

# CereStim™ Switch

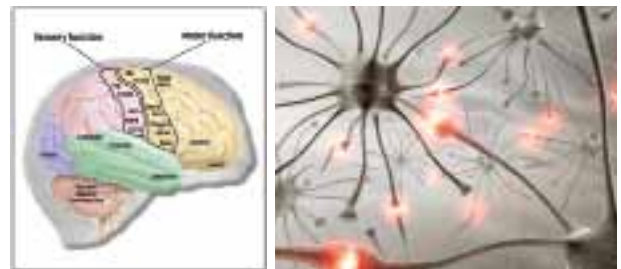


## Applications

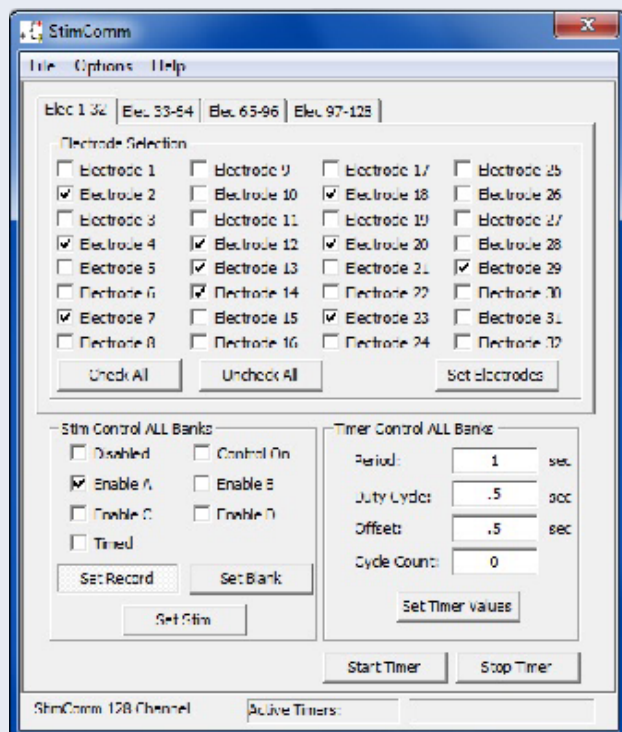
- >> Antidromic stimulation
- >> Closed-loop optimization of deep brain stimulation
- >> Pain modulation
- >> Functional brain mapping

The CereStim™ Switch provides unprecedented electrode switching control for neural stimulation applications by enabling high-quality neural recordings (spikes and field potentials) immediately after stimulation. The CereStim™ Switch is an add-on module for the Cerebus™ data acquisition system. It allows researchers to programmatically switch individual electrodes between a stimulation source and the recording electronics. Each CereStim™ headstage module can switch up to 32 electrodes. Multiple modules can be combined for switching up to 256 electrodes. Switch control is accomplished using the provided CereStim™ Comm GUI or by external gating (TTL) with a 3rd-party control system.

- 1 CereStim™ Switch Control Module – Interfaces headstage module with the control computer and analog stimulation sources
- 2 CereStim™ Switch Headstage Module – Digitally-controlled solid-state switches for connecting electrodes to stimulation sources and recording electronics



## CereStim™ Switch Software User Interface



**Functional Brain Mapping** – Identify eloquent regions such as those associated with motor, sensory, and cognitive functions

**Antidromic Stimulation** – Determine if a synapse exists in the neural pathway under study

## Key Features

- >> Fast switching between stimulate and record modes
- >> Switches up to  $\pm 15$  V, 30 mA per channel
- >> Available in 32-128 channels in 32-channel increments
- >> Interfaces with low- and high-impedance electrodes
- >> Ensures high-quality neural recordings immediately after stimulation
- >> Real-time stimulus artifact rejection
- >> Compatible with monopolar and bipolar stimulation paradigms
- >> GUI software-control (CereStim™) via USB port
- >> Hardware (TTL) control
- >> BNC or high-density connector interface to 3rd-party stimulation source

## Specifications

Stimulation inputs	< 1 kΩ (@ 1 kHz) impedance between input and output when stimulation mode is enabled. > 10 MΩ (@ 1 kHz) input impedance when stimulation mode is disabled
Recording outputs	< 1 kΩ (@ 1 kHz) between input and output when read mode is enabled > 10 mΩ (@ 1 kHz) output impedance when read mode is disabled
Minimum switching time	< 300 μs when using the Enable In input to switch between modes; 1 ms when using CereStim™ software to switch between modes
Maximum Cerebus™ front-end amplifier recovery time	< 3 ms
Maximum stimulation input current	30 mA on any one channel
Maximum stimulation input	Voltage range: ±15 V between any input and ground on any one channel
Enable In input voltage range	-0.1 V to +5.0 V
Multi-stim switch (> 128 channels) synchronization	< 1 μs skew when using the Enable In input for synchronization
PC hardware interface	USB A-B cable
CereStim™ Comm PC software Compatibility	Windows 7 (32 and 64)
Internal power supply	Standard 3-pin PC power connector accepting 110-240 VAC, 50-60 Hz
Emergency off switch	¼" mono phone plug, normally open switch with < 1 kΩ on resistance recommended

## Complete CereStim™ Switch System:

- 1 CereStim™ Switch control module (32-, 64-, 96-, and 128-channels)
- 1 Power cord
- 2 Rack mounting ears and 4 screws
- 4 Rubber mounting feet
- 1 CereStim™ software CD-ROM
- 1 CereStim™ Switch manual
- 1 USB A-B cable
- 4 Headstage module
- 4 Headstage module cable (37 Conductors, 3ft long)

