SEP EMG **EEG** Video **PSG** SpO_2 LEP EOG **LTM** VEP AEP ECG

Neuron-Spectrum-5

41-Channel Multifunctional Digital EEG System
for Neurophysiological Studies

- 32/64* EEG channels (35/70* digital amplifiers)
- Possibility of recording of any of 32/64* monopolar derivations of "10-10" system
- 4/8* wide-band polygraphic channels for the recording of any signals from EOG up to short-latency EP/EMG
- Separate ECG channel
- 2/4* direct current (DC) channels
- SpO_2 channel**
- Respiratory channel

* if two amplifiers are used
** SpO_2 channel is not included in the base delivery set and supplied by special order

Applications

- Routine EEG
- Long-term EEG monitoring for epilepsy
- Polysomnography
- Scientific researches

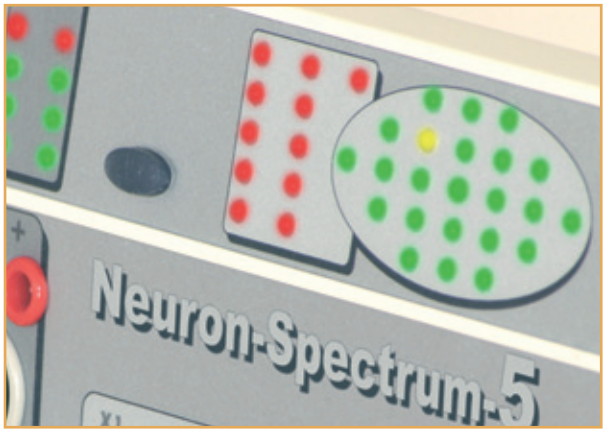
NEUROSOFT

Medical Diagnostic Equipment Development and Manufacture

What's New?

Any Electrode Can Be Used as a Reference One

Any electrode can be used as a reference one, and the bipolar derivations can be recoded without placing any other additional reference electrodes, for example, ear ones.



Button for Impedance Measurement Switching on

The impedance measurement mode can be switched on by pressing the button located on the front panel of electronic unit. The impedance values of all the electrodes are indicated on the front panel by colored LED indicators. When you place electrodes on a patient it is possible to measure the impedance on the spot.

Separate ECG Channel

The separate channel with Touch proof connectors is provided for ECG recording. Now you can record ECG without engaging one of four polygraphic channels.

DRL Derivation

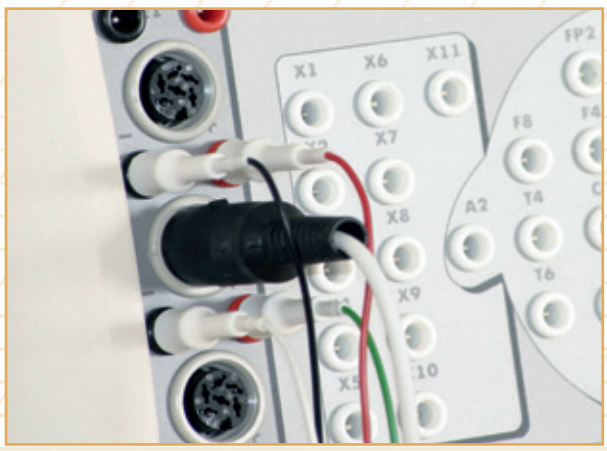
This is a special engineering solution allowing to decrease the common mode rejection at least in three times in comparison with the traditional schematic of EEG amplification.

SpO_2 Channel* (Oxygen Saturation Channel)

The SpO_2 channel complements the set of channels required for the comprehensive polysomnography studies.

More Convenient Commutation of Polygraphic Channels

To connect the electrodes to the polygraphic channels, you can use either touch-proof or DIN-6 connectors.



