Tecella Pico

USB-powered Miniature Patch Clamp Amplifier

Pico is a feature-rich, low-noise patch clamp amplifier with an integrated digitizer and headstage. Pico is ideally suited for whole cell (Vclamp and Iclamp) and single-channel (patch, planar lipid bilayer and synthetic nanopore) recording, as well as cellular electrochemistry.

- **Fully featured 1-channel amplifier**
- **USB powered**
- **Voltage Clamp and Current Clamp**
- **Series resistance compensation**
- **Multiple capacitance compensations**
- **Very small size**
- **Integrated headstage and digitizer**
- **Under 1 Watt power consumption**
- **Low Noise**

Clean Head Switching™ technology allows software controlled switching between voltage clamp and current clamp, or between multiple feedback resistors, without introducing any artifacts. This enables one Pico to support a wide range of applications including Whole Cell, Single Channel, Multi-Cell, Bilayers, Electrochemistry, and Current Clamp.

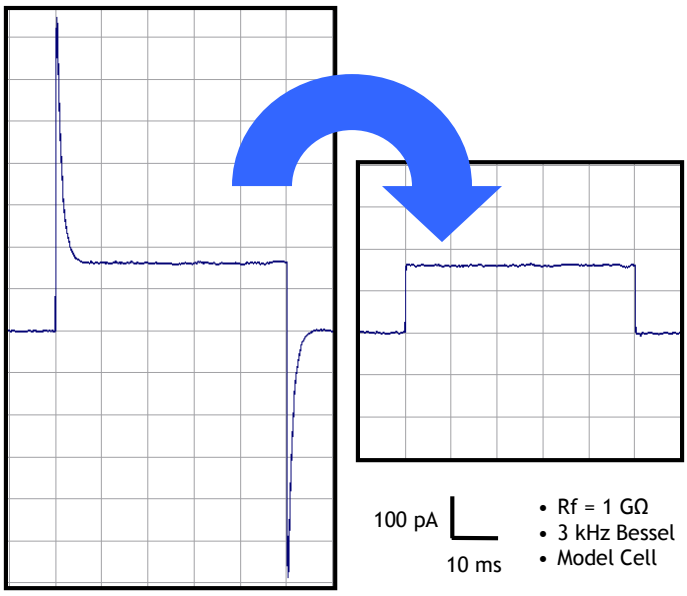
In voltage clamp mode, the Pico provides 5 feedback gain resistors ranging from 10 MΩ to 10 GΩ. In current clamp mode, the Pico provides 3 range settings from ±2 nA to ±200 nA.

Internal Model Cell allows for self calibration of the experiment setup, as well as, rapid post-experiment amplifier validation.

Software support for the Pico includes TecellaLab acquisition software and WinWCP software. Additional 3rd party software support is planned in the near future. SDK / API is provided for custom development and system integration.

RMS noise is 1 pA at 1 GΩ gain setting.

The Patented Spread Frequency Compensation can automatically compensate any arbitrary capacitance profile in approximately 3 seconds.



USB cable is all that is needed to power-up, control, and record from the Pico.

One BNC-type electrode holder is included with the Pico. Any BNC-type electrode holder can be used with the Pico.

Sutter Instruments, Siskiyou, and NeoBiosystems provide hardware to mount the Pico directly onto their micro manipulators.

Accessories

Included

USB Cable

Electrode Holder

Break-Out Box
for Triggers and
External DAQ Interface

Specifications

Integrated Digitizer	20 kHz sampling rate 16-bit A/D (18-bit internal resolution) Stimulus voltage ranges: ±250 mV ±2000 mV Zap voltage range of ±1000 mV
Feedback Gain Settings	10 MΩ, 100 MΩ, 1 GΩ, 3.3 GΩ, 10 GΩ
Low RMS Noise (DC to 3kHz)	0.3 pA @ 10 GΩ, 1.0 pA @ 1 GΩ, 7 pA @ 100 MΩ
Filters	Programmable 2-pole Low-Pass Filter (analog hardware circuit) Digital Filter available in TecellaLab software
Compensations	Up to 4 Capacitance Compensations Cfast x 1, Cslow x 3 0-100 pF per compensation Series Resistance Compensation Offset Compensation (±250 mV) Optional Active Leak Compensation
Current Clamp	±2 nA range with 1.25 pA resolution ±20 nA range with 12.5 pA resolution ±200 nA range with 125 pA resolution
Break-Out Box (optional)	For controlling external devices via the Pico's integrated digitizer: Digital Out x 4 (For Triggers) For interfacing Pico to 3rd Party Digitizers (DAQs): Analog In Analog Out Gain Telegraph 2 Current Clamp Control signals - "Imode" puts Pico in I=0/Iclamp mode - "Iclamp" engages Iclamp mode Switch to enable 3rd Party Digitizer control
Computer Interface	USB
Software	WinWCP by the University of Strathclyde jClamp by SciSoft Company TecellaLab software, with Data Export to ATF, tab-formats SDK/API available Other 3rd Party Software support planned
Mechanical & Power	USB powered. Does not require a separate power supply. 5.8 in x 1.8 in x 0.7 in (14.5 cm x 4.6 cm x 1.7 cm) 3 ounces (85 grams)
Power Consumption	0.8 Watt

U.S. Patents 7,741,829
8,163,147
8,163,527

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