

# NEURON-SPECTRUM

Digital EEG  
System Series

US-EDITION



From 8 to 21 EEG channels  
+ up to 4 polygraphic  
channels to record  
ECG, EOG, etc.



Acquisition and review  
of EEG in selected  
monopolar and bipolar  
montages



Impedance indication  
on front panel  
of EEG unit



EEG, EP, PSG  
acquisition



Built-in photic, auditory  
and pattern stimulators



Simplicity along with  
high-quality signal

EEG

• EP • PSG  
• Video EEG



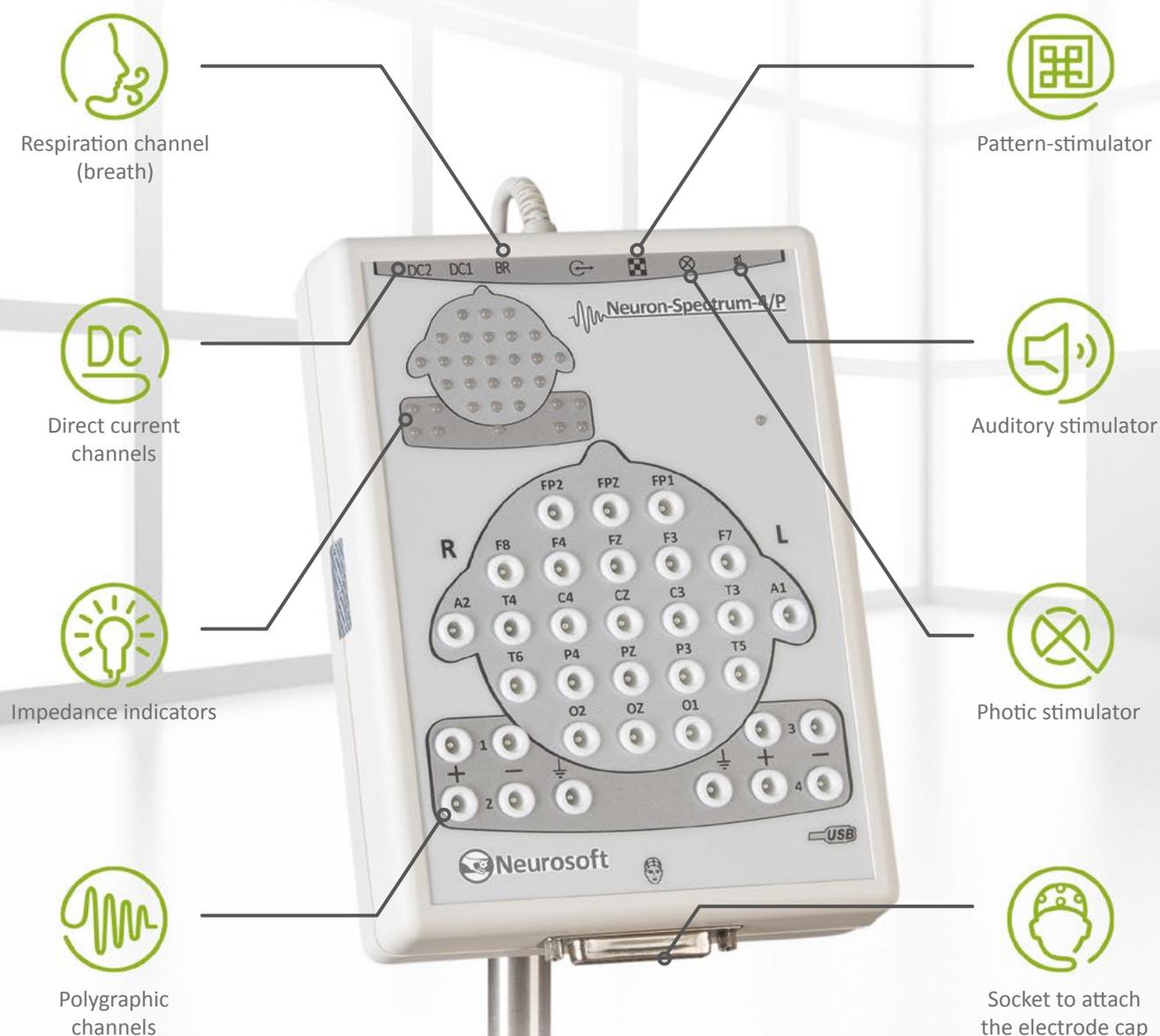
Neurosoft

# NEURON-SPECTRUM-1, 2, 3, 4, 4/P: FROM ROUTINE EEG TO RESEARCH LAB

Neuron-Spectrum-1, 2, 3, 4, 4/P are not just ordinary EEG machines. These devices embodied 25-year Neurosoft experience in EEG, EP and PSG fields and cutting edge technologies of noise rejection and signal processing.

