

# Neuromaster G1

Neural Function Measuring System  
MEE-2000

*16/32 ch Intraoperative Monitoring System*



*Fighting Disease with Electronics*

 **NIHON KOHDEN**

# Multi-modality Monitoring

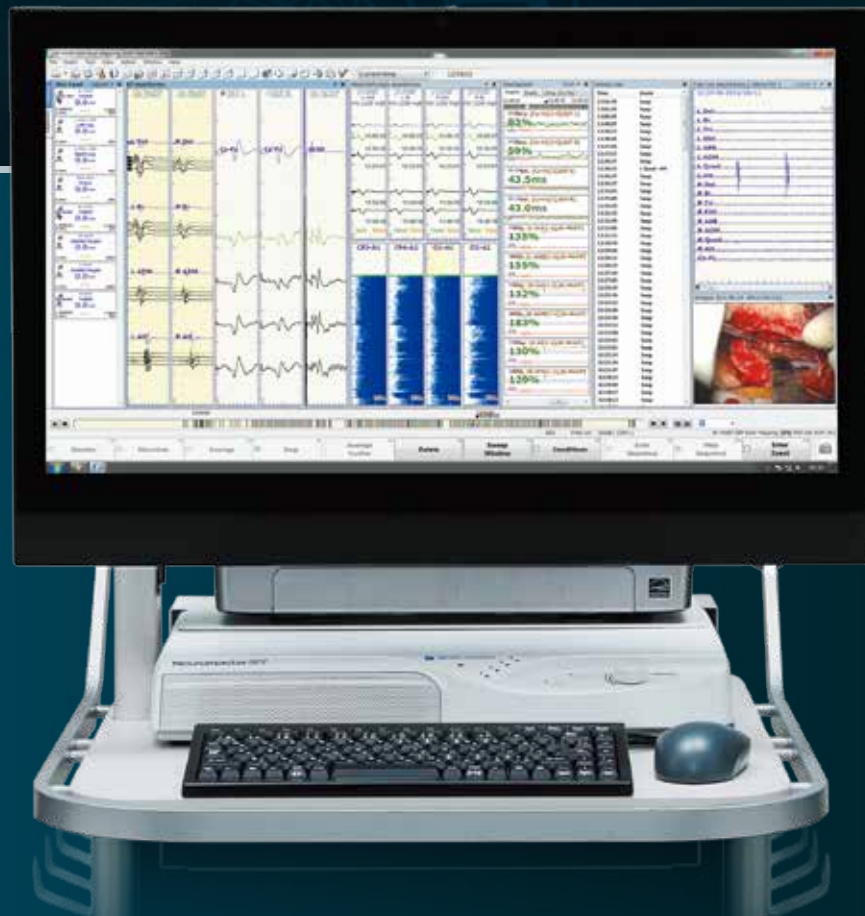


Ischemia

Motor and Sensory Function

Spinal Cord Function

16 or 32 channel  
Intraoperative  
Monitoring  
System



Flexible programming for different types of surgeries



Cranial Nerve Function

Optic Nerve Function

	CSA/DSA	SSEP	MEP	SCEP	EMG	ABR	EOG	VEP
Ischemia	█	█						
Motor and Sensory Function		█	█					
Spinal Cord Function		█	█	█				
Cranial Nerve Function					█	█	█	
Optic Nerve Function							█	█

