NEURO-IOM

16-channel Multimodal System for Intraoperative Neurophysiologic Monitoring

Intraoperative neurophysiologic monitoring
to control the integrity of central and peripheral nervous systems

Motor evoked potentials
to control the motor pathways

Somatosensory, auditory and visual evoked potentials
to control the sensory pathways

Electroencephalogram
to assess the brain activity during the surgery

Direct nerve stimulation
to monitor peripheral nerve integrity

Flexible configurations to ensure any monitoring needs

High RF immunity

IOM

Neurosoft

NEURO-IOM SYSTEM

Neuro-IOM is a cutting edge modular platform solution that combines the years of knowledge and experience obtained in clinical and research environments. Due to flexible configuration options the system can meet the most exacting needs of both surgeon and advanced neuromonitoring specialist.

The high-performance system ensures the full flexibility to the user. The predefined configurations are intended for almost all types of surgery procedures and ensure the simple workflow thanks to intuitive user interface. Any parameter can be changed on-the-fly during the recording and easily interpreted. The time-synchronized video and audio data contribute to obtaining the reliable and accurate results.

We continue mastering the most recent technologies, implementing robust hardware and software tools to stand on the forefront of IONM devices.

IONM
APPLICATIONS
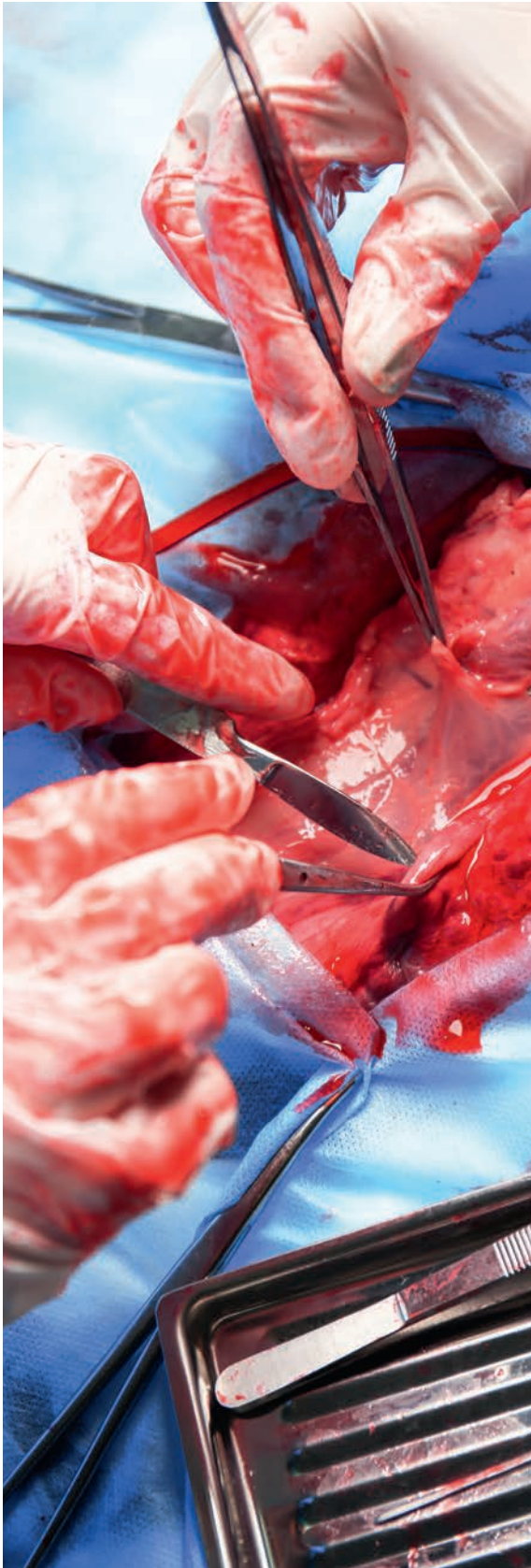
Spine surgery:

— cervical/thoracic/lumbosacral decompression and reconstruction surgery;
— pedicle screw positioning;
— intra/extramedullary spinal tumors;
— scoliosis surgery;
— tethered spinal cord syndrome;
— dorsal rhizotomy.

