MODEL 2122 / 2122i BIOAMPLIFIER



UFI 545 Main Street, Suite C-2 Morro Bay, CA 93442

Introduction

The Model 2122 is a differential amplifier for use with lowlevel signals -- 2 microvolts and above -- ranging from DC to 10 KHz. Primarily designed as biological instrumentation, the Model 2122 is well suited to many other demanding applications. It features high commonmode rejection, high input impedance, low noise, small size, and excellent frequency response. The Model 2122i includes subject isolation, but is otherwise identical to the standard Model 2122. A BioAmplifier Input Box with convenient binding post terminals is an included accessory.

Controls and connectors



Power switch

 Connects power supply to BioAmplifier; should be left in OFF position when instrument is not in use.

Amplification switch

• Provides 16 fixed-gain settings; Model 2122 frequency response does not change with gain.

High- and low-frequency rolloff switches

• Use these controls to filter out undesirable or interfering signals. Here are recommended settings for various bioelectric signals:

Desired signal	Low freq (Hz)	High freq (Hz)
EKG	0.1	50
EEG	1.0	50
EMG	10	1000
EOG	0.05	50

 0.05 Hz and 0.1 Hz settings have long time constants; Model 2122 may require 30 seconds to stabilize when first turned on with these settings.

Calibrate µV switches

 Active circuit generates symmetrical square waves at about 0.5 Hz, and may be used to test amplifier at any time.

- Press 500 μV switch to disconnect signal and feed 500 μV calibration to Model 2122 input.
- Press 50 μV switch to disconnect signal and feed 50 μV calibration signal to input.
- Calibrator voltage is usually accurate to 5%.
- Bioamplifier may require rebalancing when calibrating.

Balance adjust control and meter

- Since the Model 2122 responds to frequencies as low as DC (0 Hz), you'll need to adjust this control when a signal has a DC (offset) component.
- Connect transducer, set amplification to 100.
- Adjust 10-turn balance control in direction you meter needle to move: clockwise for higher reading, counter-clockwise for lower.
- Balance control can compensate for some offset due to electrode polarization potentials: 100-150 mV offset for gains of 200-1000; 10-15 mV offset for gains of 2000 to 10,000.
- If meter cannot be centered with balance control, input offset is excessive.
- To check for this, press 500 µV calibrator switch and adjust balance control. Meter needle should return to zero and fluctuate with calibrator pulses.
- If this is not possible, a) reduce amplification to x1000 or less; b) switch to AC position on Model 2122 Input Box; c) use better Ag/AgCI electrodes such as UFI Model 1081.

• To input a single-ended signal into Model 2122, ground unused differential Model 2122 input, then adjust balance control.

Power connector

- Model 2122 operates from 12VDC wall-mount power supply plugged into 110VAC mains.
- Use only UFI-supplied wall-mount supply others may have reversed-polarity connectors.

Input connector

 Model 2122 features a 6-pin input connector (viewed from rear, below); pin functions are:



Pin	Function
А	+ Signal (non-inverting)
В	+9V excitation through 10K
С	Signal ground
D	Excitation ground
Е	- Signal (inverting)
F	Driven shield

- Energize high-resistance strain gauges (like UFI Models 1030 and 1040) or similar full-bridge transducers with the +9V pin. A 0K resistor limits Pin B current to less than 0.7 mA.
- Driven Shield (Pin F) supplies buffered sum of inputs from Pins A and E; connect F to transducer shield for signal with large common-mode component.

BioAmplifier Input Box

- Plugs into Model 2122 input connector
- Connects wire-terminated transducers.
- AC switch position blocks DC component.

Rear-panel outputs

- 1000-ohm output impedance allows Model 2122 to drive oscilloscope or virtually any recorder.
- Use DC output for signals that require DC response like those from Models 1030/1040.
- Use AC output for bioelectrical signals such as ECG, EEG and EMG.
- Both outputs operate at all times: you can simultaneously record large-signal DC response and small superimposed "AC" variations.
- Both DC and AC outputs respond to amplification and high-frequency rolloff switches.
- Only AC output responds to low-frequency rolloff switch; it does not affect DC output.

Model 2122 specifications

Input impedance	10 megohms
Input connector	Switchcraft EN3P6F; fits EN3C6M plug
Freq response	DC to 10kHz +/- 3 dB
Frequency rolloff	-12 dB/octave
Common mode rejection	90 dB minimum

•	Noise	Less than 2 μ V peakto-peak, DC to 100 Hz with 10K Ω source
•	Output configuration	Single-ended
•	Output impedance	1000 ohms
•	Power supply	110 VAC-to-12 VDC wall-mount transformer
•	Power input jack	Switchcraft 722A; matches plug S-760

Model 2122i additional specifications

٠	Maximum isolation voltage	700 volts AC
•	Typical leakage current	<5 µA at 240 VA0

Warranty and repair

All UFI instruments are warranted against defects in materials and workmanship to the original purchaser for a period of one year from the date of original purchase. This warranty is void if our inspection shows the equipment has been tampered with; or installed at variance with factory-designated procedures; or has been subjected to negligence, misuse, or accident beyond normal usage; or has had the serial number altered, defaced, or removed.

No third party, including any dealer or agent, is authorized to assume any liability for UFI.

All questions regarding the warranty should be directed to:

Customer Service Department, UFI 545 Main Street, Suite C-2 Morro Bay, CA 93442 Email: ufi@ufiservingscience.com

When corresponding or communicating with UFI concerning your equipment, please include the model and serial numbers.

UFI instruments and transducers are subject to continuous improvement. We reserve the right to modify any design or specification without notice and without incurring any obligation.

ALL UFI TRANSDUCERS AND ELECTRODES ARE COVERED BY OUR EXCLUSIVE "LIFELINE® WARRANTY" AS OUTLINED BELOW

If your UFI transducer, electrode, or electrode tester ceases to operate--regardless whether the cause is accidental, intentional, or whatever---*return it to us*. We will repair it or replace it with a new one for a minimal handling charge, as listed below:

Model 1010, 1010C	\$25.00
Model 1020, 1020EC, 1020FC, 1110	\$25.00
Model 1030, 1040, 1070, 1081FT	\$50.00
Model 1081 & 1081 SNP	\$11.00
Model 1089 MK II & MK III	\$65.00
Model 1130, 1131, 1132	\$35.00
Prices subject to change	