

# The New BioEMG III

## Advantages

(1/2009)

### BioEMG III - miniaturization with enhanced performance (When compared to BioEMG II, the previous industry leader)

BioRESEARCH has released the BioEMG III amplifier. This amplifier has several advantages over the previous modes such as the ability to test your wires for connectivity, ground testing, and individual LED's to tell you that your lead wire is plugged in all the way.

Despite the fact that the BioEMG II was already the industry leader in common mode noise rejection we made several improvements that further reduce the susceptibility of the BioEMG III to interference. Noise reducing wires, better impedance, and channels that turn off when not in use all give improved common mode rejection of noise.

Best of all, BioRESEARCH has built this amplifier to be "legacy compatible." As a service to our customers we do not follow the industry convention of "planned obsolescence." The BioEMG III will work with all previous interface systems so you don't have to replace your entire BioPAK to upgrade your EMG amplifier! However, the current standard interface is high speed USB.

In addition to saving you money on your upgrades, this new EMG system also uses ½ the electricity of the previous version so you can save the planet, or at least on your electric bill.



## Amplifier Performance Specifications

### Input

<b>Type of amplifier</b>	Differential, fixed gain of 5,000
<b>Impedance</b>	$\geq 100$ GigaOhms ( $10^{11} \Omega$ )
<b>Range</b>	0 to 2000 microvolts (p - p)
<b>Noise (background)</b>	$\leq 0.1$ microvolt (average)
<b>Offset Range (allowed)</b>	-0.75 volt to +0.75 volt DC
<b>Common Mode Rejection Ratio (min.)</b>	$\geq 130$ dB at 60 Hertz ( $\geq 120$ dB, 30 to 500 Hertz)
<b>Signal to noise ratio</b>	1,000,000 to 1
<b>Common Mode Voltage Range</b>	-3.0 to +3.0 volts DC
<b>Bandwidth (all channels)</b>	30 to 1000 Hertz (@ 2,000 Hz sample rate)
<b>Sensitivity</b>	$< 1.0$ microvolt (p - p)
<b>Resolution of A/D converter</b>	0.03 microvolt (16 bits)
<b>Silent Period Measurement</b>	to nearest 1/2 millisecond

# **BIO EMG III New Features:**

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1. BioEMG III amplifier has increased noise rejection that sets a new industry standard
  - Increased CMRR (noise rejection) from 120 dB to 130 dB at 60 Hz (3.1 X)
  - Increased CMRR from 105 dB to 120 dB at 500 Hz (5.6 X)
  - Noise rejection is now 100 times better than Myo instead of only 30 times better.
  - Total noise rejection is 170 dB with NoiseBuster feature in BioPAK program!
2. Input impedance increased from  $10^9$  to  $10^{11}$  Ohms
  - Reduces “loading effect” for more accurate recording
  - Helps to reject noise
3. Shielded leads reduce noise from cell phones and all other sources
  - Radio frequency (rf) noise - radio, TV and cell phone towers require shielded leads to maximize noise rejection.
  - Notch filters are useless against rf noise sources
4. Channels are only on when lead is plugged in
  - Any unused channels will not pick up noise and feed it into adjacent channels
  - Unused channels do not draw power from the system
5. LED Indicator Lights show when leads are plugged in all the way!
  - Light comes on only when the lead is plugged in and connection is made
6. Separate JVA channels
  - BioEMG III is now has 10 amplifiers instead of only 8
  - JVA inputs = separate amplifiers that turn off when EMG channels turned on
7. Ground tester and lead tester
  - Now you can check your ground connection and verify that it is good!
8. Weight of amplifier box reduced from 7.5 oz to 5.8 oz.
  - Enhanced comfort for the patient
9. Power consumption reduced from 1.2 W to 0.6 W
  - Help save our planet!
10. Still *Legacy* Compatible with JT-3, PCI and PCMCIA Interfaces

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