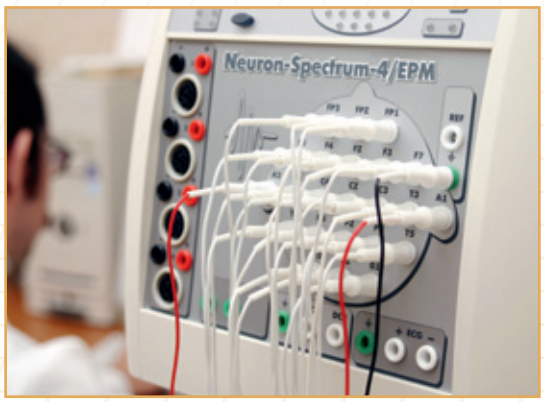
* SpO_2 channel is not included in the base delivery set and supplied by special order

Base Delivery Set

- Electronic unit
- Stand
- LED photic stimulator
- Stand for LED photic stimulator
- Set of accessories for EEG recording*:
  - Bridge EEG electrode — 21 pcs.
  - Ear EEG electrode — 3 pcs.
  - Cable for bridge and ear EEG electrode — 25 pcs.
  - EEG helmet — 3 pcs. (sizes: 42-28, 48-54, 54-62)
- Software
- User manual
- Technical manual

EN ISO 9001 EN ISO 13485 CE 0535

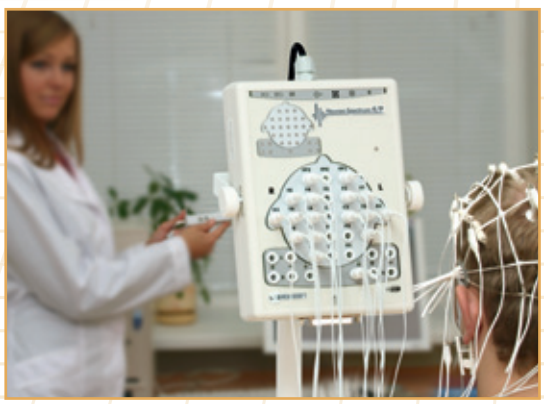
See Also



Neuron-Spectrum-4/EPM

Neuron-Spectrum-4/EPM

29-channel multifunctional digital EEG system for neurophysiological studies.
Neuron-Spectrum-4/EPM is a unique device combining 21 EEG or long-latency EP channels, 4 wide-range polygraphic channels which can be used for short-latency EP, EMG/NCS or ERG recording, ECG channel, 2 direct current channels, respiratory channel. In base delivery set it allows to perform EEG studies, record and analyze multi-channel long-latency EP, study short-latency auditory, visual, somatosensory and cognitive EP.



Neuron-Spectrum-4/P

Neuron-Spectrum-4/P, 4, 3, 2, 1

25-, 21-, 19-, 16- and 8-channel digital EEG systems.
Neuron-Spectrum digital systems are modern high-tech electronic medical devices satisfying the most exacting requirements of wide circle of customers starting from doctor in clinics and up to neurophysiologist-researcher.

* Neuron-Spectrum-5 delivery set includes only electrodes for 21-channel EEG recording. To record bigger number of channels it is necessary to buy additional electrode system.

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Software Features

EEG Recording

Neuron-Spectrum.NET software provides EEG recording on any digital system of **Neuron-Spectrum** series by 8 – 64 channels. During the recording monopolar, bipolar or mixed montages in "10-20" and "10-10" systems can be used. Any polygraphic channels (ECG, EMG, EOG, respiration (airflow, chest and abdominal movements), snoring, body position, limb movement, SpO_2, etc.) can be included in montage.
The montage can be switched at any moment: before the recording, during the recording, in the process of EEG review and analysis after the recording.
It is possible to set different parameters for the different channels. For example, if you can not delete the trend of EEG isoline in frontal derivations, you can specify the higher values of high pass filter only for these derivations. You can change the parameters of any channel in the process of the recording.

