

# FNS-16 Neuromuscular Stimulator

Programmable 16-channel constant-current stimulation



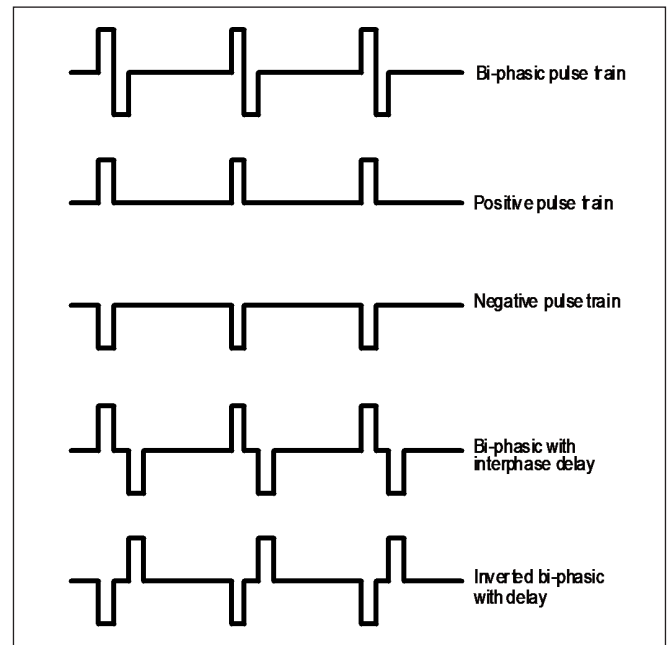
The FNS-16 Stimulator is a full-featured 16-channel stimulator for neuromuscular stimulation. It features fully programmable bi-phasic, constant-current waveforms, with user control of all timing, polarity, and current amplitude parameters. All outputs are electrically isolated for low noise and to prevent interference with adjacent recordings.

Each channel is independently programmable from the host PC using a standard RS232 serial interface. In addition, groups of channels can be simultaneously programmed, stopped, or started for synchronous multi-channel stimulation. Programming is accomplished using a simple string of command bytes provided by a LabView or VisualBasic control program (provided), or by custom-developed software. Programming a channel, or starting/stopping a stimulus program takes just a few milliseconds. This allows real-time, closed-loop stimulus control in response to recorded neural or muscular activity.

A wide variety of waveforms is possible, including single pulses, pulse trains of  $n$  pulses, or continuous pulsing.

A **MONITOR** port gives access to all timing and amplitude information for each of the sixteen channels. Separate logic and analog monitor signals are provided. These provide an exact representation of the stimulus

being delivered, but are galvanically isolated from the actual stimulus outputs. Stimulus outputs are provided using a single shielded connector box with sixteen BNC jacks. Comes complete with serial cable and CD containing Labview and Visual Basic software.



Examples of FNS-16 stimulus waveforms

## Standard Features:

- USB interface
- Full constant-current waveform control
- Fast programming and channel control

## Applications:

- Complex stimulation protocols
- Gait studies
- Closed-loop record/stimulation

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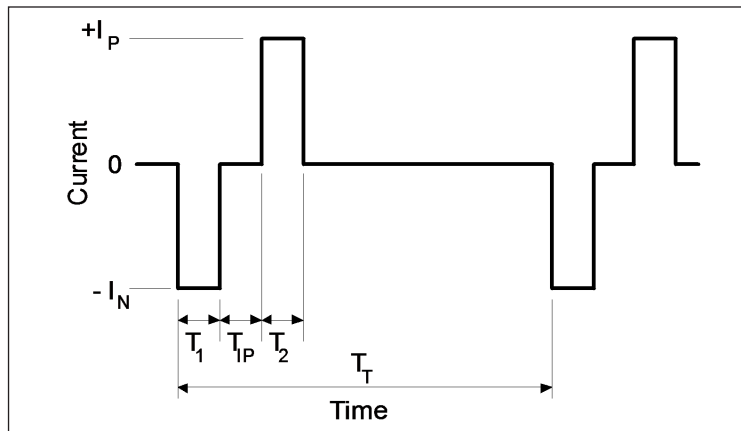
FNS-16a 10/04

# FNS-16 Functional Neural Stimulator

## Specifications: (Note 1)

Stimulus type .....	constant current, programmable
Current range .....	0 - $\pm 20,000\mu\text{A}$
Current resolution .....	1 $\mu\text{A}$ (16-bit accuracy)
Pulse frequency .....	0 - $>250\text{Hz}$
Timing range (all waveform parameters) .....	0 - 0.65s (10 $\mu\text{s}$ resolution)
Isolation voltage .....	1500V continuous, 2000V 10 sec
Leakage current .....	$<15\mu\text{A}$ , any output
Monitor output (analog) .....	0 - 5V (4000 $\mu\text{A/V}$ )
Monitor output (logic) .....	0 - 5V, TTL
Output connector box .....	16 x BNC, 6' cable
Power requirements .....	115/230V @ 50VA
Dimensions .....	19W x 3.5H x 12D in. (48x9x30cm)
Weight .....	10 lbs. (4.5kg)

*Note 1: This instrument is intended for non-human use only.*



### Programmable waveform parameters:

- $I_P$  = positive current
- $I_N$  = negative current
- $T_1$  = phase one pulse time
- $T_2$  = phase two pulse time
- $T_{IP}$  = interphase delay time
- $T_T$  = pulse repetition time (1/F)



Rear panel showing USB, Monitor and Expansion ports

## Ordering Information

16-10000	FNS-16	Stimulator with output connector box, all cables, and software
16-11000	FNX-16	Sixteen-channel expansion unit for above
16-10001	FNS-4	Four-channel version with Labview & Visual Basic software

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