Neuron-Spectrum

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

25-, 21-, 19-, 16- and 8-Channel Digital EEG Systems

Digital EEG systems Neuron-Spectrum are modern high-tech electronic medical devices of high quality satisfying the most exacting requirements of wide circle of the customers starting from doctor in clinics and up to neurophysiologist-researcher.

High quality of EEG recording is achieved due to hardware and software solutions. The sampling rate of EEG signal is up to 5000 Hz per channel, A/D converter is 16 bits, at that the noise level is less than 0.3 μV.

The mathematical processing of the received data includes brain mapping, spectral, coherent, periodometrical analysis and automatic report generation. EEG is displayed on the computer screen with the resolution up to 2560×1600 pixels and is printed on the common paper. The impedance is indicated on the electronic unit front panel.

Options. Digital EEG systems **Neuron-Spectrum** can be supplied with the following options: polysomnography study; video monitoring; 3-D dipole localization of pathological activity sources (for EEG systems with the number of channels not less than 16); evoked potentials study; heart rate variability study; external unit for SpO_2 registration.

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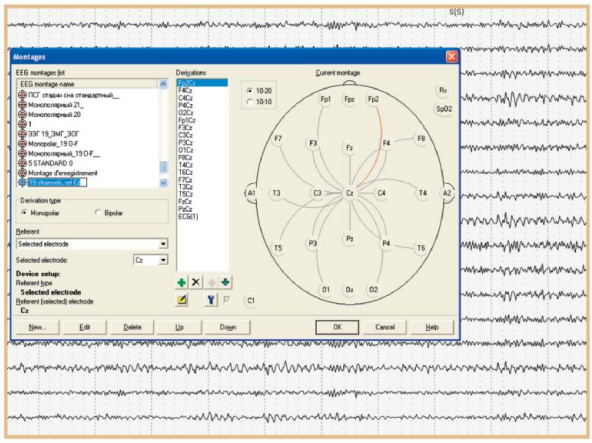
Medical Diagnostic Equipment Development and Manufacture

Features

EEG Sampling Rate is up to 5000 Hz, Noise Level is less than 0.3 μV

High sampling rate of the signal allows to register high-frequency signal components without typical "deglutition" of sharp EEG components or abrupt amplitude decrease.

The low noise level provides the possibility to apply the most sparing EEG filtration or do not carry out the filtration at all. It results in maximal saving of useful information in the initial signal.

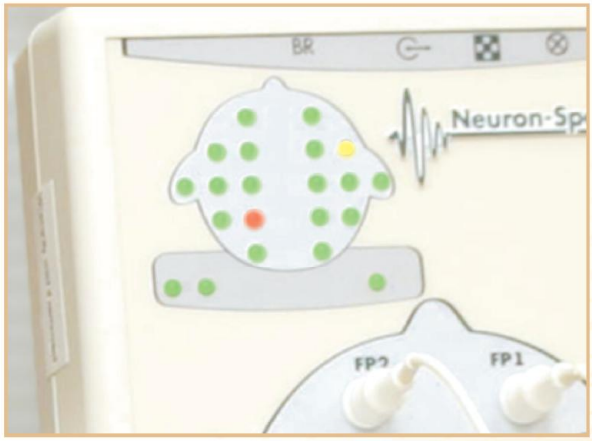


Any Electrode Can Be Used as a Referent One

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

Impedance Indication on the Front Panel

Impedance indication on the front panel is a considerable reduction of time required for a patient preparation for the checkup with the preservation of high registration quality.



Connector for Standard Electrode Cap Attachment

If you use the electrode cap, you will not have to use the adapters or other devices, it will be enough just to attach the cap to standard connector.

Touch Proof Connectors and Alligator Clips with Leads

The Touch proof connectors and the alligator clips compatible with most cables and electrodes are used for the electrodes connection.

Small Dimensions and Possibility to Operate in Unshielded Room

Digital EEG systems of **Neuron-Spectrum** series can be used in any convenient room. It results in considerable decrease of costs required for preparation of working place, increase of personnel convenience of operation and patient's comfort. The small device dimensions is a mobility, small expenses for forwarding.