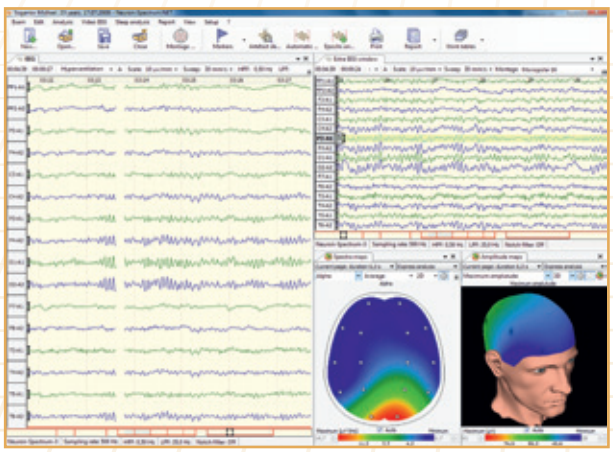
In split-screen mode you can observe the process of the recording in one part of the screen and review the recorded EEG in the other one.
The software allows performing the functional tests which are standard for EEG exams (photic stimulation, auditory stimulation, hyperventilation, eye opening). Besides, you can perform other functional tests of any duration and in any sequence.
The stimulators can be easily programmed.
You can watch the process of EEG recording both from the computer connected to the digital system or computer connected to the same local network. After EEG recording, EEG can be reviewed in "as recorded" mode as if it emulates the paper record.

EEG Storage

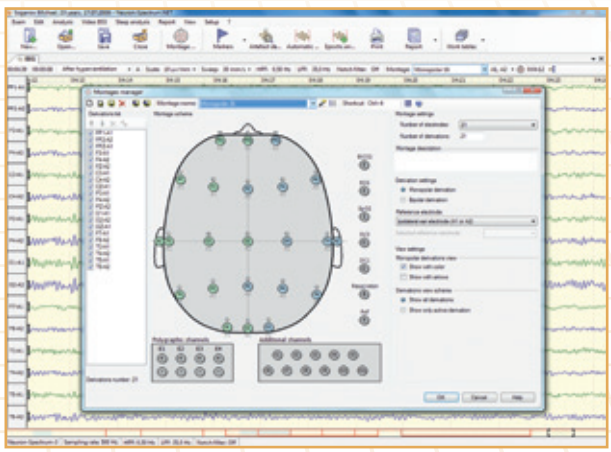
The EEG records are stored in the database which provides the advanced possibilities of structuring and search.
Neuron-Spectrum.NET software allows operating with MDB, MS SQL, MySQL databases. The archived record can be stored on CD or DVD. If it is necessary to review the archived record, the software will inform a user of the required disk to be installed in the disk drive. Besides, the records can be stored not only on the computer connected to the digital EEG system but also on any remote computer (file server). The software operates with hospital network database via GDT and HL7 interfaces.

EEG Printing

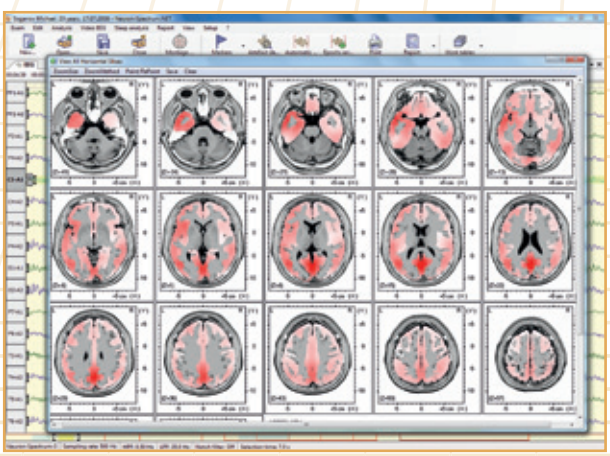
EEG with standard grid, derivation names, recording parameters can be printed on any computer printer. In the process of the recording you can mark EEG fragment which will be printed just after the recording stop.