The amplifiers and stimulators are combined in one unit. The device interchanges with the computer and is powered via USB.

The devices of Neuron-Spectrum series are designed to ensure most efficient and simple day-to-day workflow due to an easy operation at routine EEG studies, advanced software with multiple analysis options and easily customizable interface.



# MAIN ADVANTAGES

## High-quality EEG Acquisition

The high sampling rate (up to 5 000 Hz per channel) allows recording EEG signal in full frequency band without certain “swallowing” of sharp EEG components or abrupt amplitude reduce. With the low noise level the most spare EEG filtration is applied or the filtration is not done at all that saves maximum useful information in the raw signal.

## Operation in Unshielded Room

The digital EEG systems of Neuron-Spectrum series can be used in any unshielded room saving considerably the specialist’s workplace preparation costs, increasing the staff’s operation convenience and ensuring patient’s comfort.

## Impedance Indication on the Front Panel of EEG System

Often the digital EEG system and the computer to process and analyze the obtained signals are located in neighbour rooms or even far from each other. The impedance indicators on the front panel allow monitoring the signal quality during the electrode placement staying near a patient.

## Stimulators

The photic, auditory and pattern stimulators are designed to perform different stimulation procedures during EEG test and also record multimodality long-latency evoked potentials including cognitive ones. Besides the built-in stimulators, the external stimulators can be connected to the device trigger in/out or USB port.

## Socket to Attach the Electrode Cap

No adapters or other facilities are required to connect the electrode cap. Just plug it in a standard EEG system socket.

## Optional Channels

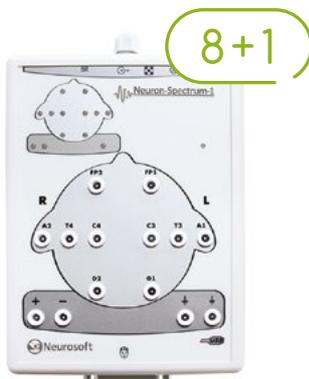
Four polygraphic channels are intended to perform PSG studies (to record EMG and other signals). The respiration channel allows recording the respiration rate and the amplitude with simple and reliable airflow thermistor sensor. The direct current channels can be used to plug in different sensors of third-party manufacturers, for example, to monitor the patient’s body position.

## Portable EEG System

The devices of Neuron-Spectrum series are ideal for outpatient EEG testing. They are powered via USB and interchange EEG data using the same cable. EEG lab can be opened at any site and the mains socket is not required. Just connect the device to notebook or even tablet PC.



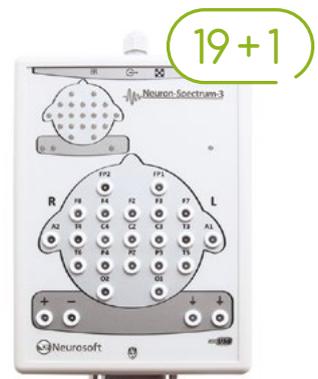
# NEURON-SPECTRUM AMPLIFIERS



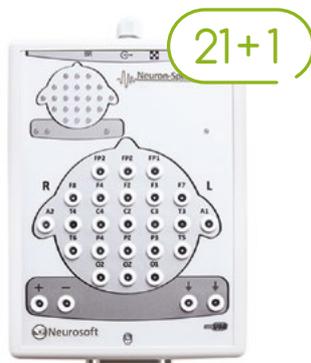
Neuron-Spectrum-1



Neuron-Spectrum-2



Neuron-Spectrum-3



Neuron-Spectrum-4



Neuron-Spectrum-4/P

**8+1** — 8 EEG channels + 1 polygraphic channel

**21+4+2** — 21 EEG channels + 4 polygraphic channel + 2 DC channels

All devices contain respiration channel.

