

## EMG100C - Electromyogram Amplifier module

The electromyogram amplifier module (EMG100C) is a single-channel, high-gain, differential input, biopotential amplifier designed specifically for monitoring muscle and nerve response activity. The EMG100C is designed for use in the following applications:

Conventional bipolar EMG measurement

Biomechanics

Nerve conduction measurement

Muscular reflex studies

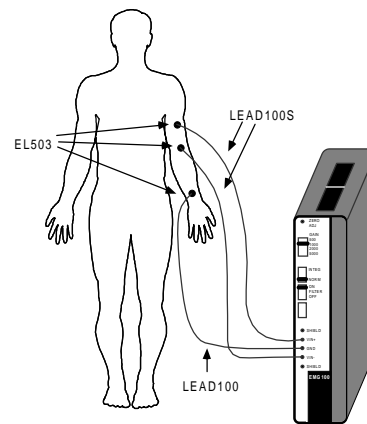
Motor unit potential measurement

The EMG100C will connect directly to any of BIOPAC Systems, Inc.'s series of Ag-AgCl lead electrodes. The best choice for electrodes depends on the application, but typically, the EL503 adhesive/disposable snap electrodes are used in conjunction with the LEAD110S pinch lead. If reusable electrodes are required, the EL508S is typically used; when using EL508S electrodes, you also need adhesive disks (ADD208) and electrode gel (GEL100). Use two shielded electrodes (LEAD110S/EL503 or EL508S) for the signal inputs and one unshielded electrode (LEAD110/EL503 or EL508) for ground.

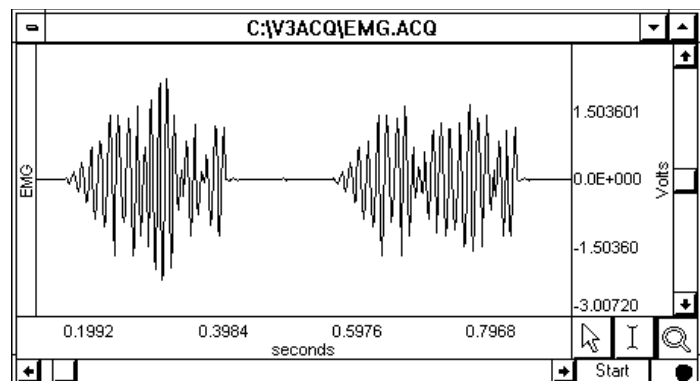
The EMG100C has built-in drive capability for use with shielded electrode leads. Shielded leads are typically required, as the EMG100C has a frequency response that extends through the 50/60Hz interference bands. The EMG100C is designed to pass EMG signals and signals associated with nerve responses.

The EMG100C incorporates a variety of filtering options to optimize the amplifier performance when recording from either surface or needle electrodes, and when recording from either muscle or nerves. For instance, when recording EMG (muscle) from surface electrodes, the 10Hz to 500Hz bandwidth setting could be used, but when recording nerve propagation times, the 100Hz to 5,000Hz bandwidth setting could be used.

Electrode connections to the EMG100C for the measurement of EMG activity from the arm biceps are shown.

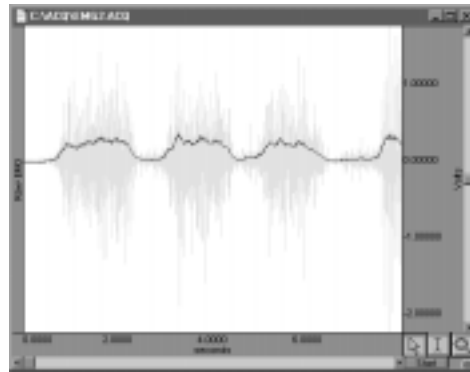


This graph shows a typical raw EMG recording. Waveform peaks indicate points of peak muscle activity.



This graph shows raw EMG and integrated EMG.

To integrate EMG in real-time, set up a calculation channel in AcqKnowledge using the **Integrate** function with **Rectify** checked **ON**. In this case, this waveform would be augmented by a smoothed curve following the positive envelope of the EMG signal.



### Frequency Response Characteristics

The 1Hz and 10Hz lower frequency response settings are single pole roll-off filters.

Modules are factory preset for 50 or 60Hz notch options, depending on the destination country.

See the sample frequency response plots beginning on page 186:

100Hz HPN option (with 50Hz notch enabled)	500Hz LP option
100Hz HPN option (with 60Hz notch enabled)	5000Hz LP

### EMG100C Calibration

The EMG100C is factory set and does not require calibration. To confirm the accuracy of the device, use the CBLCAL.

### EMG100C SPECIFICATIONS

Gain:	500, 1000, 2000, 5000	
Output Range:	±10V (analog)	
Frequency Response		
Low Pass Filter:	500Hz, 5000Hz	
High Pass Filter:	1.0Hz, 10Hz, 100Hz	
Notch Filter:	50dB rejection @ 50/60Hz	
Noise Voltage:	0.2µV rms - (10-500Hz)	
Signal Source:	Electrodes (three electrode leads required)	
Z (input)		
Differential:	2MΩ	
Common mode:	1000MΩ	
CMRR:	110dB min (50/60Hz)	
CMIV--referenced to		
Amplifier ground:	±10V	
Mains ground:	± 1500 VDC	
Input Voltage Range	<u>Gain</u>	<u>V<sub>in</sub> (mV)</u>
	500	±20
	1000	±10
	2000	±5
	5000	±2
Weight:	350 grams	
Dimensions:	4cm (wide) x 11cm (deep) x 19cm (high)	

*See also:* JUMP100C  
MEC series