Intraoperative brain and cranial nerve monitoring. Mapping of functional areas of brain cortex and brainstem:

— brain/brainstem tumor surgery;
— facial nerve monitoring;
— epilepsy surgery;
— recurrent laryngeal nerve monitoring during neck and thyroid surgery;
— movement disorder surgery;
— chiasmo-sellar area (CSAB) monitoring;
— aneurism clipping.

Vascular surgery:

— aortic surgery;
— blood vessel replacement;
— endarterectomy;
— cardiac surgery.

DEVICE CONFIGURATION

VIDEO FROM UP TO THREE CAMERAS OR MICROSCOPE

SMOOTH-RUNNING TROLLEY TO MOVE THE SYSTEM EASILY

DATA PRINTING DURING MONITORING

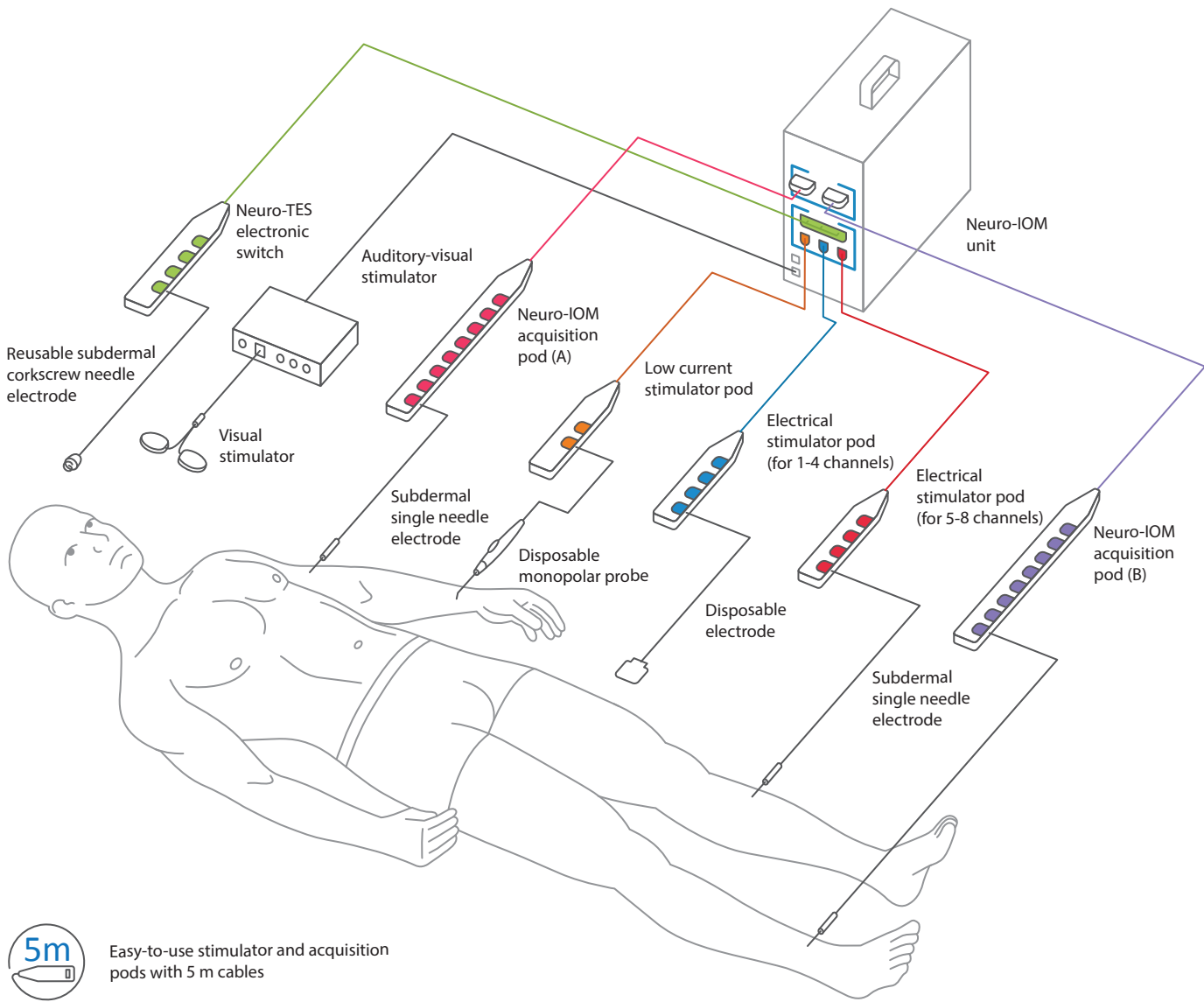**16-CHANNEL UNIT IN BASE DELIVERY SET**

IONM MODALITIES

The Neuro-IOM system is delivered with the preset templates ensuring all main modalities: free-run EMG, direct nerve stimulation including pedicle screw test, SEP, MEP, EEG, AEP, VEP, ECoG, direct cortical stimulation, train-of-four (TOF) stimulation.

Optional:

— anesthesia depth monitoring;
— SpO_2 recording.

Neuro-TES electronic switch

Reusable subdermal corkscrew needle electrode

Visual stimulator

Auditory-visual stimulator

Neuro-IOM acquisition pod (A)

Subdermal single needle electrode

Disposable monopolar probe

Low current stimulator pod

Electrical stimulator pod (for 1-4 channels)

Disposable electrode

Neuro-IOM unit

Electrical stimulator pod (for 5-8 channels)

Neuro-IOM acquisition pod (B)

Subdermal single needle electrode

5m

Easy-to-use stimulator and acquisition pods with 5 m cables

SYSTEM ARCHITECTURE

Amplifier

The system is equipped with a reliable low-noise universal neurophysiological amplifier allowing high-quality acquisition of EMG, EEG, EP and other modalities. The system can be supplied with 8- or 16-channel amplifier upon customer's request.

Transcranial Electrical Stimulator

Transcranial electrical stimulator is intended for stimulation of motor cortex in order to elicit motor evoked potentials in peripheral muscles. MEPs allow to monitor the integrity of motor pathways.

Low Current Stimulator for Direct Current Stimulation

With a special probe a surgeon can stimulate nerves in operative area of risk. At that, low current is delivered to the probe. The recording electrodes are placed on muscles innervated by nerves located in operative area. As soon as a surgeon stimulates a nerve with the probe, the system records the obtained muscle response. Thus, a specialist gets an information concerning the nerve location and its state. Using these electrophysiological data a surgeon can change the strategy in order to avoid the injury of nervous tissue.

