

# Model 1800

## Microelectrode AC Amplifier



The Model 1800 AC Microelectrode Amplifier is a two-channel, differential amplifier configured for use with headstage probes. The instrument is intended for extracellular recording and/or stimulating in conjunction with high impedance metal microelectrodes. Ideal for single-cell spike recordings, it can also be used in a number of research or teaching applications requiring extracellular neurophysiological recording from excitable tissue such as nerve, muscle (EMG), EEG, EKG, and ERG recordings.

Each channel of the Model 1800 contains a high-gain, low-noise differential amplifier stage followed by low-frequency, high-frequency, and notch filters. Three operating modes are available to accommodate recording, stimulating, and verification of electrode impedance. Multiple gain settings and simultaneous current measurements during stimulation are provided. An internally calibrated current source allows *in situ* verification of electrode impedance.

The Model 1800 Headstage includes a mounting rod and bracket for a standard micromanipulator and a complete set of miniature electrode cables.

Common applications for the Model 1800 Microelectrode AC Amplifier include, but are not limited to:

- Single Cell Action Potentials
- EEG / EMG / EKG / ERG recordings
- Evoked Potentials
- Multiple-Unit Recordings
- Long-term Potentiation
- Waveform Sorting

The Model 1800 Microelectrode AC Amplifier is designed for research grade recording quality, with a straightforward interface that also makes it ideal for teaching applications.



x10 Headstage Probe

- Two amplifiers in one instrument
- Can record from or stimulate through electrodes without changing connections
- Fixed Gain: x100, x1000, or x10,000
- Low noise
- Notch filter for power line frequency
- *In situ* electrode impedance measurement
- Current monitor during stimulation
- Includes rack mount hardware
- 3-year warranty

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### Application

#### Notes:

1) recording  
EEG and spikes  
simultaneously

The Model 1800 Microelectrode AC Amplifier was designed to record from two different electrodes simultaneously. Recently, many users have requested the ability to record both spikes and EEG/Evoked potentials from the same electrode simultaneously. A-M Systems can modify the Model 1800 circuitry to accomplish this task. The output from the Channel 1 headstage is routed internally to the input to the Channel 2 circuitry. The same signal can then be filtered at different settings by the Channel 1 and 2 filter stages. Contact A-M Systems, or your distributor, for more information.

2) Automated control  
of instrument MODE

The Model 1800 Microelectrode AC Amplifier can both record from the electrode, or pass externally generated current to the electrode, without requiring the user to change the connections at the headstage. To do so, the user must set the MODE switch on the front panel to REC or STIM. A-M Systems can modify the 1800 to allow a computer or other instrument to send a TTL level signal to control the 1800's mode, allowing for a faster and more controlled switching between recording and stimulation modes.

### Specifications

Gain*	x100, x1000, x10000
High Pass Filter*	0.1, 1.0, 10, 100, and 300 Hz; -40 dB / decade
Low Pass Filter*	500, 1000, 5000, 10000, and 20000 Hz; -40 dB / decade
Notch Filter	>-25dB at 50 or -30dB at 60 Hz.
Noise	1.0 microvolt p-p typical (10 Hz to 10,000 Hz)
Common Mode Rejection	> 80 dB
Input Impedance	>100,000 megohms
Low Input Bias Current	(± 3 pA typical)
Other Features	Can pass stimulation current direct to electrodes Built-In current monitor during stimulation <i>In-situ</i> electrode impedance measurement (up to 40 megohms)

\* Can customize these values for an additional fee. Contact A-M Systems or your distributor for information

### References

Kwon, JT and Choi, JS. (2009) Cornering the fear engram: Long-term synaptic changes in the lateral nucleus of the Amygdala after fear conditioning. *J Neuroscience* 29(31): 9700-9703

Aflalo, T and Graziano, MSA (2006) Partial tuning of motor cortex neurons to final posture in a free-moving paradigm. *PNAS* 103(8):2909-2914

Cator et al. (2009) Harmonic Convergence in the Love Songs of the Dengue Vector Mosquito. *Science* 323 (5917):1077-1079

### Ordering Information

For use on 220 V / 50 Hz power systems: Product #700005 *Country-specific power cords are not supplied.*

For use on 110 V / 60 Hz power systems: Product #700000

Two Product #700500 Headstage probes *must* be purchased at time of ordering for proper operation of the instrument.

All units include a product manual and rack mounts.

### Distributed By:

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