**Neuromaster<sup>G1</sup>** is designed to prevent neurophysiological damage and lead to prognosis

# Intraoperative Monitoring Solution

## High performance in a compact unit

### 16 or 32 channel junction box

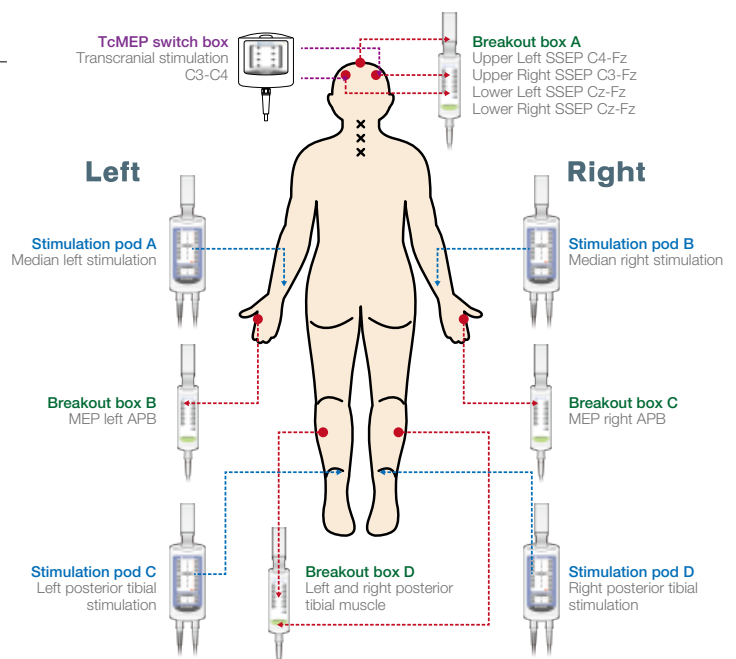
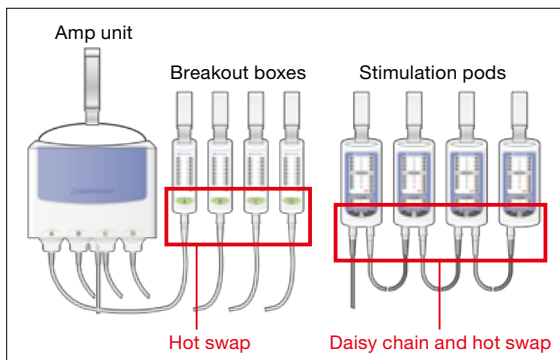
You can choose 16 or 32 channels. The main unit has 32 inputs for direct connection of electrodes.



Amp unit JB-232B

### Flexible layout

You can connect up to four breakout boxes. Each has 16 inputs and one ground. The cable is 10 m long to reach even remote parts of the OR. The breakout boxes can be hot swapped during monitoring.



### Flexible high power stimulation pods

The main unit has built-in constant current and constant voltage stimulators. Each stimulation pod has 8 high outputs and 2 low outputs.



Stimulation pod JS-201B, JS-202B, JS-203B, JS-204B  
Breakout box JB-210B

### Touch display PC or portable laptop



### 10 W high volume speaker

The internal speaker is a 10 W high volume speaker. An external speaker is not required.

### ESU detection probe

These probes detect ESU activation and mute the speaker sound to reduce noise. Two ESU detection probes can be used for both monopolar and bipolar ESU.



ESU detection probe YB-201B

### SpO<sub>2</sub> and ETCO<sub>2</sub> measurement

By connecting SpO<sub>2</sub> probes and ETCO<sub>2</sub> sensors, you can monitor vital signs on the same display.

### Advanced multi train (for research)

Various pulse durations and phases can be configured.



### Advanced TcMEP stimulation box

The TcMEP stimulation box has 8 outputs for flexible montage. The main unit has a built-in TcMEP stimulator which can give up to 1000 V constant voltage stimulation or 250 mA constant current.

### TcMEP switch box

The TcMEP switch box has 8 outputs which can be programmed for anodal or cathodal stimulation.

