

# BMA-400

## AC/DC low-noise 4-channel extracellular bioamplifier



### APPLICATIONS

- Extracellular recording
- EMG, ECG, ENG, EEG, etc.
- Single-unit and multi-unit nerve recordings
- Head-stages available for Hi-Z electrodes

The BMA-400 AC/DC Bioamplifier is a low-noise, four-channel instrument for amplifying EEG, ECG, EMG, and other extracellular biopotential signals. It features very low noise, a wide gain range, and sharp cutoff bandpass filters. It can be used as a stable DC amplifier, and includes adjustable DC input offset controls.

The BMA-400 features a high-impedance differential amplifier front-end, for the lowest noise and best rejection of spurious signals. Gain is adjustable from 10X - 50,000X, extensible to 500,000X with optional head-stages, making it possible to resolve microvolt level signals with ease.

A TTL logic input controls stimulus passing through the recording electrodes. This stim/record input, as well as the four channel outputs, are connected to a multi-pin connector on the rear panel for convenient cable con-

nections.

### STANDARD FEATURES

- Wide gain range, 10—50,000X
- Very low noise & high input impedance
- Sharp cutoff high and low-pass filters
- DC response with adjustable input offset

Four shielded input cables are provided, terminated with standard 1.5mm DIN sockets. A range of electrode lead-wires are available (needle, snap, etc.). Unwired input plugs are available for fully custom electrode configurations.

Applications for the BMA-400 Bioamplifier include multi-channel EEG, EMG, and other extracellular biopotential measurements. Head-stages are available for high-impedance electrodes or custom recording applications, including the ISO-Z isolated head-stage.



*Feline diaphragm EMG*

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### SPECIFICATIONS

Input type .....	Differential
Input range for full-scale output .....	$\pm 100\text{mV} - 0.5\text{V}$
Input impedance .....	$>10,000$ Megohm
Noise, referred to input .....	$<5\mu\text{V}$ P-P, wideband
Common Mode Rejection .....	$>95\text{dB}$
Gain range .....	10X - 50,000X, 12-positions
Low-pass filter .....	100Hz - 50kHz, 6-positions
High-pass filter .....	DC - 100Hz, 6-positions
Filter type, slope.....	Butterworth, flattest response, -12dB/octave
Stim/record input.....	TTL
Input connections (rear panel) .....	Amphenol 703-91T-3478-009 7-pin
Output connections (rear panel) .....	BNC jack
Data port connector (rear panel) .....	25-pin D-SUB female
Power available at input connectors (for transducers or head-stages) .....	$\pm 12\text{V}$ @ 50mA
Power requirements.....	115/230VAC, 10VA
Dimensions .....	12W x 4H x 9D inches, 30 x 10 x 23 cm

*Note 1: Not to be used for human life support applications.*

### ORDERING INFORMATION

<b>Part No.</b>	<b>Model:</b>	<b>Description:</b>	<b>Applications:</b>
09-03010	BMA-400	AC/DC 4-channel bioamplifier	EEG, ECG, EMG biopotential recording
10-02030	HS-1	High-impedance X1 head-stage	Use with microelectrodes
10-02020	ISO-Z	Isolation amplifier head-stage	Electrically isolated recording
10-02010	SUPER-Z	High-impedance head-stage	X10 gain with calibrator
09-03112	ICA-400	Input cable, one channel	Pre-wired cable, 9' with 1.5mm DIN sockets
10-02064	NEE-3	Needle electrode leads, set of 3	Subcutaneous or intramuscular recording
10-02063	E422	Snap-type electrode leads, set of 3	Use with pre-gelled ECG or EMG electrodes
10-02066	D-482	Pre-gelled disk electrodes, pk of 150	Surface recording of ECG, EMG
10-02065	Alligator	Miniature alligator clip leads, set of 3	Simple skin connections, for ECG, etc.

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