

Optical encephalography

Spectratech OEG-16

OEG-16 is to measure changes in the amount of in vivo blood simultaneously on multiple channels, utilizing the absorption characteristic around near-infrared to red light that changes depending on the bonding state of in vivo hemoglobin (Hb) and oxygen. The spread spectrum modulation originally developed by Spectratech in the latest digital technology is adopted for light modulation/demodulation, and it has achieved significant cost reduction, downsizing, and high performance. The equipment specially targets the frontal lobe where few hairs are seen, and simple, quick setup and noninvasive measurement is possible. It also provides a battery operation for the mobile measurement, and the simultaneous measurements for multiple examinees. In addition, the equipment operates independently, or by being connected with PC via USB port, where Windows is installed.

Please note that the equipment has been developed exclusively for research purposes, and should not be used for clinical or other purposes. The equipment does not have FDA (Food and Drug Administration) approval.

“Great news”
for researchers in
functional neuroimaging
Small Size,
High performance, and
Low price

**Optical encephalography that uses the spread spectrum modulation
in the latest light modulation technology**



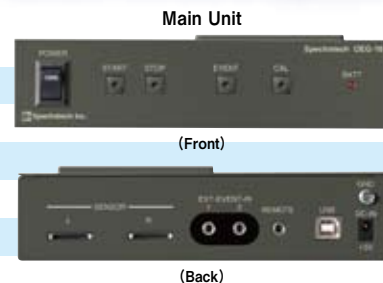
Model
Spectratech OEG-16

* Spectratech OEG-16 was domestically introduced at the 7th Seminar of Japan Optical Functional Brain Imaging Society (<http://jofbis.umin.jp/>) held in July, 2007, and internationally announced at ISBET2009Kyoto (<http://bfe.kuee.kyoto-u.ac.jp/ISBET2009/>) on September 30, 2009. The spread spectrum modulation originally developed by Spectratech represents the latest light modulation technology.



Features

- ① Small-sized Main unit (about half the size of a notebook PC), suitable also for mobile measurement.
- ② Dedicated design for use on the frontal lobe.
- ③ Adoption of spread spectrum modulation in the latest light modulation technology.
- ④ 6 light-emitting points, 6 light-receiving points, and 16 measurement points/channels.
- ⑤ Event-related designs and block designs are available.
- ⑥ Synchronous operation with other measurement device (TTL level input) such as triggers.
- ⑦ Event signal input from an external device such as stimulus presentation PC (TTL level), or by manually inserted input.
- ⑧ Signal bandwidth of oxyhemoglobin and deoxyhemoglobin: 0.76Hz (0.65sec sampling time).
- ⑨ Real-time measurement and display with PC connected via USB port.
- ⑩ Operation with AC110V input, or battery.
- ⑪ Operation with battery only for up to 1 hour for mobile measurement.
- ⑫ Continuous operation with AC power input for up to 10 hours.
- ⑬ Carrying bag for mobile measurement (detachable).
- ⑭ Simultaneous measurement by multiple units (hyper-scanning) to record multiple subjects. Up to 5 units with the optional Distributor are available.



Specification

Spectratech OEG-16-01 Head module

- 1) Light-emitting module: 6 pieces installed, LED with two wavelengths built in (Wavelength 1: 840nm Wavelength 2: 770nm)
- 2) Light-receiving module: 6 pieces installed, Si PIN photo diode
- 3) 16 channels for simultaneous measurement
- 4) Distance between light-emitting module and light-receiving module: 3cm

Spectratech OEG-16 Main Unit

- 1) Measuring method of biological signal
 Δ CoxyHb, Δ CdeoxyHb, and Δ CtotalHb based on the modified Lambert-Beer Law
- 2) Multiple-light modulation system
 Modulation method: Spread spectrum modulation DS (Direct Sequence) system^{Note1}
 PN-CODE: M-sequence code
 Bandwidth of effective biological signal: 0.76 Hz (Sampling interval: 0.65sec)
- 3) Event input function
 Possible to input manually at an optional time using the attached BOX for manual event-trigger input
- 4) External trigger input function
 Two systems of photo-isolated "External trigger input terminal" to operate in conjunction with an external device.
- 5) Measurement time
 (1) AC power supply Continuous measurement is possible for about 10 hours.
 (2) Battery operation Continuous measurement is possible for about 1 hour.
- 6) Connection with PC
 PC (Windows installed) is connected via USB 2.0 port using the attached USB cable, The attached installation software in CD-ROM is installed to output various commands from PC, and to transfer the measurement data to the PC to record and/or display it.
- 7) Batteries (Not included with shipment)
 For main part of Main Unit: 4 x Size AA battery (Usable for about 1 hour in continuous operation)
 For photo isolation part: 2 x Size AA battery (Usable for about 6 months in continuous operation)

Note1: DS (Direct Sequence) system is one of the spread-spectrum signal generation systems, and it modulates using the pseudo-random numbers called the spread code system (PN system). There also is another method called the FH (Frequency Hopping) system.

Spectratech OEG-16-01 Head module



Spectratech OEG-16-02 Optical phantom



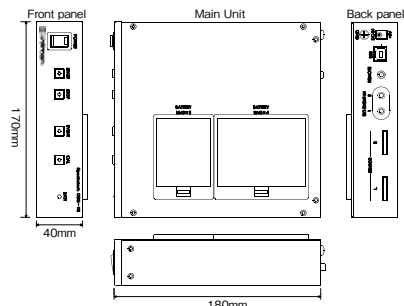
Spectratech OEG-16-03 Carrying bag



System components

SpectratechOEG-16 consists of the following components. (PC not included)

- 1) Spectratech OEG-16 Main Unit 1set
- 2) Spectratech OEG-16-01 Head module 1set
- 3) Spectratech OEG-16-02 Optical phantom 1set
- 4) Spectratech OEG-16-03 Carrying bag..... 1set
- 5) Spectratech OEG-16-04 BNC cable for external signal input 2 sets
- 6) Spectratech OEG-16-05 BOX for manual event-trigger input 1set
- 7) Spectratech OEG-16-06 USB cable for PC connection 1set
- 8) Spectratech OEG-16-07 CD-ROM for software to be installed 1set
- 9) AC adaptor for AC 110V input 1set
- 10) Users Manual 1set



- Power consumption : AC110V 15W
- External dimensions : 170 (W) × 40 (H) × 180 (D) mm
- Weight : 600g
- Recommended environment for usage
 Operating temperature range : 5°C ~ 30°C
 Operating humidity range : 20% ~ 70%

■ Appearance and specifications are subject to change without prior notice for product improvement. ■ Microsoft and Windows are registered trademarks of Microsoft Corporation in the United States and/or other countries.
 ■ Please be forewarned that the pictures shown might be slightly different from actual product.
 ■ Spectratech's Spread Spectrum Light Modulation Technology is protected by Patents referred to the registration numbers of US7729732B2, US7569821B2, JP3623743, JP4546274, and JP4465378.



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