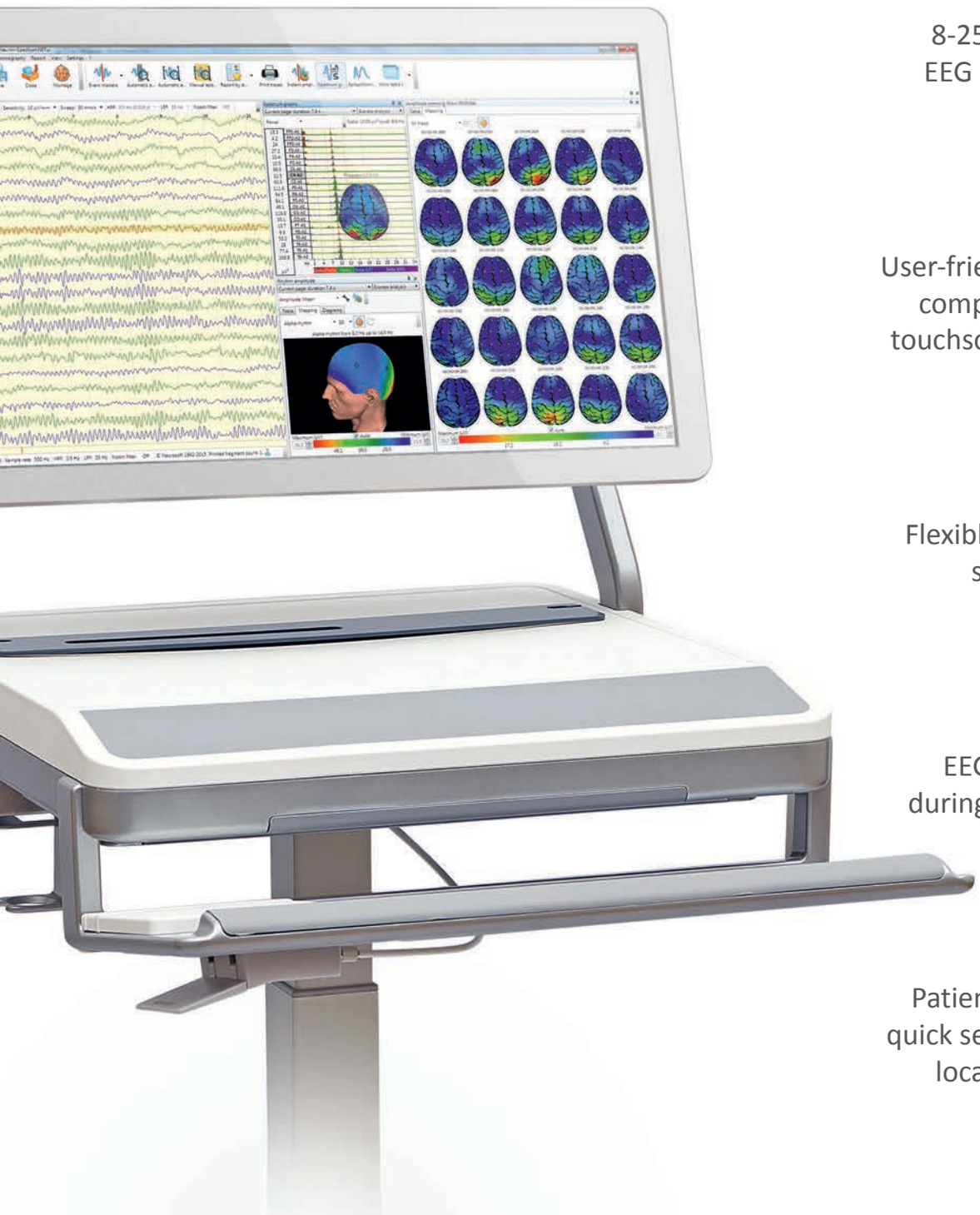
NEURON-SPECTRUM.NETω

Software for Neuron-Spectrum EEG Systems



- 8-256 channel EEG acquisition
- User-friendly interface compatible with touchscreen displays
- Flexible stimulator settings
- EEG analysis during acquisition
- Patient database: quick search, backup, local network

EEG

• Routine EEG • Video EEG
• PSG • EP • CFM • BFB

Neurosoft

SOFTWARE FEATURES

Neuron-Spectrum.NETω software is the result of more than 20-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.NETω a physician's right hand in daily clinical routine.