8-channel Electrical Stimulator

This device allows stimulating 8 nerves simultaneously or in any sequence to elicit somatosensory evoked potentials. SEPs are recorded with amplifier from various sites of peripheral nervous system along the efferent pathways. SEPs are sensitive to peripheral nerve events, spinal cord pathway injuries, and also changes in blood supply of brain and spinal cord.
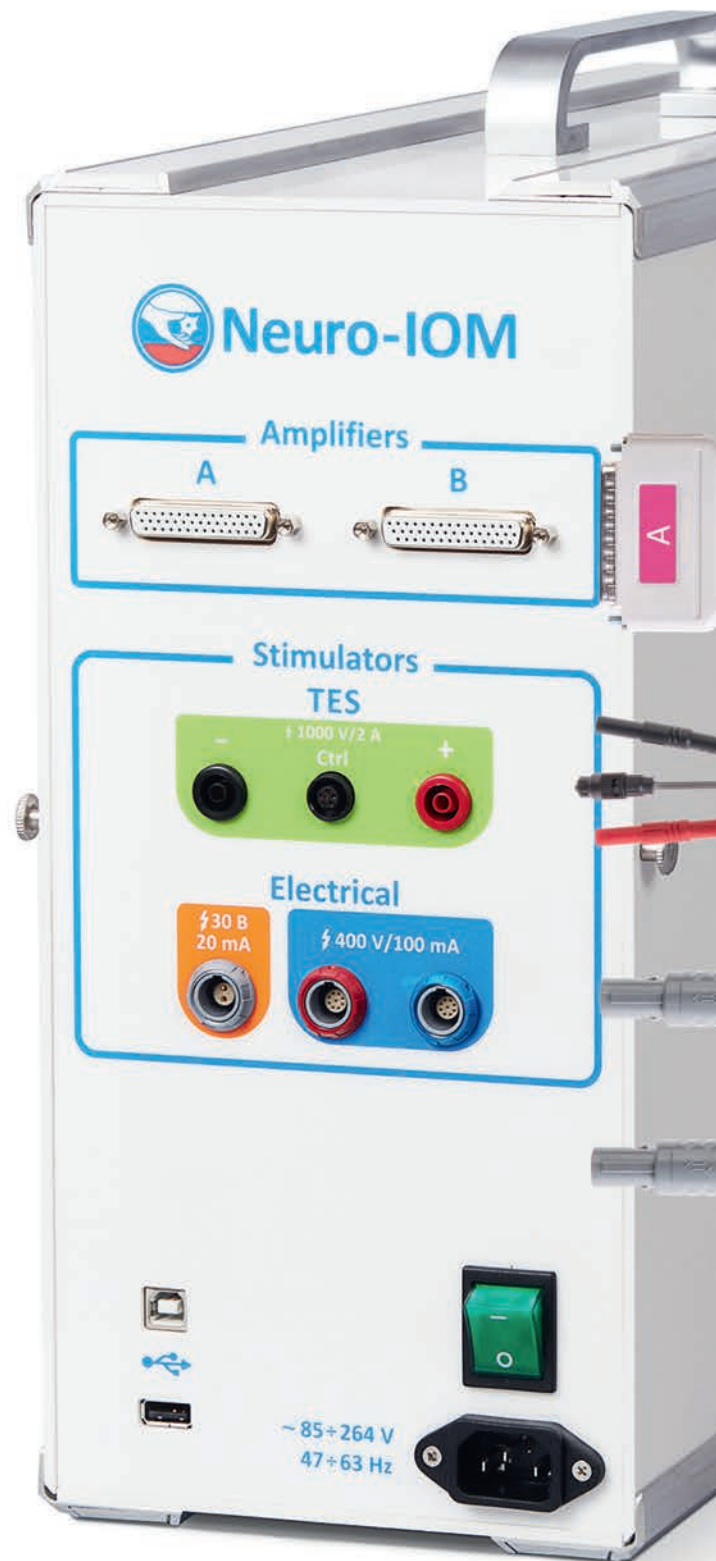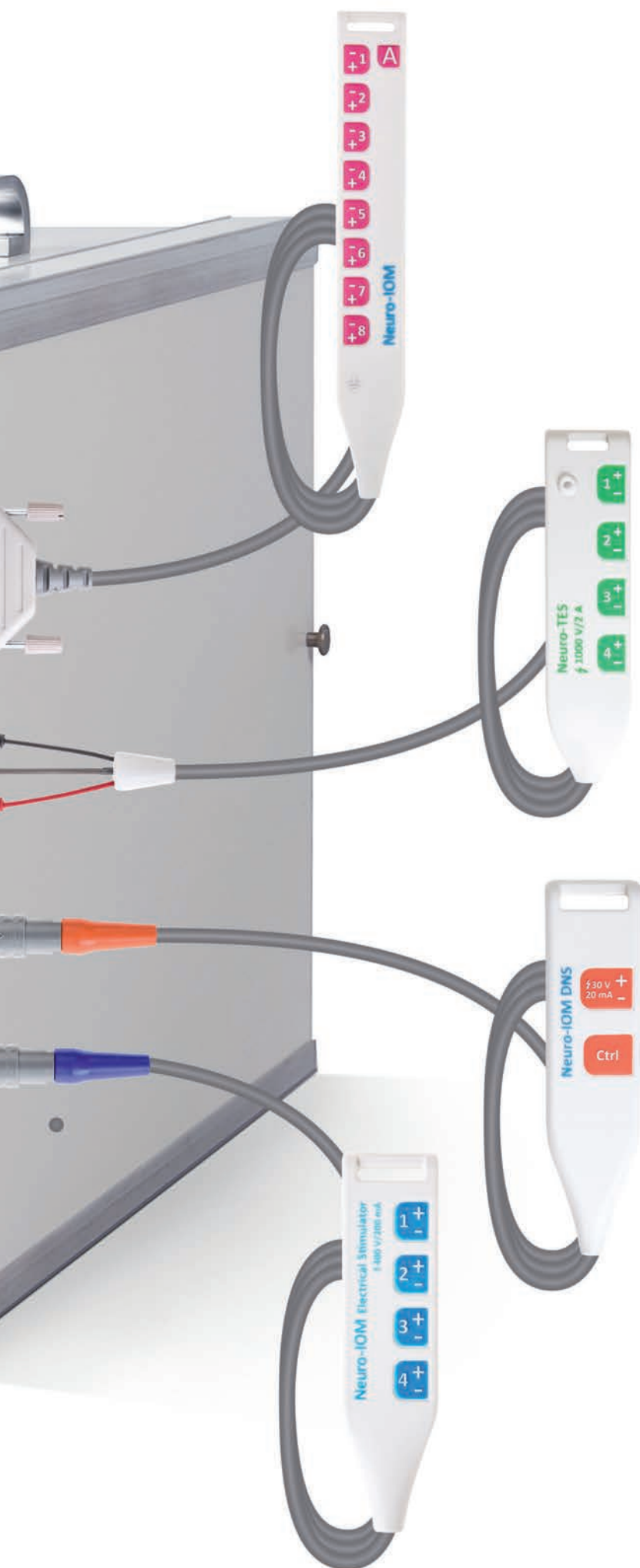
Acquisition Pods to Attach Recording Electrodes