EEG recording mode



EEG montage creation and editing



Working with **Loreta**

Example of the report generated automatically by **Neuron-Spectrum.NET** software

Optional Software

Neuron-Spectrum-PSG

Neuron-Spectrum-PSG software allows performing comprehensive polysomnography studies (sleep stage analysis, analysis of sleep-disordered breathing).

Neuron-Spectrum-Video

Neuron-Spectrum-Video software allows performing the long-term synchronous EEG and video recording from up to 3 video cameras controlled from the computer and audio information from up to 3 microphones.
There are wide possibilities to review, edit and store the recorded data.

Neuron-Spectrum-LEP

Neuron-Spectrum-LEP software allows recording long-latency auditory, visual (on flash and pattern) and cognitive EP by EEG channels (up to 32 ones) with brain mapping using both built-in and external stimulators.

Neuron-Spectrum-EP

Neuron-Spectrum-EP software provides the possibility to study short-, middle-, and long-latency auditory, visual, somatosensory and cognitive EP by 4 wide-band polygraphic channels using both built-in and external stimulators.

Neuron-Spectrum-ERG

Neuron-Spectrum-ERG software is intended for electroretinography studies.

BrainLoc

BrainLoc software is intended for 3-D dipole localization of pathological activity sources when suffering from epilepsy, injuries, insults, neoformations, and also localization of evoked potential sources, wave patterns, rhythmic activity generators.
The visualization of localization results is performed on three head views, diagrammatic sectional views of the brain structures, MRT-images that allows reviewing the analysis results of several records in multi-window mode.

Neuron-Spectrum-EMG

The specifications of 4 polygraphic channels allow to perform the comprehensive EMG studies by the following techniques:

- Electroneuromyography (motor and sensory nerve conduction study, F-wave, H-reflex (also including paired stimulation), motor and sensory inching)
- Electromyography (spontaneous activity, interference curve, motor unit potentials)
- Neuromuscular junction (repetitve stimulation, jitter)
- Additional EMG techniques (blink reflex, sacral reflex, bulbocavernous reflex, T-reflex*, galvanic skin responses)
- Transcranial magnetic stimulation**

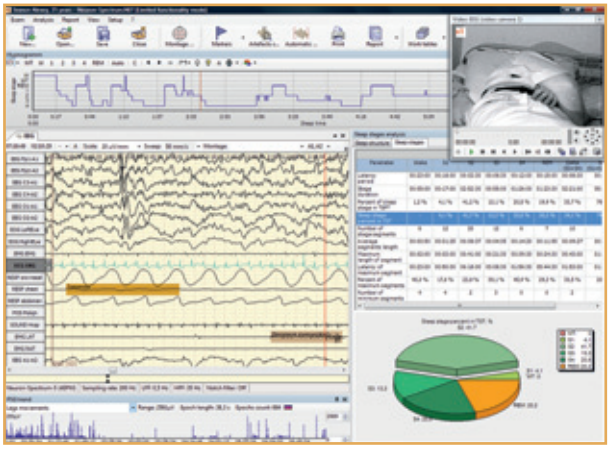
* if tendon hammer is available

** if magnetic stimulator is available

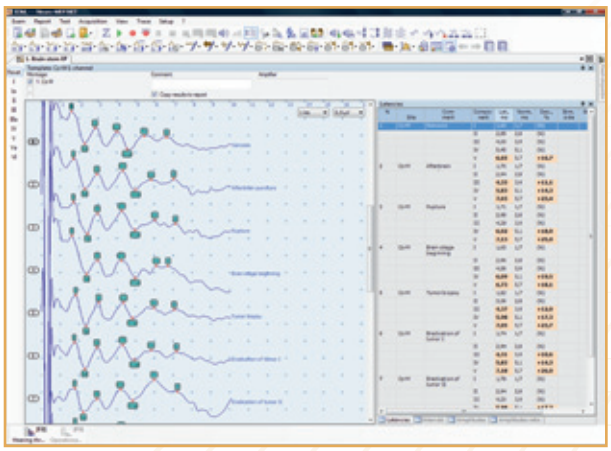
To perform EMG by all above-mentioned techniques, the digital system could be supplemented by the dedicated keyboard, the footswitch and the temperature sensor.

