

# BIS Module, E-BIS

For monitoring the state of the brain in the OR, ICU and procedural sedation locations with the BISx™ platform



The E-BIS Module with the BISx digital signal processing unit provides a Bispectral Index™ (BIS™), a continuous processed EEG parameter that correlates to the patient's level of hypnosis, where 100=awake and 0=flat line EEG. The BISx unit receives, filters, and processes patient EEG signals using bispectral analysis and the BIS algorithm to derive BIS Index values.

## Benefits of BIS monitoring

Use of the Bispectral Index (BIS) in adults and pediatrics may enable clinicians to:

- Assess the level of consciousness and sedation
- Titrate anesthetic drugs to individual patient requirements, and reduce the use of hypnotic anesthetics
- Aid in faster and more predictable wake-up and extubation

## Features

- Improved performance in electromyogram (EMG) conditions
- Enhanced resistance to electrocautery
- Improved performance in both light and deep states of anesthesia and sedation
- Family of sensors available: BIS Quatro sensor, BIS Pediatric sensor, and BIS Extend sensor

## Display options



- BIS information integrated into CARESCAPE™ and S/5 modular monitor screens
- In addition to the BIS, the GE monitors display one channel of raw EEG waveform, Suppression Ratio (SR), Signal Quality Index (SQI) and Electromyography (EMG)
- Trending of BIS values, EMG and SR for up to 24 hours in anesthesia and 72 hours in critical care



## Technical specifications

### Direct function keys

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BIS™		Opens BIS menu
Check Sensor		Starts impedance measurement of electrodes

### BIS EEG

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EEG scales	25 to 400 $\mu$ V
EEG sweep speeds	12.5/25/50 mm/sec
BIS	0 to 100
SQI	0 to 100
EMG	
CARESCAPE modular monitors	25 to 100 dB (70 to 110 Hz)
S/5 modular monitors	30 to 80 dB (70 to 110 Hz)
Suppression ratio (SR)	0 to 100%
Filters	ON (2 to 70 Hz with notch), OFF (0.25 to 100 Hz)
Mode	Sensor automatically selects mode

### BIS

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Update rate	1 second for BIS index
Smoothing rate	User selectable in BIS menu, 15 or 30 seconds

### BISx™ (Digital Signal Processing Unit)

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Analog to digital converter	Noise-shaped sigma-delta
Sampling rate	16,384 samples/second
Resolution	16 bits at 256 samples/second
Input impedance	> 50 Mohms typical
Noise	< 0.3 $\mu$ V RMS (2.0 $\mu$ V peak-to-peak) 0.25 to 50 Hz
Common mode rejection	110 dB at 50/60 Hz to earth ground (Isolation mode)
Bandwidth	0.25 to 100 Hz (-3dB)

### Sensor compatibility

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BIS Quatro, Extend and Pediatric

### Monitor compatibility

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CARESCAPE modular monitors

S/5 modular monitors using software L-(C)ANE02(A), L-(C)ICU02(A) or later versions

## Environmental specifications

### Operating conditions

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Temperature	10 to 40°C (50 to 104°F)
Relative humidity	10 to 95% non-condensing

### Storage conditions

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Temperature	-25 to 70°C (-13 to 158°F)
Relative humidity	10 to 95% non-condensing

## Physical specifications

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### E-BIS Module

Dimensions (H x W x D)	11.2 x 3.7 x 18.9 cm (4.4 x 1.5 x 7.4 in)
Weight	0.3 kg (0.7 lb)

### BISx™ Digital Signal Processing Unit

Dimensions (diameter, thickness)	9.5 cm, 6.3 cm (3.75 in, 2.5 in)
Weight	0.284 kg (0.6 lb)

### Integral BISx Cable

Length	2.7 m (9 ft)
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### Patient Interface Cable (PIC Plus)

Length	1.2 m (4 ft)
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## Warranty

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One year

A NOTE ABOUT the BIS™ system: The CARESCAPE and S/5 modular monitors use a component device, BISx, in deriving the Bispectral Index™ (BIS) purchased from Covidien. It is important to recognize that this index is derived using solely that company's proprietary technology. It is recommended that clinicians review applicable information on its utility and/or risks in Covidien's "Monitoring Consciousness - Using the Bispectral Index During Anesthesia, A Pocket Guide for Clinicians" (Second Edition), Scott D. Kelley, MD, or contact Covidien if they have clinical-based BIS-monitoring questions relating to this module portion of the monitor.

BIS is a complex monitoring technology intended for use as an adjunct to clinical judgment and training. Clinical judgment should always be used when interpreting the BIS values in conjunction with other available clinical signs. **Reliance on the BIS values alone for intraoperative anesthetic management is not recommended.** As with any monitored parameter, artifacts and poor signal quality may lead to inappropriate BIS values. Potential artifacts may be caused by poor skin contact (high impedance), muscle activity or rigidity, head and body motion, sustained eye movements, improper sensor placement and unusual or excessive electrical interference. BIS values should also be interpreted cautiously with certain anesthetic combinations, such as those relying primarily on either ketamine or nitrous oxide/narcotics to produce unconsciousness. Due to limited clinical experience in the following applications, BIS values should be interpreted cautiously: in patients with known neurological disorders, and those taking other psychoactive medications.

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## About GE Healthcare

GE Healthcare provides transformational medical technologies and services that are shaping a new age of patient care. Our broad expertise in medical imaging and information technologies, medical diagnostics, patient monitoring systems, drug discovery, biopharmaceutical manufacturing technologies, performance improvement and performance solutions services help our customers to deliver better care to more people around the world at a lower cost. In addition, we partner with healthcare leaders, striving to leverage the global policy change necessary to implement a successful shift to sustainable healthcare systems.

Our “healthymagination” vision for the future invites the world to join us on our journey as we continuously develop innovations focused on reducing costs, increasing access and improving quality around the world. Headquartered in the United Kingdom, GE Healthcare is a unit of General Electric Company (NYSE: GE). Worldwide, GE Healthcare employees are committed to serving healthcare professionals and their patients in more than 100 countries. For more information about GE Healthcare, visit our website at [www.gehealthcare.com](http://www.gehealthcare.com).

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GE imagination at work