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 programatically 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.

**Applications**

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

**Key Features**

- Fast switching between stimulate and record modes
- Switches up to ± 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

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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

**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
## Specifications

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

### 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)