The flexibility of Neuron-Spectrum.NETω allows the software to fit with any user requirements from routine EEG acquisition to complicated scientific studies.

Neuron-Spectrum.NETω 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.NETω software ensures EEG acquisition on any EEG device of Neuron-Spectrum series by 8-256 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, EMG, EOG, airflow, chest and abdominal movements, snoring, body position, limb movements, SpO_2, CO_2, 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.

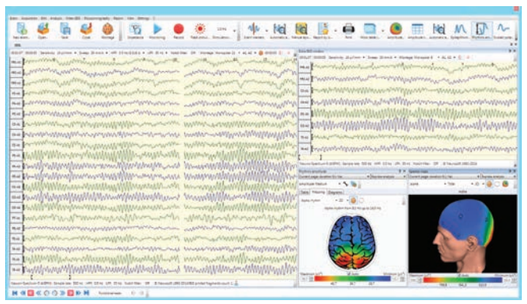
It is possible to set different parameters for different channels. For example, you can set ECG filters and scales different from those of EEG channels. Besides, you can adjust the parameters of any channel in the process of recording or during review and analysis.

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

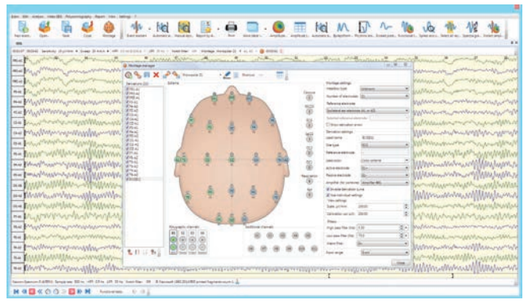
Neuron-Spectrum.NETω software allows performing the functional tests which are standard for EEG exams (background EEG, photic stimulation, auditory stimulation, hyperventilation, eye opening).

You can perform other functional tests of any duration and in any sequence. Automated recording of functional tests with audible notification for a patient is available.

Both built-in stimulators and external stimulators connected via USB or trig in/out (e.g., Neuro-MS/D magnetic stimulator) can be easily programmed.



EEG acquisition



Creation and editing of EEG montage

> 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.

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

Continuous impedance measurement is available during the acquisition. Review the measured impedance in any fragment of the record.

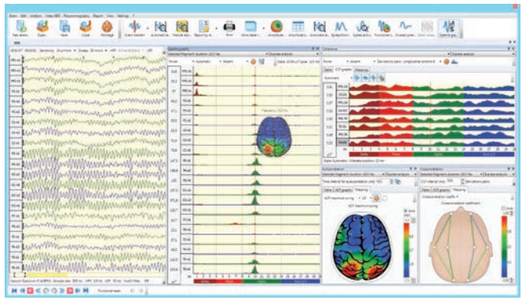
After the acquisition you can review EEG in the "as recorded" mode as if it emulates the paper record.

EEG Review and Analysis

Neuron-Spectrum.NETω 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.

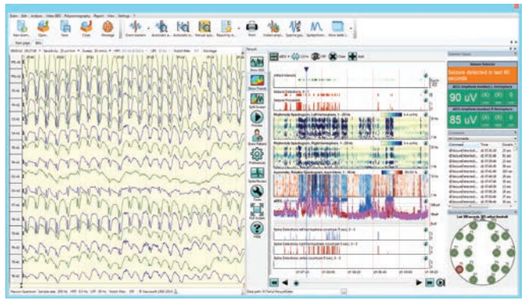


Graphs of spectral and coherence EEG analysis results

Brain mapping and bar charts of EEG analysis results

Brain Mapping. The software allows 2- or 3-D 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.

In interaction with Persyst[1] and LORETA[2] programs, Neuron-Spectrum.NETω allows performing 3-D localization of pathological electrical activity sources. While working with NINDEX[3] software Neuron-Spectrum.NETω can be used as anesthesia depth monitor.