Neuron-Spectrum Software Features

EEG Recording

Neuron-Spectrum software provides EEG recording on any digital EEG system of **Neuron-Spectrum** series by 8 – 32 channels (up to 64 digital derivations).

During the recording monopolar, bipolar or mixed montages in "10-20" and "10-10" schemes can be used. Any polygraphic channels (ECG, EMG, EOG, breath (airflow, chest and abdominal movements), breath noise (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 more high 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 checkups (photic stimulation, auditory stimulation, hyperventilation, eyes opening). Besides, you can perform other functional tests of any duration and in any sequence.

The flexible possibilities of stimulators programming are available.

You can watch the process of EEG recording both from the computer connected to the digital EEG system or computer connected to the same local network. After EEG recording termination, EEG can be reviewed in the "as recorded" mode as if it emulates the paper record.

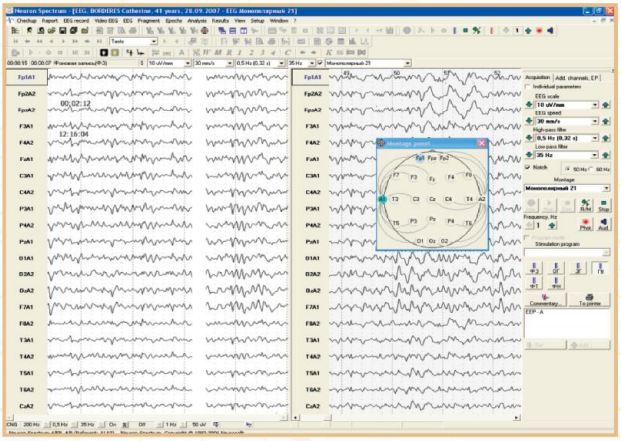
EEG Storage

The records are stored in the database which provides the advanced possibilities of structuring and search. The records archives can be stored on CD or DVD. If necessary to review the archive record, the software will inform the 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).

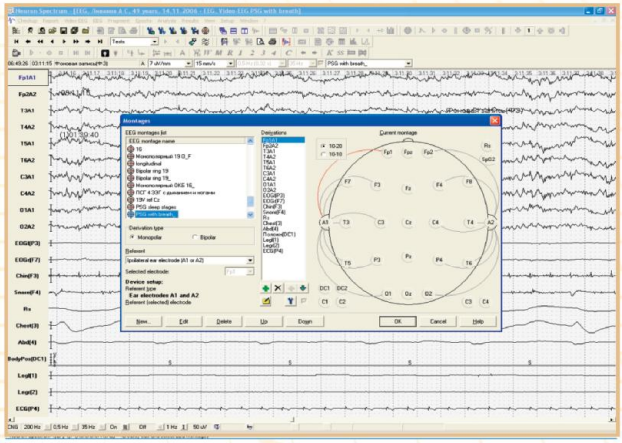
The software operates with standard network database via GDT and HL7 interfaces.

EEG Printing

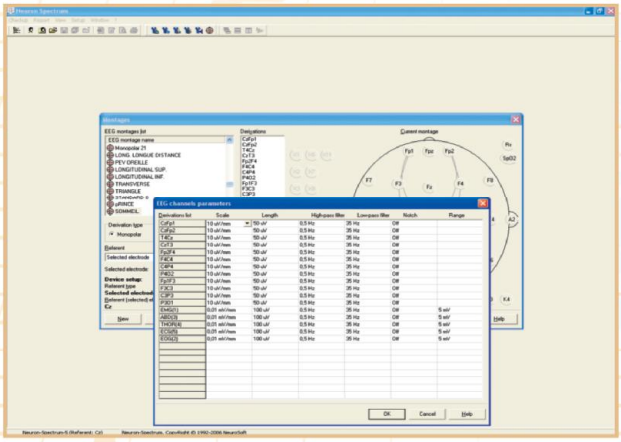
EEG with standard grid, derivations names, recording parameters can be printed on any computer printer. In the process of the recording you can mark EEG fragment which will be printed just after the recording termination.



