MICROSTIM-6

MicroStim-6 is a lightweight wirelessly controlled stimulus generator designed for neuroscience experimentation with freely moving animals.

Electrical stimulation

It has six electrical stimulus output channels. For most applications, the programmable electrical stimulus outputs produce constant-current pulsed stimuli, though constant voltage waveforms with zero or constant output resistance can also be obtained.

Audio and ultrasound

One of the 6 outputs can alternatively be set to generate audio waveforms, including ultrasonic frequencies, to generate audio stimuli using an external speaker or transducer.

Optical pulses for stimulation and optogenetics

Optical pulses for stimulation and optogenetics
Two output channels can alternatively be set to drive external LEDs or lasers to produce optical stimuli, or with appropriate light sources, light pulses for optogenetic experiments

Programmable waveforms

MicrosStim 6 is pre-programmed to generate cathodic balanced current pulses, but almost any waveform can be obtained by changing the software.

Wide range of signal amplitudes

The normal configuration can generate current pulses of 200µA amplitude programmable in steps of 0.1µA, but other current ranges are available on request. The voltage is up to 14V peak-to-peak.

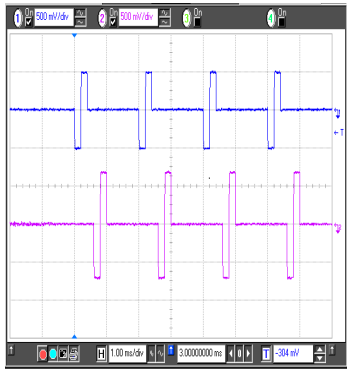
Long-distance radio link

The radio link is fully digital and has a range of at least 50 hundred meters in line-of-sight. In some countries, this may be extended to hundreds of meters

SPECIFICATIONS

Property	Value
Dimensions	L: 34mm; W:18mm H: 10.5mm
Mass	5.6g
Standard stimulus	Cathodic symmetrical constant-current
Current output range	0 to 200µA. Other ranges available up to 10mA
Current resolution	0.1µA
Timing resolution	5µs
Current accuracy	2.5%
Output impedance:	1MΩ typical in constant current mode
Output voltage range	14V p-p
Timing accuracy	0.004%
Number of outputs	Six: Any two can operate simultaneously
Audio output frequency range	10Hz to 100KHz
LED/Laser current	0 to 60mA
Transmitter connection	USB
Battery operation	2 hours continuous (Up to 10 hours with pulsed transceiver)
Host computer	PC: Windows 7, 8 or 10

Standard pulsed current waveform



Standard pulse parameters:
- ❑ Phase width
- ❑ Pulse period
- ❑ Amplitudes
- ❑ Output electrode
- ❑ Number of pulses

Custom wave-form generator
To customer specifications

FEATURES

Easily customized
MicroStim-6 is based on a powerful 32-bit ARM processor that allows features to be added or changed by changing software

Self-checking
Electrode impedance measurement
Battery voltage and charge state
Radio signal strength
Temperature sensor

Standard programmable pulse sequences
Unlimited number of pre-defined stimulus sequences

Electrode isolation
Electrodes that are not receiving stimuli are otherwise always electrically disconnected. This prevents electrode corrosion

Magnetic switch
On-off switch is magnetic. This allows fully waterproof housings where needed, and system can be switched on without touching animal

Rechargeable
The stimulator is powered by a rechargeable lithium battery so no batteries need to be replaced

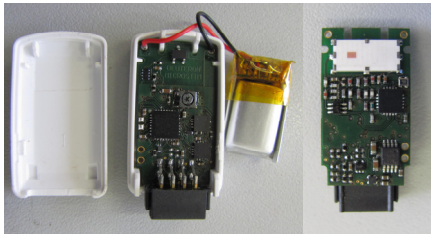
Custom stimulus waveforms
Arbitrary waveforms or standard waveform functions (sine, triangle ramp Gauss, etc)

Extra hardware functions
No two researchers need the same system: Deuteron Technologies can quickly produce custom variations to meet special needs

Transmitter
Compact USB radio transmitters included in all kits. Controlled by Windows based computer.

Software
A complete operation program is provided with each kit. No programming is needed to operate the stimulator. However, for automated experimentation, a fully documented function library is provided for programmers

Inside MicroStim-6



Above: Both sides of Microstim's 2-gram circuit board and its 1.6-gram battery. The white rectangle at the top right is the internal radio antenna.

COMPLETE KITS

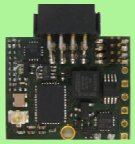
MicroStim 6 is supplied as part of a complete kit. Typically a kit will contain five MicroStim-6 stimulators, two USB radio transmitters, two chargers, antennas, cables and all the software and documentation needed.

Other animal stimulus products from Deuteron Technologies

Original design 4-channel with tough case for rats (15g)

Ultra-light 7-Channel for bats (1.2g) PCB

6-channel for rats with radio control for high-power LEDs



Synchronizing Transceivers

MicroStim-6 is controlled using a host PC connected to one of Deuteron's synchronizing radio transceivers. Model STX4 is Deuteron's standard synchronizing transceiver. It has 4 BNC inputs and one BNC output to allow connection, triggering and synchronization with other lab equipment.

About Deuteron Technologies

Deuteron Technologies Ltd is a company located in Jerusalem, Israel that specializes in electro-physiology equipment for use with freely moving animals.

Deuteron Technologies makes several models of wireless neural loggers, capable of recording up to 64 channels of neural data. Some neural recorders can also provide the same electrical stimuli as the MicroStim-6. All the neural loggers can be operated with the same synchronizing transceivers as the MicroStim-6

Deuteron Technologies Ltd
3 Hamarpe St. POB 45420
Har Hotzvim Science Park
Jerusalem 91451, Israel.
972-2-6235415, 972-528-895399
Email: info@deuterontech.com
www.deuterontech.com

Deuteron Technologies Ltd

Electronics for Neuroscience

MicroStim-6

Tiny wireless stimulus generator for freely moving animals

- **Electrical**
- **Audio**
- **Optical**