## APPLICATION

Neuron-Spectrum-1, 2, 3, 4, 4/P devices can match perfectly your day-to-day routine EEG needs. However, they can do more.

Due to the wide range of channels, exceptional signal quality, customizable software and added accessories these devices can be used in different fields:

- ▶ routine EEG
- ▶ video EEG monitoring
- ▶ long-term monitoring
- ▶ PSG studies
- ▶ EP studies
- ▶ cerebral function monitoring (aEEG) including EEG in newborn
- ▶ research

# CONFIGURATIONS

The digital system of Neuron-Spectrum series can be supplied as EEG workstation, video EEG monitoring system or PSG system.



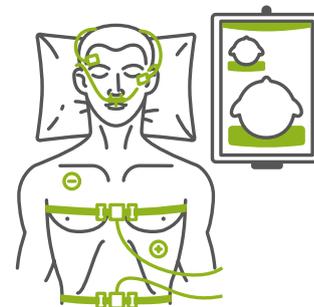
## EEG Workstation

Neuron-Spectrum-1, 2, 3, 4, 4/P on the stand with desktop PC and printer.



## Video EEG Monitoring System

Neuron-Spectrum-1, 2, 3, 4, 4/P with a camera and special software are used for long-term video EEG monitoring.



## PSG System

Neuron-Spectrum-4/P\* with PSG sensors, video camera for night monitoring and special software for sleep analysis.

\* according to AASM recommendations

# NEURON-SPECTRUM.NET SOFTWARE FEATURES

Neuron-Spectrum.NET software is the result of more than 25-year EEG experience of Neurosoft team in neurophysiology. User-friendly interface, ease of operation, advanced algorithms for data processing and modern techniques of mathematical analysis make Neuron-Spectrum.NET a good choice for physician in daily clinical routine.

The flexibility of Neuron-Spectrum.NET allows the software to fit with any user requirements

from routine EEG acquisition to complicated scientific studies.

Neuron-Spectrum.NET software saves your time in parallel computing due to powerful present-day processors. Its interface is fully compatible with touchscreen displays ensuring quick and easy operation both on desktop PC and tablets.



# EEG Acquisition

Neuron-Spectrum.NET software ensures EEG acquisition on any EEG device of Neuron-Spectrum series by 8-21 channels via USB, LAN or Wi-Fi.

During the acquisition monopolar, bipolar or mixed montages in “10-20” and “10-10” systems are used. Any polygraphic channels (ECG, EOG, airflow, chest and abdominal movements, snoring, body position, limb movements, etc.) can be included in the montage.

You can switch the montage at any moment: before the acquisition, during the acquisition, in the process of EEG review and analysis after the acquisition.

It is possible to set different parameters for different channels. For example, you can set ECG filters and scales different from those of EEG channels. Besides, you can adjust the parameters of any channel in the process of recording or during review and analysis.

In split-screen mode you can observe EEG acquisition in one part of the screen and review the recorded EEG in the other one.

Neuron-Spectrum.NET software allows performing the functional tests which are standard for EEG exams (background EEG, photic stimulation, auditory stimulation, hyperventilation, eye opening).

You can perform other functional tests of any duration and in any sequence.

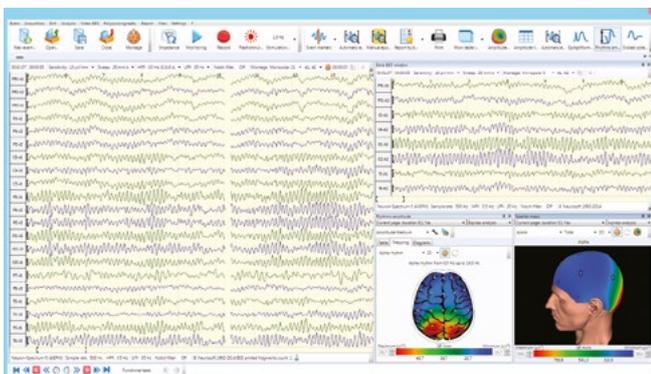
Both built-in and external stimulators can be easily programmed.

It is possible to arrange the reviewing station and review the records performed on several acquisition stations simultaneously.

