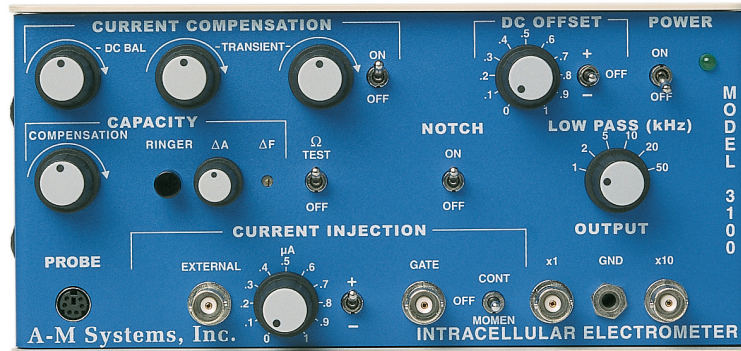


Model 3100

Intracellular Electrometer



The Model 3100 Intracellular Electrometer is a simple to use, low cost intracellular amplifier. Current compensation includes a dual-transient control that provides extremely precise adjustments to transient suppression during membrane recordings. The DC balance control eliminates the need for an external bridge or a differential input oscilloscope. The DC offset provides electrode offset control up to $\pm 1V$. An internal square-wave generator supplies a 100Hz current pulse to determine electrode resistance. Capacity compensation can adjust up to 35pF of electrode capacitance. Additional stray capacitance can be reduced by using the driven shield connector on the head stage probe.

The Model 3100's uses an advanced capacitance "Ringer" for clearing electrode tips and enhancing the membrane penetration of neurons. The Ringer's amplitude and frequency of the pulsed oscillations sent to the electrode can be adjusted. Low pass filtering combined with a line frequency notch filter are available for the researcher to diminish extraneous frequencies and external line noise.

The current injection system allows for both internally generated and externally generated current. This current can be set for continuous or momentary injection. The sum of the current can be gated by an external TTL logic signal source. The small size of the amplifier and its remote power supply offers the advantage of placing the amplifier near to the experimental set up. For example, the amplifier can be placed within a Faraday cage with minimal power-line interference.

Common applications for the Model 1600 Neuroprobe Intracellular Amplifier include, but are not limited to:

- Intracellular recording of single cell action potentials
- Current Clamp
- Dye Injection
- Ultra-low noise extracellular recordings

The Model 3100 Intracellular Electrometer is a cost effective research grade instrument that can easily double for teaching applications.



Headstage Probe

- Square-wave generator for testing electrode resistance and capacitance compensation
- Simultaneous stimulating and recording by a single electrode
- Transient and DC balance controls
- Low-pass and Notch filters
- Gated external current input
- Electrode impedance measurement
- Adjustable ringer
- Small size allows placement within a Faraday cage
- Includes rack mount hardware
- 3-year warranty

Model 3100

Intracellular Electrometer



Application

Notes:

extracellular recording of action potentials

While the Model 3100 Intracellular Electrometer was designed to record intracellularly, many researchers utilize the Model 3100 in their extracellular recordings. The high input impedance of the amplifier results in extremely low noise recordings. The output of the Model 3100 Intracellular Electrometer is then routed to an additional gain amplification stage and perhaps a high pass filter before ultimately being recorded by a digitizing data acquisition system. For more information, contact A-M Systems, or your distributor.

Specifications

Noise (10Hz - 50kHz)	18 μ V, rms shorted; < 350 μ V with 20 Megohm source
Input impedance	10^{13} ohms; capacitance adjustable to zero
Bias current	Adjustable to zero
Voltage gain	x1 and x10
Capacity Compensation	-4 pF - 35 pF
DC Offset	± 1 V
Max internal current	1 μ A
External current	100 nA/V; 10 V maximum
Electrode test	100 Hz, 10 nA; (i.e. 10 mV/Megohm electrode resistance)
Ringer	0 - 10 V biphasic, 2 - 8 kHz

References

Suadicani SO et al. (2009) Point mutation in the mouse P2X7 receptor affects intercellular calcium waves in astrocytes. *ASN Neuro* 1(1):55-63

Lowe GC, Luheshi GN, and Williams S (2008) Maternal infection and fever during late gestation are associated with altered synaptic transmission in the hippocampus of juvenile offspring rats. *Am J Physiol Regul Integr Comp Physiol* 295: R1563-R1571

Ordering Information

For use on 220 V / 50 Hz power systems: Product #920005 *Country-specific power cords are not supplied.*

For use on 110 V / 60 Hz power systems: Product #920000

One product #920500 Headstage probe *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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