Bilateral Electroencephalogram (EEG) Monitoring Guide
Density Spectral Array (DSA) Review

**EEG Waveforms**

The EEG can be represented as a combination of individual frequencies, typically from 0 to 30 cycles/sec (Hz) of varying sizes or power. As the EEG changes due to cerebral metabolic demands, the component frequencies and their associated power can also change.

<table>
<thead>
<tr>
<th>Frequency Range</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Beta 13-30 Hz</td>
<td>Awake</td>
</tr>
<tr>
<td>Alpha 8-13 Hz</td>
<td>Moderate Sedation</td>
</tr>
<tr>
<td>Theta 4-8 Hz</td>
<td>General Anesthesia</td>
</tr>
<tr>
<td>Delta 0-4 Hz</td>
<td>Deep Anesthesia</td>
</tr>
</tbody>
</table>

**Density Spectral Array (DSA)**

DSA is a traditional EEG power-based display used to convey the frequency and power distribution of the EEG signal over time. The frequency ranges that predominate are depicted via a color spectrum where warmer colors (e.g., red and orange) indicate more dominant frequencies, and cooler colors (blue and green) indicate frequencies that are not as dominant.

The frequency range is shown on the horizontal axis with a range from 0 to 30 Hz.

*DSA is indicated for monitoring the state of the brain.*
Parameter Review
Spectral Edge Frequency (SEF) and Asymmetry (ASYM) Indicator*

**Spectral Edge Frequency (SEF)**
The SEF is a traditional EEG power-based parameter displayed both numerically and graphically (as a white line) in Hertz (Hz) for both the left and right hemispheres of the brain. It is the frequency below which 95% of the power on that side of the brain resides. The SEF varies as EEG signal power shifts from one frequency range to another.

**Asymmetry (ASYM) Indicator***
- The Asymmetry Indicator is an EEG power-based parameter that quantifies hemispheric differences in relative total power of the EEG.
- The Asymmetry Indicator is a simplified way of viewing power differences noted in the DSA display between the left and right hemispheres.
- The ASYM scale begins at 20% to highlight potentially clinically significant asymmetry. ASYM data beginning at 0% is available in the chart data screen.
- The white graph indicates the side with relative greater power.

* ASYM is indicated for monitoring the state of the brain.
Preferred Bilateral Screens

**Preferred Bilateral Screens**

- DSA in primary window,* and BIS R and BIS L dual BIS™ trend in secondary window**

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*See “Configuring the Bilateral Screen” on the back cover of this tool for configuration instructions.

**Select “BIS” in Secondary Variable section of primary BIS VISTA™ menu to view BIS R and BIS L dual trend.

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**Four-channel EEG in primary window,* and BIS™ R and BIS L dual trend in secondary window**

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*See “Configuring the Bilateral Screen” on the back cover of this tool for configuration instructions.

**Select “BIS” in Secondary Variable section of primary BIS VISTA™ menu to view BIS R and BIS L dual trend.
Configuring the Bilateral Screen

Press the BIS™ number screen to enter and exit the Bilateral menu.

Once in the Bilateral menu (as seen here), press the left screen button (BIS EEG DSA) to configure the larger display window on the screen.

The middle button (BIS EEG ASYM) will configure the upper right window of the screen. In total there are six combinations of screen configurations.

On this Bilateral menu screen, users can select whether to display the BIS™ value calculated from the right (BIS R) or the left (BIS L) hemisphere by pressing this button. The selection will be indicated by the bright green color. As a reminder, users will only see one BIS number (BIS R or BIS L).