Working with Persyst

> The software allows performing EEG amplitude, spectral, periodometric, coherence and cross-spectral analysis.

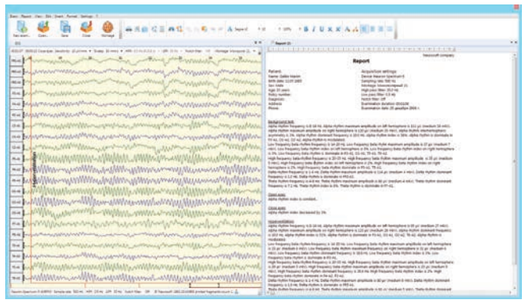
Working with LORETA

The modern analysis techniques, such as Wavelet-analysis, bispectrum analysis, independent component analysis (ICA) are also implemented in the program.

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

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 arbitrary reports.

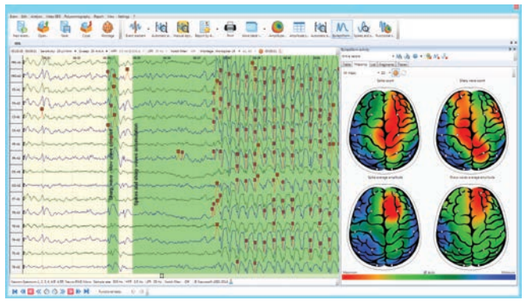


Automatically generated report of EEG study

1 *Persyst Development Corporation*
2 *University of Zurich*
3 *Controles S.A.*

Automatic Detection of Paroxysmal Activity

In Neuron-Spectrum.NETω the detection and marking of spikes, sharp waves and seizures are done automatically. As the result, the software shows the list of the detected phenomena and mapping of these phenomena distribution on scalp. When spikes or other epileptiform activity are detected during the recording, the program displays a special notification and sends its copy to predefined e-mail address. In this case any stimulation stops and the recorded video fragment is marked to be saved in the exam.

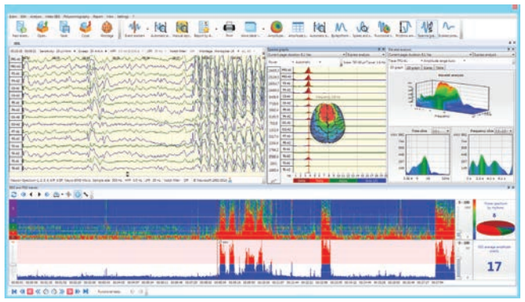


Automatic detection of spikes and sharp waves

Trend View

Neuron-Spectrum.NETω software displays trends of spectrum components, EEG rhythm indexes, amplitude parameters of signals, HR, number and amplitude of epileptiform activity phenomena, aEEG, etc. in any derivations.

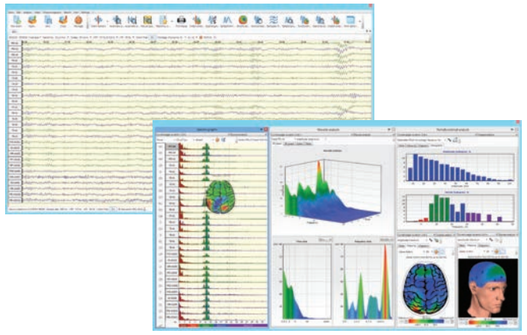
In spite of the record duration the whole trend is displayed on one screen. You can switch to any fragment of the record from the trend window just with one mouse click!



Trends of EEG parameters

Two-Monitor Operation Mode

Two-monitor operation mode is more convenient to work with the program. 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.