The system is equipped with the acquisition pods with 5-meter shielded cables to attach the recording electrodes. The signal acquisition at IONM is mostly done with the monopolar needle electrodes connected to the touch-proof inputs of the pod.

TES Electronic Switch

During the monitoring it is often required to change stimulation site, for example, stimulate left or right side, arm or leg area. For this purpose a special electronic switch is built in. It has 8 outputs to attach the stimulating electrodes. A pair of outputs to deliver a stimulus is specified in Neuro-IOM.NET software. For the transcranial electrical stimulation the special corkscrew elecrodes are commonly used.

Low Current Stimulator Pod

This pod with 5-meter cable is intended to attach different electrodes for the direct nerve stimulation. The wide range of probes can be used: concentric, bipolar, monopolar, hook, etc.

Electrical Stimulator Pods

The system is equipped with two electrical stimulator pods. Each pod has 4 outputs to attach the stimulating electrodes. The outputs can function simultaneously or in different combinations. In most cases the electrodes placed at upper extremities are connected to one pod, and at lower extremities – to another one.

NEURO-IOM.NET SOFTWARE

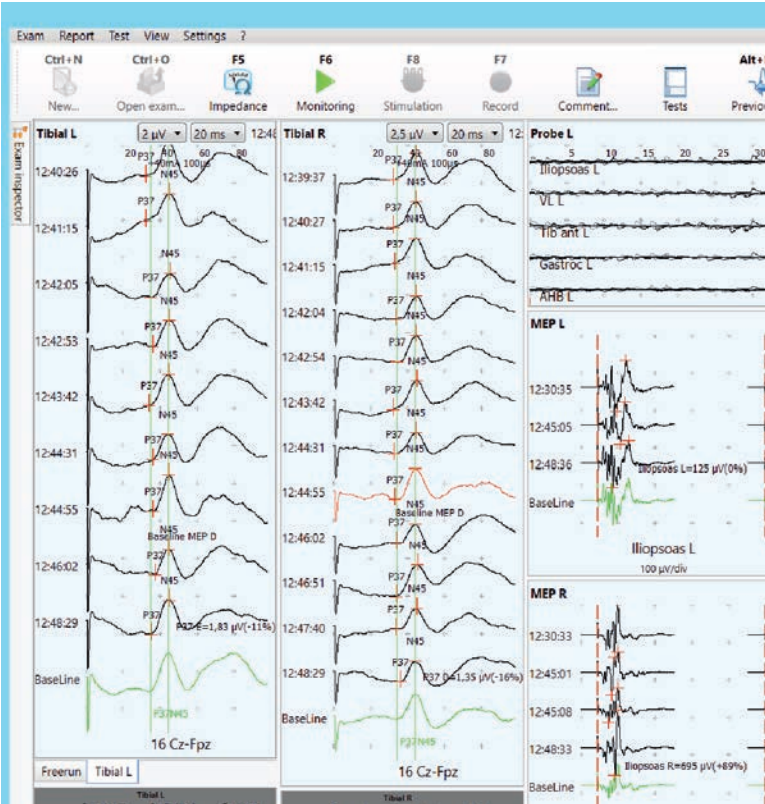
Monitoring start

To begin the monitoring, just enter patient's data and choose one of test templates.
The system provides a set of default templates for various types of surgeries.
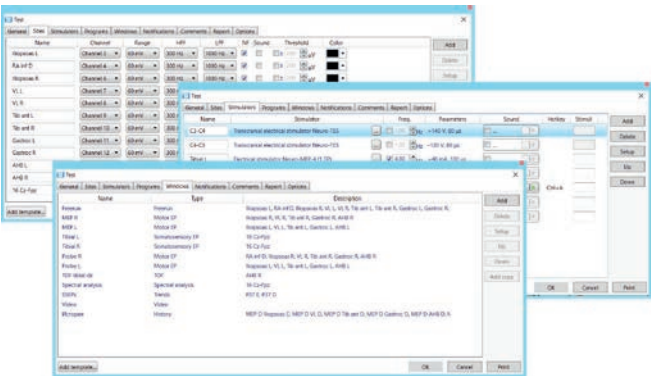
Test template editor

You can create your own test templates or edit existing ones by selecting stimulation and recording sites and also adjusting the stimulation parameters for a particular clinical case.

Test window layouts

The possibility to create various layouts of test windows and quick switching between them allows accommodating a huge amount of information obtained during multimodal monitoring.

Video recording during surgery

The video from up to three video cameras can be displayed on the screen. The video is recorded and synchronized with other data.

"Trends" window