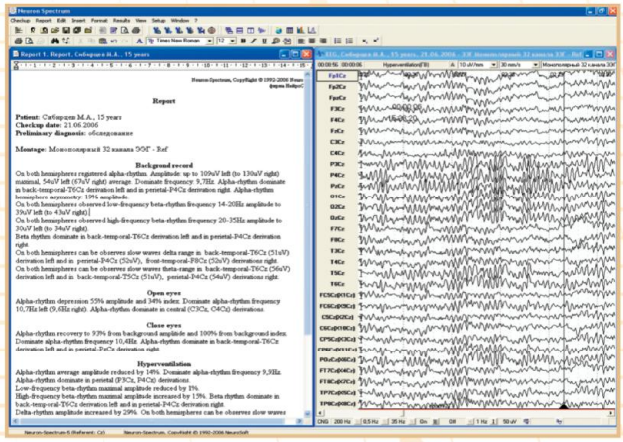
EEG recording mode.



EEG montages creation and editing.



Selection of individual parameters for any derivation.



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

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 EEG 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 the 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.

After EEG mathematical analysis the software allows creating the automatically generated EEG description in checkup report. Besides, the 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.

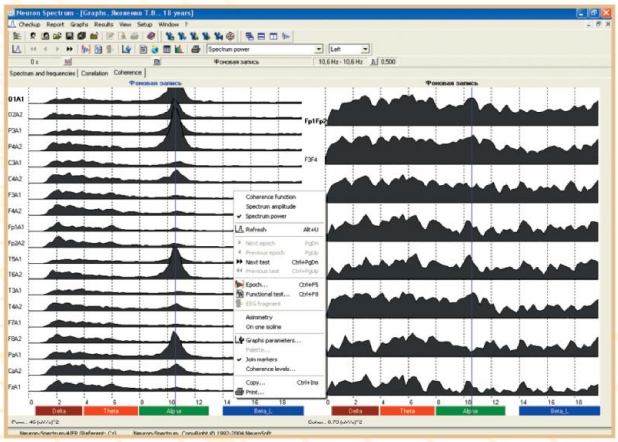
Trends Construction

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

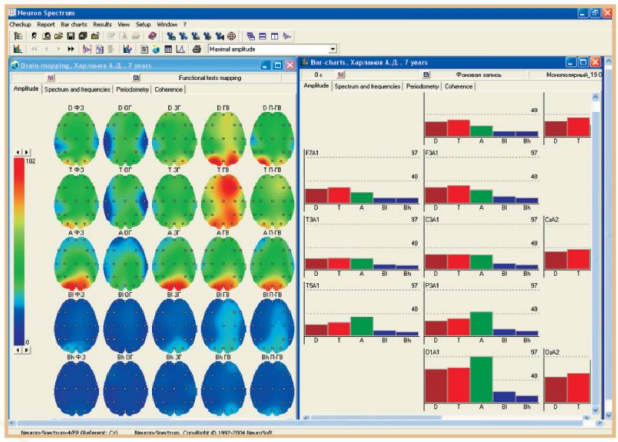
In spite of the record duration all the trend is displayed on the one screen. At that you can switch on any doubtful record fragment from the trend window by one mouse click!

Two-monitor Operation Mode

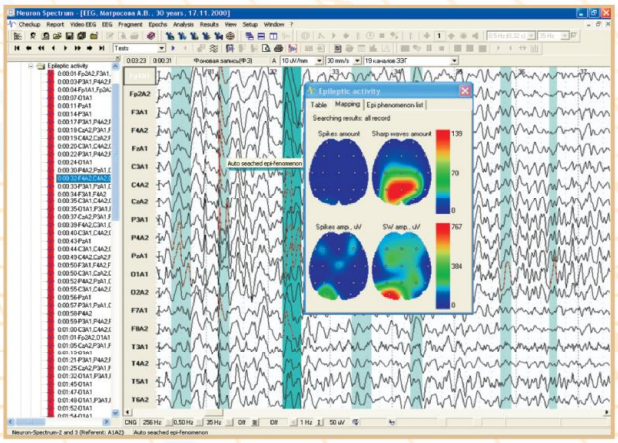
The program supports automatically two-monitor operation mode. At that the results of EEG analysis, checkup report, images from the video cameras, trends, etc. are represented on the second monitor which allows to use the first monitor for EEG displaying completely.