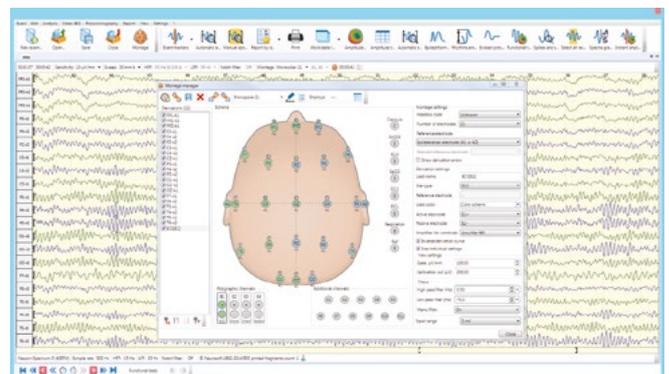
You can observe the process of EEG recording from the computer connected to the digital system, from any computer connected to the same local network or via Internet.

Review the measured impedance in any fragment of the record.

After the acquisition you can review EEG in the “as recorded” mode as if it emulates the paper record.



EEG acquisition



Creation and editing of EEG montage

# EEG Review and Analysis

Neuron-Spectrum.NET software includes the advanced navigation facilities that ensure fast access to any fragment of the record. Modern user-friendly interface is compatible with touchscreen devices and provides convenient EEG scrolling.

Records can be analyzed with 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 acquisition 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.

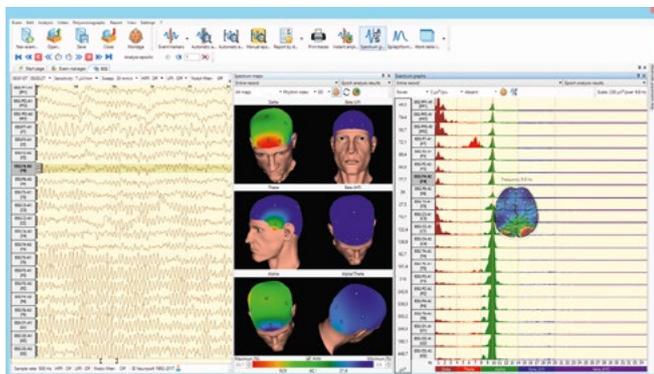
**Brain Mapping.** The software allows 2D or 3D mapping of practically any parameter: EEG amplitude and spectrum power in the whole frequency range, EEG amplitude and spectrum power in the specified frequency ranges, rhythm index, asymmetry, etc.

Any analysis can be done in on-line mode, i.e. directly during EEG acquisition that allows tracking its changes during the exam.

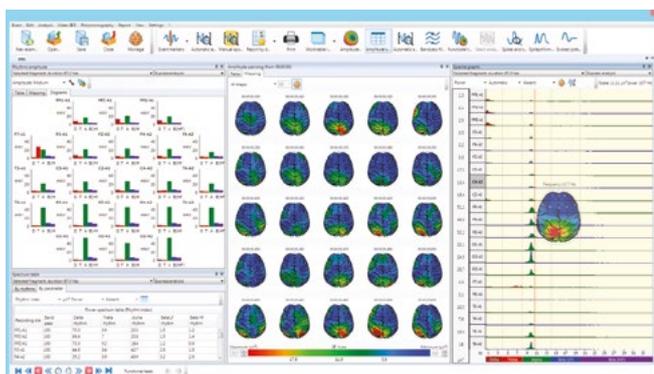
The software allows performing EEG amplitude and spectral analyses.

After mathematical analysis of EEG the software allows displaying the automatically generated EEG description in the exam report. Besides, a physician can edit the report using structured comprehensive glossary which can be enlarged, add any pictures and graphs.

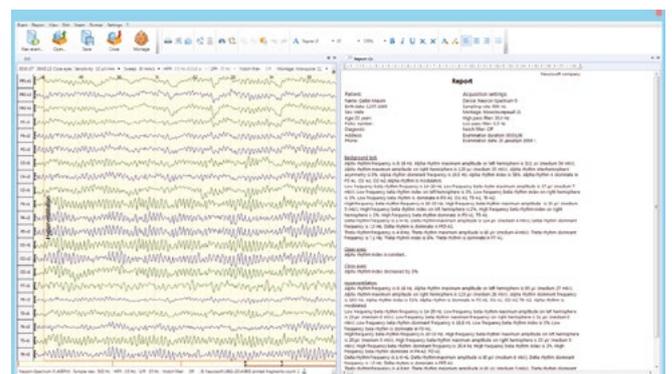
Exam reports are generated automatically on the basis of the preset templates. These templates define which information and in what order should be included in the exam report. The flexible manager of exam report templates allows creation of customized reports.