It is possible to view the graphs showing the dynamics during the surgery displayed as trends. Any time point can be reviewed at any moment.

Monitoring report

The software allows automatically generating the monitoring report in RTF or Word format.

Data windows

The traces of different modalities can be displayed simultaneously (SEP, MEP, free-run EMG, etc.).
It is also possible to view only last obtained traces or traces in "cascade" mode with astronomical time or surgery start time tag. The current traces can be compared with baseline ones.
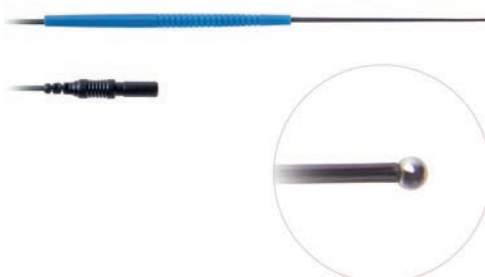
IONM ACCESSORIES

Subdermal corkscrew electrode (1.2 m cable)

Application: transcranial electrical stimulation; recording of biopotentials from scalp

Monopolar twisted-pair needle electrode

Application: electrical stimulation and recording of potentials evoked at scalp and muscles; a twisted-pair cable ensures high noise immunity

Monopolar, bipolar and concentric probes (1.9 m cable)

Application: direct stimulation of nervous structures (including brain stimulation) during the monitoring and mapping of functional areas of the cerebral cortex and cranial nerve nuclei

Neuro-TES transcranial electrical stimulator

Application: generation of high-amplitude stimuli for transcranial electrical stimulation (built in Neuro-IOM but can be supplied as external unit)

9-channel Neuro-IOM electrical stimulator unit

Application: generation of high-amplitude stimuli via 8 independent channels and low-amplitude stimuli via 1 channel during surgery (built in Neuro-IOM but can be supplied as external unit)

Auditory stimulator

Application: generation of auditory stimuli to record AEPs during surgery

Visual stimulator

Application: generation of light stimuli to record VEPs during surgery. Extra soft cushions to avoid local ishemia during long surgeries.

Adjustable DNS probe with replaceable tips and controls

Application: stimulation of various nervous structures during surgery; control of software functions by a surgeon during surgery.
LED to indicate stimulation state.
Button to start/stop stimulation.
Buttons to control stimulus intensity.