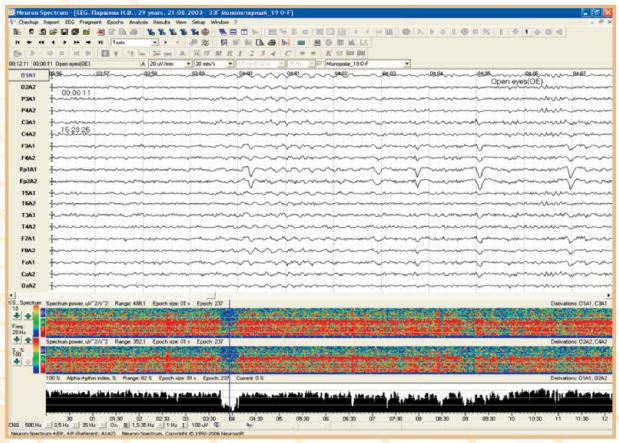
Graphs of EEG spectral and coherent analysis results.



Brain mapping and bar charts of EEG analysis results.



Automatic search of spikes and sharp waves.

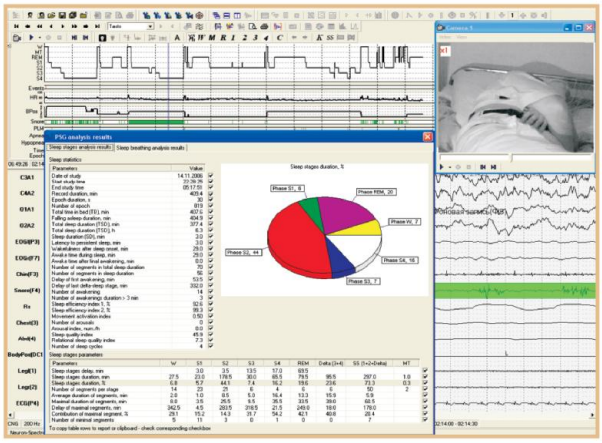


EEG parameters trends.

Optional Software

Neuron-Spectrum-PSG

Neuron-Spectrum-PSG software allows performing comprehensive polysomnography studies (sleep stage analysis, analysis of sleep-disordered breathing) on digital EEG system **Neuron-Spectrum-4/P**. All the rest models of **Neuron-Spectrum** series provide only sleep stage analysis.



Neuron-Spectrum-PSG.

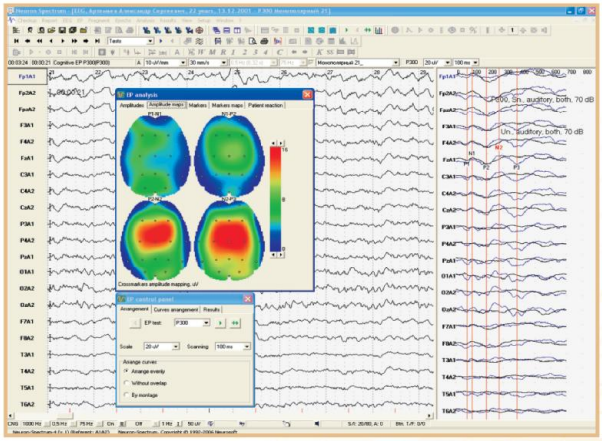
Neuron-Spectrum-Video

Neuron-Spectrum-Video software allows performing the long-term synchronous EEG and video recording from one or two video cameras controlled from the computer and audio information from one or two 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), somatosensory and cognitive (P300, MMN, CNV) EP using EEG channels (up to 21 ones) with brain mapping with the use both built-in and external stimulators.

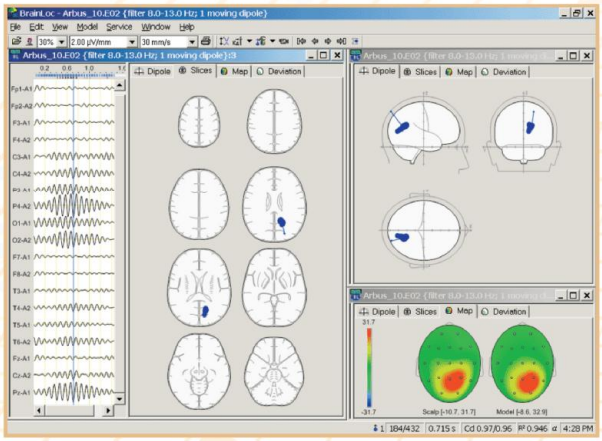


Neuron-Spectrum-LEP. Review and analysis of multi-channel EP.

