

**INTRACELLULAR**

**EXTRACELLULAR**

**PATCH CLAMP**

**STIMULATION**

**NEUROSCIENCE &  
ELECTROPHYSIOLOGY  
INSTRUMENTATION**



**A-M SYSTEMS™**



# Isolated High Power Stimulator

## Model 4100



## Model 4100 Isolated High Power Stimulator: the new standard for stimulation instrumentation.

The Model 4100 Isolated High Power Programmable Stimulator is our most powerful, flexible, and convenient single-channel stimulator. Perfect for a wide variety of applications, including optogenetics and field stimulation, the Model 4100 is designed to be your lab's workhorse stimulator, delivering maximum performance at a fair price.

### POWERFUL

$\pm 200$  V pulses at 100 mA

### FLEXIBLE

Monophasic, Biphasic, Ramp, & User-Defined waveforms

### CONVENIENT

Front Panel, Windows®, Apple®, LabVIEW™, MATLAB®, & Android™ compatible

### AFFORDABLE

Built-in isolator eliminates need for an additional external SIU

The 4100 can deliver stimulus trains comprised of monophasic, biphasic, and ramped waveforms. The 4100 can also scale and isolate any unique, custom, or biologically generated signal you can provide.

The 4100 can provide pulse durations between 1  $\mu$ s and 25 hours long. The 4100, with its built-in memory, can easily deliver traditional protocols such as LTP/LTD stimulation studies, Paired Pulses protocols, and Stepped Pulses with a single trigger pulse.

## Isolated Pulse Stimulator

### Model 2100

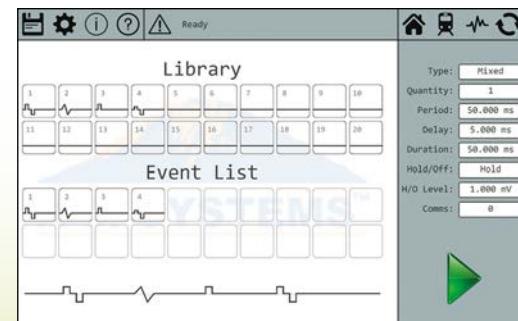


- Pulse width from 1  $\mu$ s to over 15 minutes
- Excellent timing accuracy! Better than 0.02%
- Monophasic or biphasic pulse outputs
- Optically-isolated; No separate stimulus isolator required!
- TTL sync outputs, triggering & gate

OPTOGENETICS   FIELD STIMULATION   BEHAVIOR  
INSTRUMENT SYNCHRONIZATION   LESION MAKING

- Complete computer control
- Line-Powered: No batteries required
- Internal isolation: No external SIU required
- Accepts arbitrary waveform inputs

### Software Control



## Analog Stimulus Isolator

### Model 2200



- Constant current or constant voltage
- Can isolate any input waveform shape
- Maximum output  $\pm 50$  V Biphasic (100 V monophasic), or 5 mA
- Uses rechargeable batteries; charger included

# MultiStim 8-Channel Programmable Stimulator & Optional SIU

## Model 3800



The Model 3800 MultiStim 8-Channel Programmable Stimulator is a highly flexible, programmable pulse generator that can produce independent, complex pulse trains on 8 channels simultaneously. When combined with its optional SIUs, the Model 3800 can produce scaled, isolated constant current or constant voltage pulses.

## Model 3820



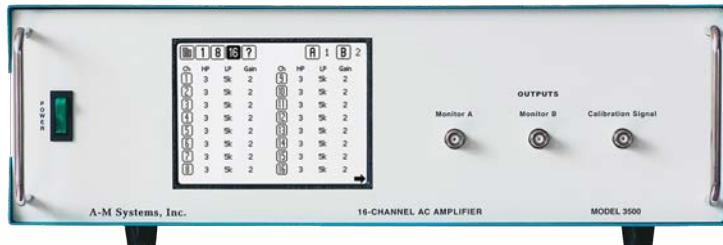
- Touch-screen or computer control
- Pulse Widths: 1  $\mu$ s – 250 hours;  $\pm 10$  V amplitude
- Monophasic / biphasic, paired & stepped pulse protocols
- Combine channels for custom protocols

### With SIU:

- $\pm 60$  V at 20 mA
- Constant Current or Constant Voltage
- Single SIU can produce biphasic pulses

## 16-Channel Extracellular AC Amplifiers

### Model 3500 and Model 3600



The Model 3500 is a true differential amplifier perfect for studies such as EEG and EKG.

The Model 3600 utilizes a 16-channel headstage to enable spike recordings using high-impedance electrodes.

## Model 3500 & Model 3600

- 16 independent high-gain, low-noise channels
- Control via front panel touch screen or Windows program
- Parameter sets stored on board and/or on a PC
- Built-in Output Monitors & Calibration Signal
- High Pass, Low Pass, and Notch Filters
- TTL Control

Model 3600	Model 3500
<ul style="list-style-type: none"><li>• Two headstage options for use with high impedance electrodes<ul style="list-style-type: none"><li>» Stimulating and recording headstage</li><li>» Miniature record-only headstage</li></ul></li></ul>	<ul style="list-style-type: none"><li>• True differential, common reference or ground reference recording options</li><li>• Can pass stimulation signals directly to electrodes</li></ul>

## Microelectrode AC Amplifier

### Model 1800



- Two independent channels
- Includes two headstages
- Recording gains: x100, x1,000, or x10,000
- Low noise (2.5  $\mu$ V peak-to-peak max., 10 Hz–10 kHz)
- High-Pass, Low-Pass and Notch Filters