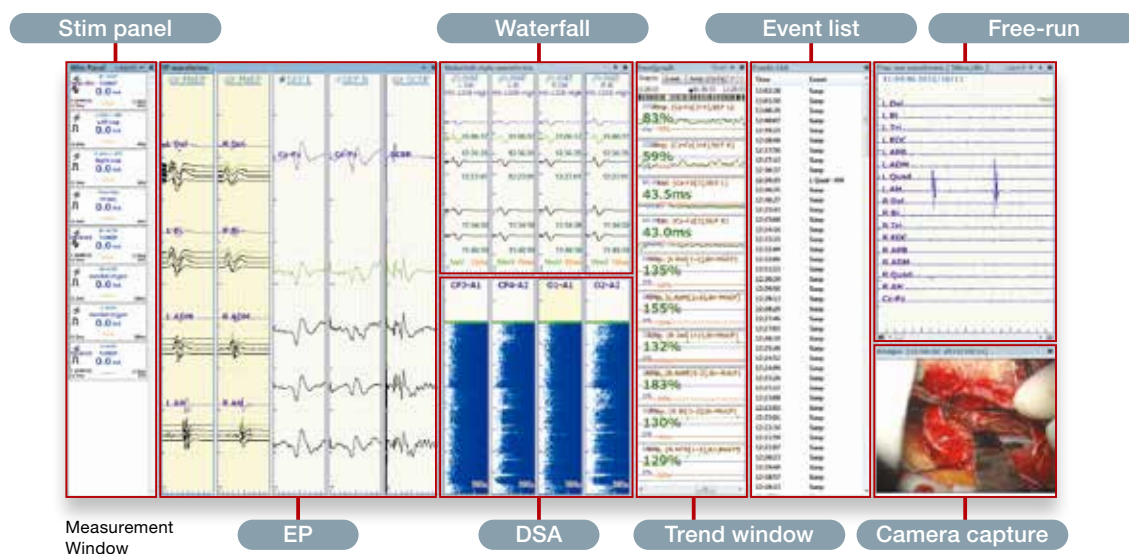


TcMEP switch box JS-210B (option)

# Flexible configuration for monitoring

## Multi-modality Flexible layouts

- Stim panel**  
 This shows all assigned stimulation settings on one panel. It can be vertical or horizontal.
- EP waveforms window**  
 This displays EP waveforms. Up to five control waveforms can be registered so you can compare past and current waveforms.
- Free-run waveforms windows**  
 This displays and lets you manage raw EMG waveforms.
- Waterfall-style waveforms window**  
 This displays EP waveforms in chronological order as a trend. It shows how waveforms change during surgery. Latency and amplitude change is clear in this window.
- CSA/DSA windows**  
 This displays the EEG waveforms trend by CSA or DSA.
- Event window**  
 This displays a list of events.
- Trendgraph**  
 This displays trend graph with numeric data and line charts.
- Camera capture**  
 This displays camera capture images such as from a microscope. (The QI-120A option is required.)
- Timer window**  
 This displays the timer window which can be useful to measure clipping time, etc.



## NeuroWorkbench

NeuroWorkbench is the common interface for all Nihon Kohden neurology products. It has test scheduling, protocol customization and data management. You can assign different tests according to the type of surgery.

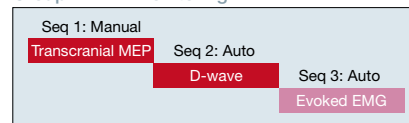


NeuroWorkbench

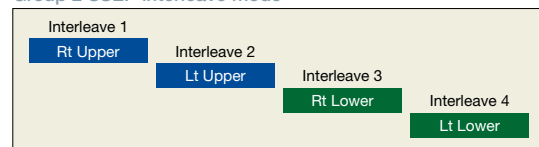
## Auto sequence mode

Auto sequence mode is used for EP waveform measurement. There are six sequences and each sequence contains up to four EP measurements. You can automatically measure different EP waveforms sequentially or in order of priority.

Group 1 MEP monitoring



Group 2 SSEP interleave mode

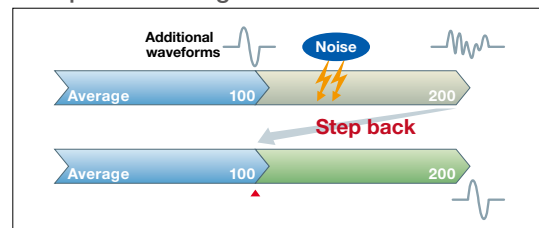


## Useful support functions

- **Step back average**

During averaging, you can remove the most recent 1, 2, 5, 10, 25, 50 or 100 waveforms from the averaging results. You can go back to the clean waveforms before noise.