BrainLoc Software for 3-D Dipole Localization of Pathological Activity Sources

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 potentials sources, wave patterns, rhythmic activity generators. It is recommended to use digital EEG systems with the number of channels not less than 16.

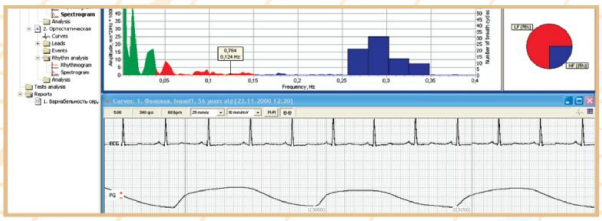
The visualization of localization results is performed on three head views, diagrammatic sectional views of the brain structures, MRT-images with the possibility of analysis results review of several records in multi-window mode.



BrainLoc. Multi-window visualization of pathological activity sources.

Poly-Spectrum-Rhythm

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



Poly-Spectrum-Rhythm.

Base Delivery Set

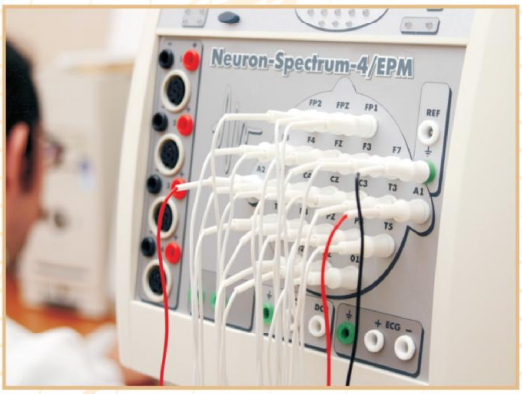
- Electronic unit
- Stand
- LED photic stimulator
- Stand for photic stimulator
- Set of accessories for EEG recording:
  - Bridge EEG electrode:
    · 25 pcs. (for **Neuron-Spectrum-4/P**)
    · 25 pcs. (for **Neuron-Spectrum-4**)
    · 23 pcs. (for **Neuron-Spectrum-3**)
    · 20 pcs. (for **Neuron-Spectrum-2**)
    · 15 pcs. (for **Neuron-Spectrum-1**)
  - Ear EEG electrode – 3 pcs.
  - Cable for bridge and ear EEG electrode:
    · 25 pcs. (for **Neuron-Spectrum-4/P**)
    · 25 pcs. (for **Neuron-Spectrum-4**)
    · 23 pcs. (for **Neuron-Spectrum-3**)
    · 20 pcs. (for **Neuron-Spectrum-2**)
    · 15 pcs. (for **Neuron-Spectrum-1**)
  - EEG helmet – 3 pcs.
    (sizes: 42-28, 48-54, 54-62)
- Software
- User manual
- Technical manual
- Transportation bag

See Also

Neuron-Spectrum-5.

Neuron-Spectrum-5

41-channel multifunctional digital EEG system for neurophysiological studies. **Neuron-Spectrum-5** provides the following features: 32 EEG channels (35 digital amplifiers); possibility of recording of any of 32 monopolar derivations of "10-10" system, 4 wide-band polygraphic channels for the recording of any signals from EOG up to short-latency EP/EMG, separate ECG channel, 2 direct current (DC) channels, SpO_2 channel*, breath channel.



Neuron-Spectrum-4/EPM.

Neuron-Spectrum-4/EPM

29-channel multifunctional digital EEG system for neurophysiological studies. It 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 registration, ECG channel, 2 direct current channels, breath channel. In base delivery set it allows to perform EEG studies, recording and analysis of multi-channel long-latency EP, study of short-latency auditory, visual, somatosensory and cognitive EP.

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

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