## Four-Channel Differential AC Amplifier

### Model 1700



- Four independent channels
- Recording gains: x100, x1,000, or x10,000
- 2.5  $\mu$ V rms noise max (10 Hz–100 kHz)
- High common-mode rejection
- Optional headstage available

## Patch Clamp Amplifier

### Model 2400



- Full-featured amplifier with voltage and current clamp modes
- Capacity, series resistance, and whole cell compensation
- Telegraph outputs for all major front panel controls
- Displays command potentials, cell currents, and voltages
- Dual-range low-noise resistive feedback headstage (1 GΩ/10 MΩ; 10 GΩ/10 MΩ; 10 GΩ/100 MΩ)

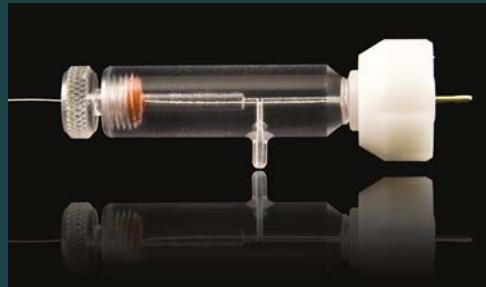
## Neuroprobe Intracellular Amplifier

### Model 1600



- Digital meter displays membrane potential, injected current, or electrode resistance
- Square-wave generator for electrode test and adjustment of capacitance compensation
- Current injection system allows simultaneous stimulating and recording by a single electrode

## Microelectrode Holders



Straight, Axon Universal Connector  
with Silver Wire & Suction Port



Straight, BNC Connector  
with Silver Wire & Suction Port

- Axon Universal, Axon Legacy, BNC, and 2 mm pin connectors
- Silver wire or Silver/Silver chlroride pellet
- With or without suction ports
- With or without perfusion ports
- Straight, 30°, 45°, or 90°
- Custom holders can be made to your design!

## Intracellular Electrometer

### Model 3100



- Low noise
- Input impedance:  $10^{13} \Omega$
- Bias current: adjustable to zero
- DC balance with transient suppression circuitry

## Audio Monitor

### Model 3300



- Two input channels
- 6-band frequency equalizer for custom sound performance
- 3 gain settings
- Headphone jack

## AC/DC Amplifier

### Model 3000



- Differential or single-ended recordings
- DC and AC modes
- Optional headstage for use with high-impedance electrodes
- High-Pass, Low-Pass and Notch Filters

## Bipolar Suction Electrode



### With Built-In Shielding

- Bipolar
- Easy pin connectors for connection to amplifiers
- Large internal volume
- Use with glass capillary pipettes, disposable pipette tips, or small diameter tubing
- Accepts capillary glass with OD between 1.2 mm – 1.5 mm

## Optopatcher®



### Fits All Patch Clamps, Including Axon and Heka

- Unmatched accuracy in applying optical stimulation to an in-vivo patch-clamp protocol
- Simultaneous patch-clamp recording and optogenetic activation through the same electrode
- Designed for glass diameters of 1.2 mm to 2.0 mm
- Optical fiber connects to any source cable terminating in a 1.25 mm ceramic ferrule

## Wire & Rod



A-M Systems offers a wide variety of fine bare, fine insulated wires, and straightened rods for your electrode manufacturing needs. We also have the ability to provide custom diameters and lengths of any item for your unique applications.

Need a custom size or length? Just ask us!



Wires	Bare Wire	Insulated Wire	Straight Rod
Gold	0.001" – 0.005"	0.001" – 0.005"	—
Platinum	0.001" – 0.005"	0.001" – 0.005"	0.001"
Platinum-Iridium	0.001" – 0.005"	0.002" – 0.005"	—
Silver	0.001" – 0.025"	0.001" – 0.025"	0.001" – 0.005"
Stainless Steel	0.002" – 0.020"	0.002" – 0.010"	0.001" – 0.010"
Tungsten	0.001" – 0.020"	0.002" – 0.010"	0.002" – 0.010"

## HumBug Noise Eliminator



The HumBug Noise Eliminator from Quest Scientific removes line frequency noise from electrophysiological signals without filtering or requiring ongoing user attention. That means more time getting results, and less time solving continuously evolving noise and ground loop problems.

## Connectors



## Electrodes



- Epoxy-Insulated
- Parylene-Insulated
- Suction Electrodes
- Ag/AgCl Electrodes

## Capillary Glass



- With or Without Filaments
- Standard Borosilicate
- Patch Clamp Glass
- Thin-Wall Glass
- Multi-Barrel Glass

## Patch Cords



## Illuminators



## Dental Cement



A-M Systems is a leading manufacturer of high-quality, precision neuroscience and electrophysiology instrumentation and supplies for the research community worldwide. Since 1976, our unwavering commitment to product excellence, competitive prices and customer service has earned us satisfied customers in more than 100 countries.

We design, manufacture and distribute a wide range of scientific instruments, including stimulators, intracellular and extracellular amplifiers, and patch clamp amplifiers. Leading universities and research institutions use our instruments and accessories to perform ground-breaking investigations into learning and memory, Alzheimer's and Parkinson's diseases, and models of stroke, deafness and blindness.

A-M Systems' most important value is supporting its customers, the primary researcher. We routinely customize our instruments and accessories to meet the individual requirements demanded by state-of-the-art investigations. If you do not see exactly what you are looking for, please contact us with your modification requests.

A-M Systems complies with ISO 13485:2016 and is committed to producing and delivering innovative, high-quality products and services efficiently and affordably. To learn more about how A-M Systems can help you meet your research objectives, contact us today.



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