Poly-Spectrum-Rhythm

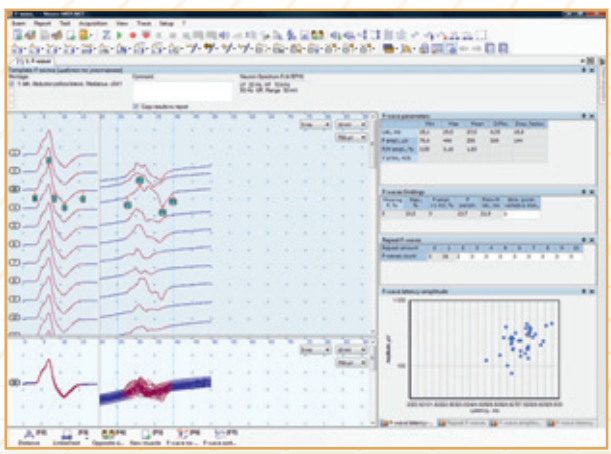
Poly-Spectrum-Rhythm software is intended for the heart rate variability (HRV) analysis with the use of data received from ECG channel built in the digital system.



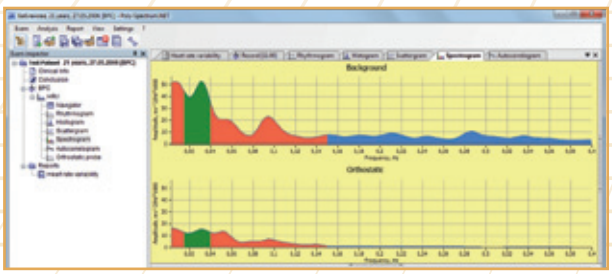
Neuron-Spectrum-PSG



Neuron-Spectrum-EP. Brainstem EP



Neuron-Spectrum-EMG. F-wave



Poly-Spectrum-Rhythm

EEG Analysis

The records can be analyzed with the use of the most modern techniques of mathematical analysis. Any fragment of the record or the whole record (with the division on epochs) can be processed. As far as the digital systems of **Neuron-Spectrum** series allow EEG recording not only in 35 Hz standard range but also in the wider frequency range, then not only standard ranges (alpha, beta, delta and theta) but also any ranges specified by a user can be analyzed at spectral analysis.

Brain Mapping. The software allows mapping of practically any parameter: EEG amplitude and spectrum power in the whole frequency range, EEG amplitude and spectrum power in the specified frequency ranges, rhythm index, etc.

Search of spikes and sharp waves is done automatically. In the result of search the software provides the list of the detected phenomena and mapping of these phenomena distribution on scalp.

The software provides the possibility of EEG coherent and cross-spectral analyses performing and coherence maps generating. The modern analysis techniques, such as Wavelet-analysis, bispectrum and bicoherent analysis, independent component analysis (ICA) are implemented in the program. Any analysis can be done in on-line mode, i.e. directly during EEG acquisition that allows tracking its dynamics during the exam.

After EEG mathematical analysis the software allows creating the automatically generated EEG description in exam report. Besides, a doctor can edit the report at her/his discretion, add any pictures and graphs. At that you can use structured comprehensive glossary which can be enlarged.