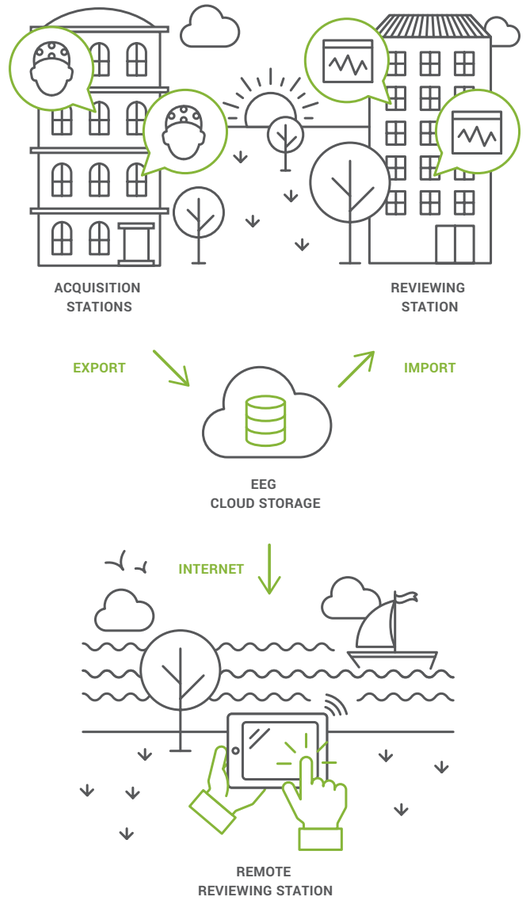


EEG Storage

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.NETω 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.

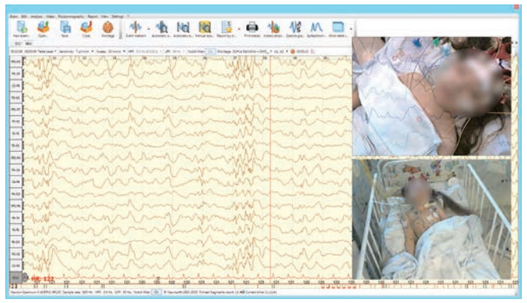


Distributed access to exams

OPTIONS

Neuron-Spectrum-Video

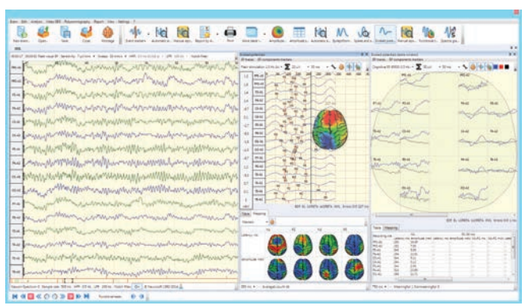
Neuron-Spectrum-Video software allows performing the long-term synchronous EEG and video recording from 1, 2 or 3 video cameras controlled from the computer and audio information from 1 or 2 microphones. There are wide possibilities to review, edit and store the recorded data. The support for advanced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



Video EEG acquisition

Neuron-Spectrum-LEP

Neuron-Spectrum-LEP software allows recording long- and middle-latency auditory, visual, somatosensory and cognitive EP by EEG channels with brain mapping using both built-in and external stimulators. Cognitive EP can include such test types as P300, MMN, CNV, GONOGO, TOVA, VCPT. With the special stimulation software Presentation[4] the number of tests can be enlarged.



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

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.

Neuron-Spectrum-PSG

Neuron-Spectrum-PSG software allows performing comprehensive polysomnography studies (sleep stage analysis, analysis of sleep-disordered breathing). Automated or manual tools for sleep staging can be used. 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. The automatic detection and analysis of cardiac events during sleep is also available. Sleep results are presented in tables and graphs that can be copied to exam report.

Review and analysis of PSG

Neuron-Spectrum-EMG[5]

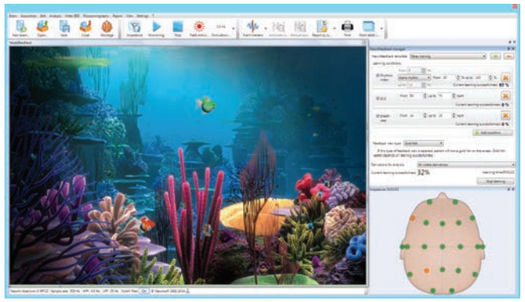
The specifications of 4 polygraphic channels of Neuron-Spectrum-5, Neuron-Spectrum-4/EPM allow performing the comprehensive EMG studies by the following techniques:

- Nerve conduction study (NCS) (motor and sensory nerve conduction study, F-wave, H-reflex (including paired stimulation), motor and sensory inching)
- EMG (spontaneous activity, interference curve, motor unit potentials)
- Neuromuscular junction (repetitive stimulation, jitter)
- Additional EMG techniques (blink reflex, sacral reflex, bulbocavernous reflex, T-reflex[6], galvanic skin responses)
- Transcranial magnetic stimulation[7]

The digital system can be supplied with the dedicated keyboard and footswitch to increase the performance.