Graphs of spectral EEG analysis results



Brain mapping and bar charts of EEG analysis results



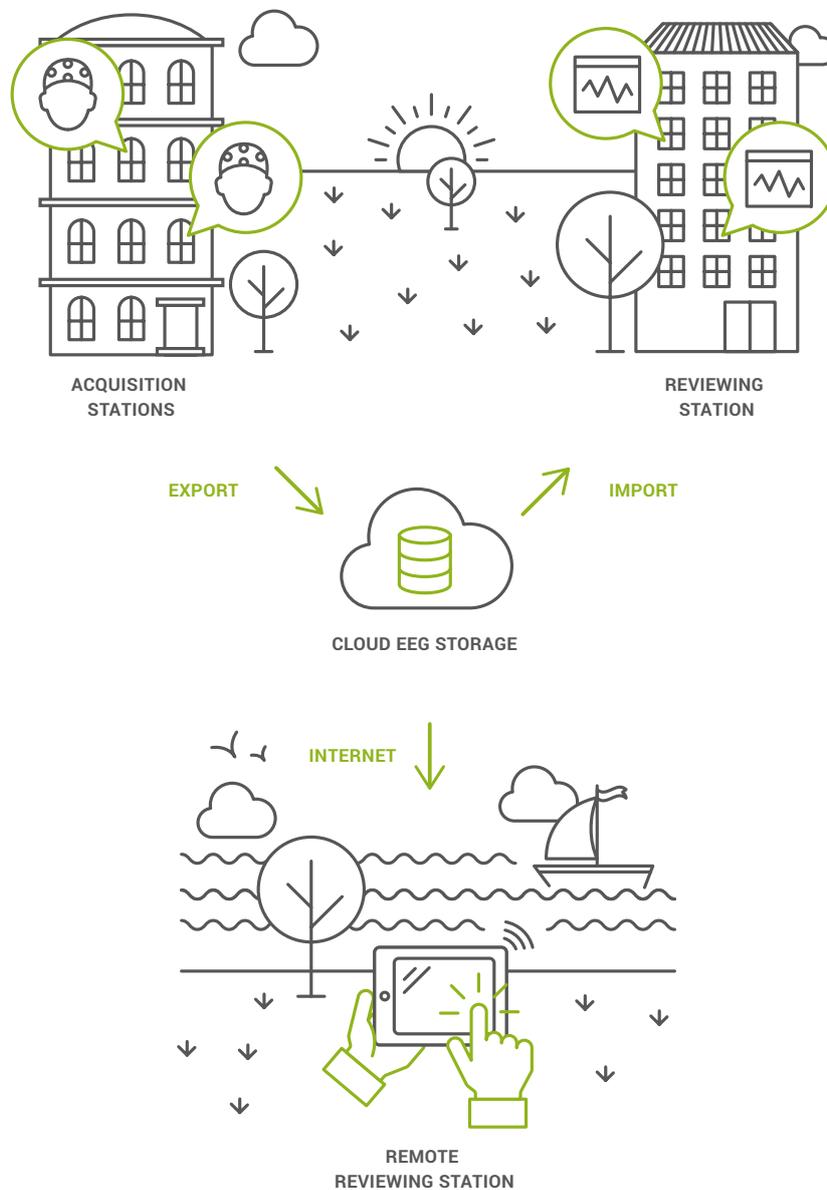
Automatically generated report of EEG study

# EEG Storage

EEG records are stored in the database which provides the advanced possibilities of structuring and search. Keep the archived records on the computer connected to the digital EEG system or on any remote computer (file server). Besides, archived records can be burned on any CD or DVD.

Neuron-Spectrum.NET can integrate with hospital network database via GDT and HL7 interfaces. The software allows operating with MDB, MS SQL, MySQL databases.