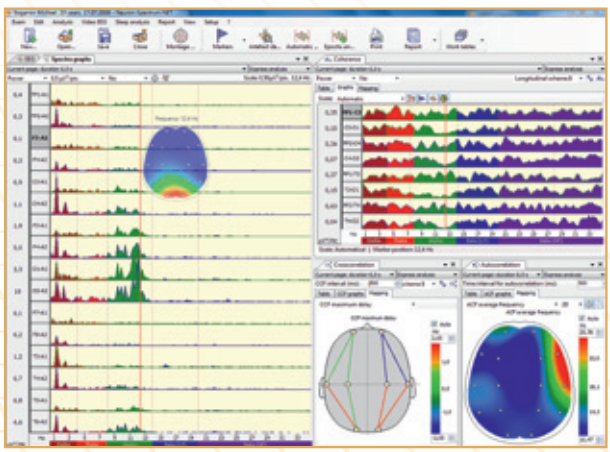
Trends

Neuron-Spectrum.NET software allows to display trends of spectrum components, EEG indexes, amplitude parameters of signals, HR, number and amplitude of epileptiform activity phenomena, etc. in any selected derivations.

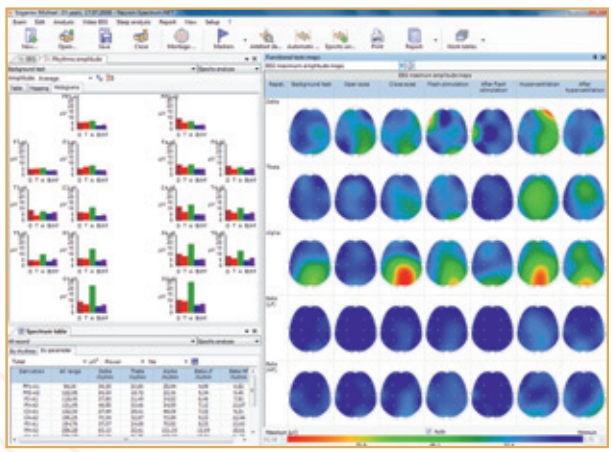
In spite of the record duration the whole trend is displayed on one screen. At that you can move to any doubtful record fragment by one mouse click on trend!

Two-monitor Operation Mode

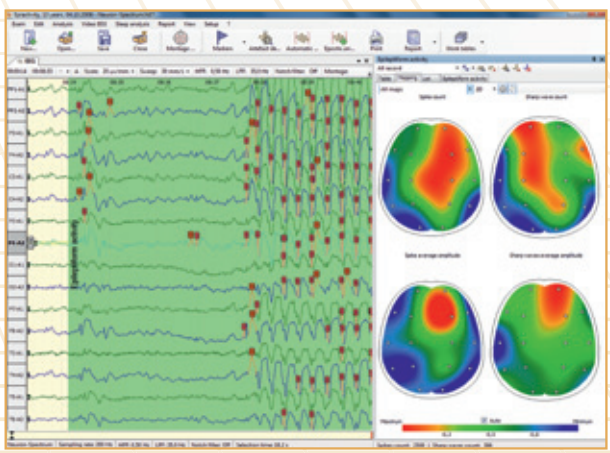
The program supports automatically two-monitor operation mode. At that the results of EEG analysis, exam report, images from the video cameras, trends, etc. are represented on the second monitor which allows using the first monitor for EEG displaying completely.



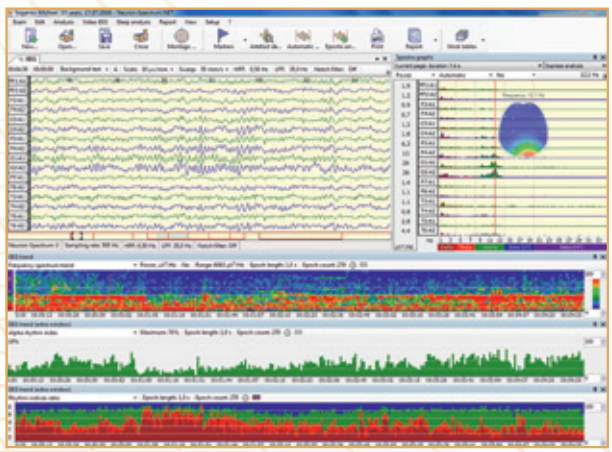
Graphs of spectral and coherent EEG analysis results



Brain mapping and bar charts of EEG analysis results



Automatic search of spikes and sharp waves



Trends of EEG parameters