed in millivolts, consist of a P wave, a QRS complex, and a T wave. A heartbeat is a cardiac cycle that creates these waves and complexes.

Performing any kind of aerobic exercise will cause the heart muscles to work more quickly. During and after light exercise the ECG signal display should show more heartbeats – sets of P waves, QRS complexes and T waves – per minute.

The heartbeat’s electrical cycle represents heart muscles—arteria and ventricles—that contract and expand, creating periodic changes of each muscles’ electrical state in the process.

The heart rate is the inverse of the time in between any P wave, QRS complex, or T wave. For example, if the time measured between two QRS complexes is 0.8 seconds, then the number of beats per second is the inverse, 1.25 beats per second. In order to obtain the heart rate, you would simply multiply by 60 seconds per minute. This would yield 75 beats per minute.
Ready. Set. Go!
You are now familiar with an essential ECG recording. For further reading on ECG, please refer to the BioCapture Owner’s Manual and/or the following references:


>a More complex ECG recordings can show specific electrical activity of certain heart muscles and special conductive tissues

HAVE QUESTIONS? NEED TECHNICAL SUPPORT? WE’RE HERE TO HELP.
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