

EBI100C Electrical Bio-Impedance Amplifier

The EBI100C records the parameters associated with cardiac output measurements, thoracic impedance changes as a function of respiration or any kind of biological impedance monitoring. The EBI100C incorporates a precision high frequency current source, which injects a very small (100 μ A) current through the measurement tissue volume defined by the placement of a set of current source electrodes. A separate set of monitoring electrodes then measures the voltage developed across the tissue volume. Because the current is constant, the voltage measured is proportional to the characteristics of the biological impedance of the tissue volume. The EBI100C measures both impedance magnitude and phase simultaneously. Impedance can be recorded at four different measurement frequencies, from 12.5kHz to 100kHz. For operation, the EBI100C connects to four unshielded electrode leads terminating in Touchproof sockets. The EBI100C is typically used with EL500 paired disposable electrodes, but can function with spot or ring electrodes, reusable electrodes, or needle electrodes.

For injecting current and averaging voltage at four paired-electrode sites (required for cardiac output measurements), use four CBL204 Touchproof “Y” electrode lead adapters (see page 183) and eight LEAD110 electrode leads with each EBI100C.

When using the EBI100C amplifier with other biopotential amplifiers attached to the same subject, it's not necessary to attach the ground lead from the biopotential amplifier(s) to the subject. The subject is already appropriately referenced to the subject via the attachment to the EBI100C. If a biopotential ground is attached to the subject, then currents sourced from the EBI100C will be split to the biopotential amplifier ground lead, potentially resulting in measurement errors.

Frequency Response Plots

The 0.05Hz lower frequency response setting is a single pole roll-off filter.

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: 10Hz LP

100Hz LP

EBI100C Calibration

For Cardiac Output Measurements

1. Set the EBI100C to a Frequency of 50kHz and a Magnitude Gain range of 5 ohms/volt.
2. Introduce a 20 ohm resistor between the I Out / Vin+ combination terminal to the I In / Vin- combination terminal.
3. Press the Cal1 button...
4. Introduce a 40 ohm resistor between the I Out / Vin+ combination terminal to the I In / Vin- combination terminal.
5. Press the Cal2 button....

EBI100C Specifications

Number of Channels:	2 – Magnitude (MAG) and Phase (PHS)
Operational Frequencies:	12.5, 25, 50, 100kHz
Current Output:	100 μ A (rms)— constant sinusoidal current
Outputs:	MAG of Impedance (0-1000 Ω) PHS of Impedance (0-90 $^\circ$)
Output Range:	\pm 10V (analog)
MAG Gain Range:	100, 20, 5, 1 Ω /volt
MAG LP Filter:	10Hz, 100Hz
MAG HP Filter:	DC, 0.05Hz
MAG Sensitivity:	0.0015 Ω @ 10Hz BW
PHS Gain:	90 $^\circ$ /10 volts
PHS LP Filter:	100Hz
PHS HP Filter:	DC coupled
PHS Sensitivity:	0.0025 degrees @ 10Hz BW
CMIV -- referenced to	
Amplifier ground:	\pm 10V
Mains ground:	\pm 1500 VDC
Signal Source:	Electrodes (four electrode leads required)
Weight:	370 grams
Dimensions:	4cm (wide) x 11cm (deep) x 19cm (high)