

nanoZ

Impedance testing for in vivo probes

- Rapid, precise impedance testing
- Automated electroplating modes
- 64 Channels for microelectrode arrays



Introducing the nanoZ

Multichannel microelectrode arrays for neuronal recording require testing of electrode site impedances to identify faulty sites, and conditioning of sites for effective microstimulation. Manual methods are labor intensive. The nanoZ was specifically designed for testing multichannel electrodes, and has several electroplating modes for automated impedance matching, site activation, and site re-juvenation. It uses very low test currents for in vitro or in vivo testing, and can accurately measure the impedances of a 64-channel electrode in just 15 seconds.

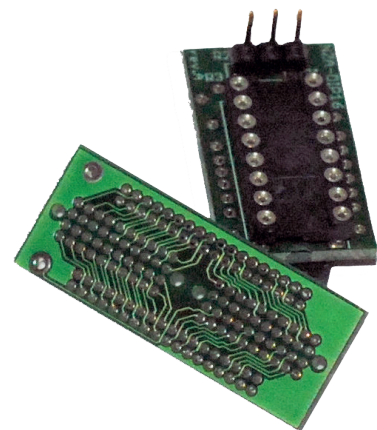


PC-based design

We designed the nanoZ to be flexible yet easy to use. The nanoZ requires no additional hardware other than a PC with a spare USB port. Simply plug the nanoZ into the computer, install the software suite, and you're ready to go.

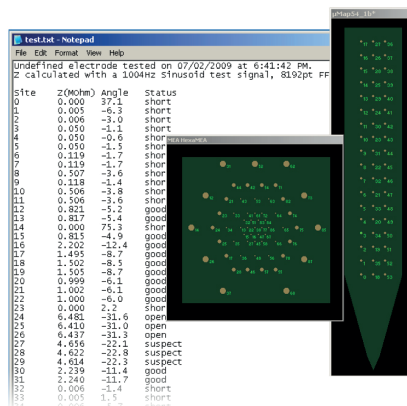
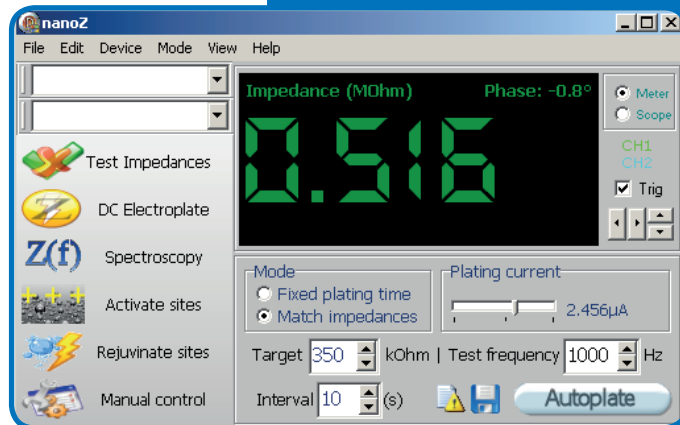
Adaptors for any electrode array

The nanoZ uses Samtec connectors that are pin-compatible with all 32- and 64-channel acute silicon probes from NeuroNexus. A DIP16 adaptor is included for use with 16 channel probes. Additional adaptors are available for using the nanoZ with dish MEAs from Multi Channel Systems, and we can also provide adaptors for commonly used connectors, such as Millmax and Omnetics. Channel mapping for different adaptors is handled transparently by the software.



Intuitive software suite

An intuitive user interface makes the nanoZ easy to use. In addition to manual operation, several fully automated modes are pre-programmed, including: whole-electrode impedance diagnostics, electrode impedance spectroscopy, electrode site cleaning/rejuvenation, and electroplating with precise control over current magnitude and time (e.g. for multichannel impedance matching, or delivering electrical current for lesioning or tissue marking). The test signals and electroplating waveforms are fully configurable. Virtual DMM and oscilloscope displays provide user feedback.

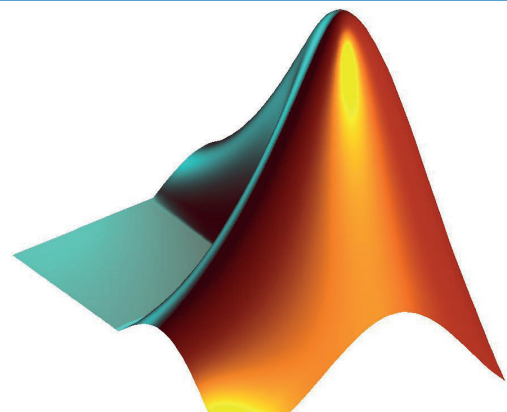


Programmable electrode site layouts

User-programmable electrode site configurations provide a meaningful way to visualize the integrity of the electrode array, and allow subsets of channels to be tested and/or conditioned by selecting the relevant sites with a few mouse clicks. Impedance data can be saved to file in standard ASCII formats for storage or further analysis in programs like Microsoft Excel or Matlab.

Matlab SDK

A software development kit for Matlab is supplied with every nanoZ, providing full access to the nanoZ's hardware and various modes of operation. So if the existing user application doesn't have the functionality you need, it is possible to write your own customized control and analysis tools. Several demo scripts are included to get you started.



Technical specifications

Hardware

Number of channels	64
Z measurement range	1 k Ω to 100 M Ω
Z accuracy & precision	1 k Ω display resolution 5 k Ω to 15 M Ω \pm 1 % (at test frequencies < 2 kHz) channels matched to within 1 %
Z test current	1 nA RMS (max), bias 50 pA (typical)
Test signals	default 1 kHz sinusoid waveform user-selectable frequencies from 1 Hz to 5 kHz arbitrary user-defined waveforms
Test speed	a 64 channel electrode takes 15 seconds to test
Electroplate mode	\pm 5 V compliance, constant current
Electroplate range	12 μ A
Electroplate resolution	100 nA
EEPROM	stores device-specific calibration values
PC interface	USB 2.0 (no external power supply required)
Connectivity	2 x 40 pin Samtec FOLC header optional adaptors for connecting any electrode 2.5 mm phono socket for external signal I/O
Dimensions	3.2 x 2.8 x 0.47 inches (81 x 70 x 12 mm)

Software

Operating systems	Windows XP, XP64, Vista or 7
Operating modes	Probe test, electroplate, impedance spectroscopy, site activation, site rejuvenation
Data export	ASCII file format
Matlab SDK (included)	

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