Neuron-Spectrum-BFB

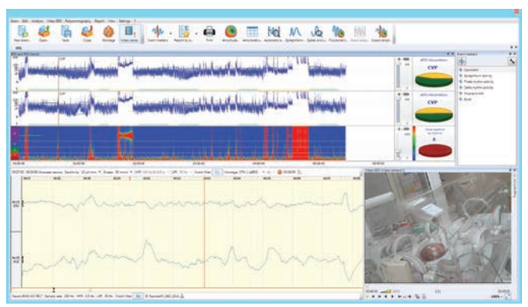
Neuron-Spectrum.NETω software can be used in trainings in accordance with various biological feedback protocols. You can use predefined training protocols or create your own ones. EEG rhythm indexes, HR, BR, EMG and GSR amplitude can be considered as training parameters. Video, audio information and games can be presented to a patient as feedback.



Neuron-Spectrum-BFB module

Neuron-Spectrum-CFM

Neuron-Spectrum-CFM software is intended for long-term cerebral function monitoring in neonatology to detect possible structural and functional brain changes in newborns. The cerebral function monitoring can also be prescribed to adults in intensive care units (ICUs). This technique can be helpful in monitoring of treatment efficacy and response prediction. aEEG trend allows detection of epileptiform activity (including masked epileptic seizures) and evaluation of its intensity and frequency. The function to assess patient's pain during needle insertion is also available.



aEEG acquisition in neonatology

4 *Neurobehavioral Systems, Inc.*

5 *For Neuron-Spectrum-4/EPM, Neuron-Spectrum-5*
6 *If tendon hammer is available*
7 *If magnetic stimulator is available*

OPTIONS 2

Neuron-Spectrum-ERG[8]

Neuron-Spectrum-ERG software is intended for electro-retinography studies.

Neuron-Spectrum-EP[9]

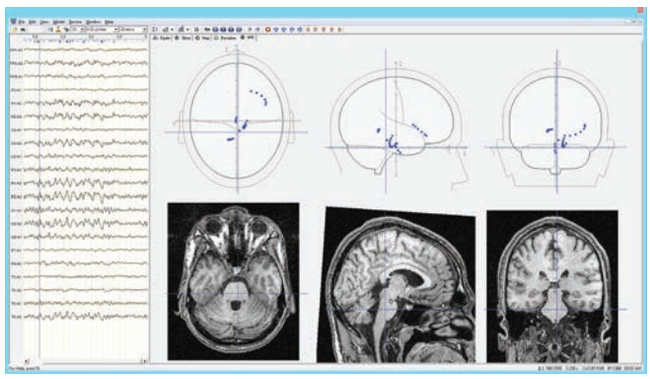
Neuron-Spectrum-EP software provides the possibility to study short-, middle-, and long-latency auditory, visual, somatosensory and cognitive EP by 4 wide-band polygraphic channels.

Poly-Spectrum-Rhythm/EEG

Poly-Spectrum-Rhythm/EEG 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 system.

BrainLoc[10]

BrainLoc software is intended for 3-D dipole localization of pathological activity sources when suffering from epilepsy, injuries, strokes, 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 allow reviewing the analysis results of several records in multi-window mode.



Working with BrainLoc

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 including even the most particular EEG aspects.
- ✔ We guarantee 24-month warranty for electronic units and lifetime software update.

Neurosoft

www.neurosoft.com, 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

8 For Neuron-Spectrum-4/P, Neuron-Spectrum-4/EPM, Neuron-Spectrum-5
9 For Neuron-Spectrum-4/EPM, Neuron-Spectrum-5
10 A. A. Mitrofanov, Private Entrepreneur