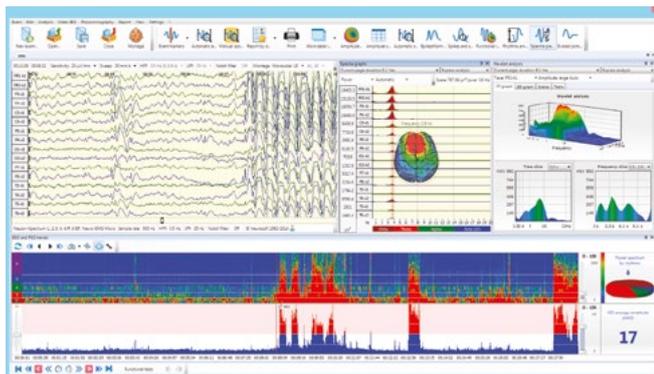
The exams can be exported to the external media in the following formats: EDF, BDF, PDF, RTF, TXT, XML, video clip, set of images. You can activate the automated export of exams to cloud storages to view them from anywhere in the world via Internet.



## Trend View

Neuron-Spectrum.NET software displays trends of spectrum components, EEG rhythm indexes, amplitude parameters of signals, HR, aEEG, etc. in any derivations.

In spite of the record duration the whole trend is displayed on one screen. You can switch to any fragment of the record from the trend window just with one mouse click!



Trends of EEG parameters

## EEG Printing

EEG is printed with standard grid and calibration cuts, with derivation names and acquisition parameters on any computer printer.

You can select EEG fragments to be printed in the process of acquisition or just after it is stopped.

## Dual-Monitor Operation Mode

Dual-monitor operation mode is more convenient to work with the software. The first monitor is used for review of EEG traces. The results of EEG analysis, exam report, images from video cameras, trends, etc. are displayed on the second monitor.

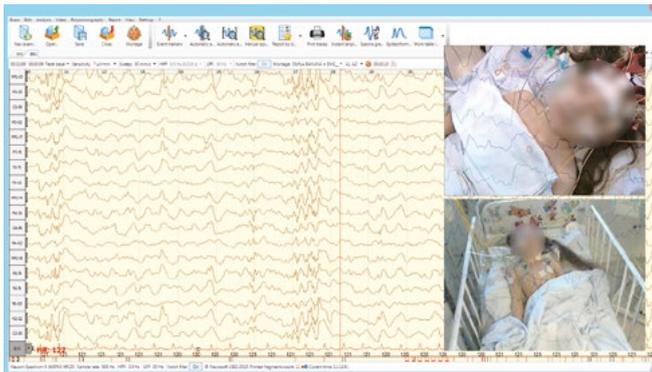


The second monitor can be used as a pattern-stimulator

# OPTIONS

## Neuron-Spectrum-Video

Neuron-Spectrum-Video software allows recording the long-term synchronous EEG, video and audio data using 1, 2 or 3 video cameras controlled from the computer. There are wide possibilities to review, edit and store the recorded data. The advanced network camera support is ensured.



Video EEG acquisition

## Neuron-Spectrum-PSG

Neuron-Spectrum-PSG software allows performing comprehensive polysomnography studies (manual sleep stage analysis, analysis of sleep-related disorders). Advanced search tools intended for detection of respiratory and snoring events, desaturation and limb movements during sleep help to analyze long-term night exams quickly and accurately. Sleep analysis results are presented as tables and graphs that can be copied to exam report.



Review and analysis of PSG

## Neuron-Spectrum-LEP

Neuron-Spectrum-LEP software allows recording long-latency auditory, visual and cognitive EP with brain mapping using both built-in and external stimulators. Cognitive EP can include such test types as P300, MMN, CNV.



Acquisition and analysis of long-latency EP using multi-channel scheme



## COMPREHENSIVE ASSISTANCE AND TECHNICAL SUPPORT



Our customers can always count on Neurosoft team for extensive support.



Together with digital system you get the detailed technical and user manuals.



We guarantee 24-month warranty for electronic units.



[www.neurosoft.com](http://www.neurosoft.com), [com@neurosoft.ru](mailto:com@neurosoft.ru)  
Phones: +7 4932 24-04-34, +7 4932 95-99-99  
Fax: +7 4932 24-04-35  
5, Voronin str., Ivanovo, 153032, Russia



December  
2017

**CAUTION:** Federal Law restricts this device to sale by or on the order of a practitioner licensed by the law of the State in which he/she practices to use or order the use of the device.