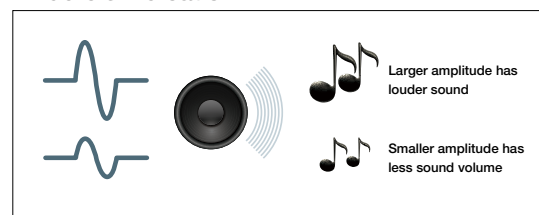
- **Step back average**



- **Audible tone indication**

Larger amplitude has louder sound, and smaller amplitude has less sound volume.

- **Audible indication**



- **TOF (Train of Four) function**

The system performs four continuous stimulations and automatically stops and shows the amplitude difference ratio of the first waveform and the fourth waveform.

- **TOF function**



- **Automatic marking**
- **Brain mapping**
- **Pedicle screw**
- **Remote monitoring**

## Specifications

Number of channels	16 (JB-316B) 32 (JB-232B)
Input impedance	≥1000 MΩ (Common mode)
CMRR	>112 dB (Isolation mode)
Noise	<4.5 μVpp (1 Hz to 3 kHz)
Sensitivity	0.05 μV to 50 mV/div
Low-cut filter	0.08 Hz to 3 kHz
A/D converter	18 bit
High-cut filter	10 Hz to 3 kHz
Sampling time	5 μs
Stimulators	<ul style="list-style-type: none"> <li>• Electric stimulator               <ul style="list-style-type: none"> <li>Output type: 1 for high or low output 1 for TcMEP output</li> <li>Maximum number of connectable electric stimulators: Stimulation pods: 4 TcMEP switch: 1</li> <li>Stimulation intensity:                   <ul style="list-style-type: none"> <li>High output (constant current): 0 to 100 mA</li> <li>High output (constant voltage): 0 to 300 V</li> <li>Low output (constant current): 0 to 30 mA</li> <li>Low output (constant voltage): 0 to 100 V</li> <li>TcMEP output (constant voltage): 0 to 1000 V</li> </ul> </li> </ul> </li> <li>• Auditory stimulator               <ul style="list-style-type: none"> <li>Stimulation waveform: Click, Tone burst</li> <li>Stimulation intensity: 0 to 135 dB SPL</li> </ul> </li> </ul>
Trigger	Number of triggers: 4
Line voltage	100 to 240 V AC (50/60 Hz)
Dimensions and weight	Main unit DC-200B: 400 W × 63 H × 315 D mm, 4.0 kg Amp unit JB-232B: 250 W × 190 H × 75 D mm, 2.0 kg

## Sample configuration

	MEE-2000 16 ch	MEE-2000 32 ch
Main unit, DC-200B	1	1
PC unit, CC-202B	1	1
Amp unit	JB-316B (1)	JB-232B (1)
Breakout box, JB-210B	2	4
Stimulation pod A/B	JS-201B (1) JS-202B (1)	JS-201B (1) JS-202B (1)
Earphones, YE-103J	1	1
ESU detection probe, YB-201B	1	1
Foot switch, RY-202B	1	1
Thermistor probe, 409J	1	1
Cart, KD-033A/AK	1	1

## Options

• Earphones	YE-103J
• LED goggles	LS-102J
• TcMEP switch box	JS-210B
• Foot switch	RY-202B
• SpO <sub>2</sub> adapter	JL-550T2
• Finger probe	TL-201T
• CO <sub>2</sub> sensor kit	TG-921T3
• ESU detection probe	YB-201B
• Camera capture unit	QI-120A

This brochure may be revised or replaced by Nihon Kohden at any time without notice.



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