

# Electroencephalograph-recorder “Encephalan-EEGR-19/26”



- portable • modular • transformable •

- Continuous EEG monitoring
- Autonomous EEG record (Holter-EEG)
- Mobile or stationary variants (more than 50 channels, including 30 EEG)
- Synchronous video-EEG monitoring (for epileptology and somnology)

## Wireless modules

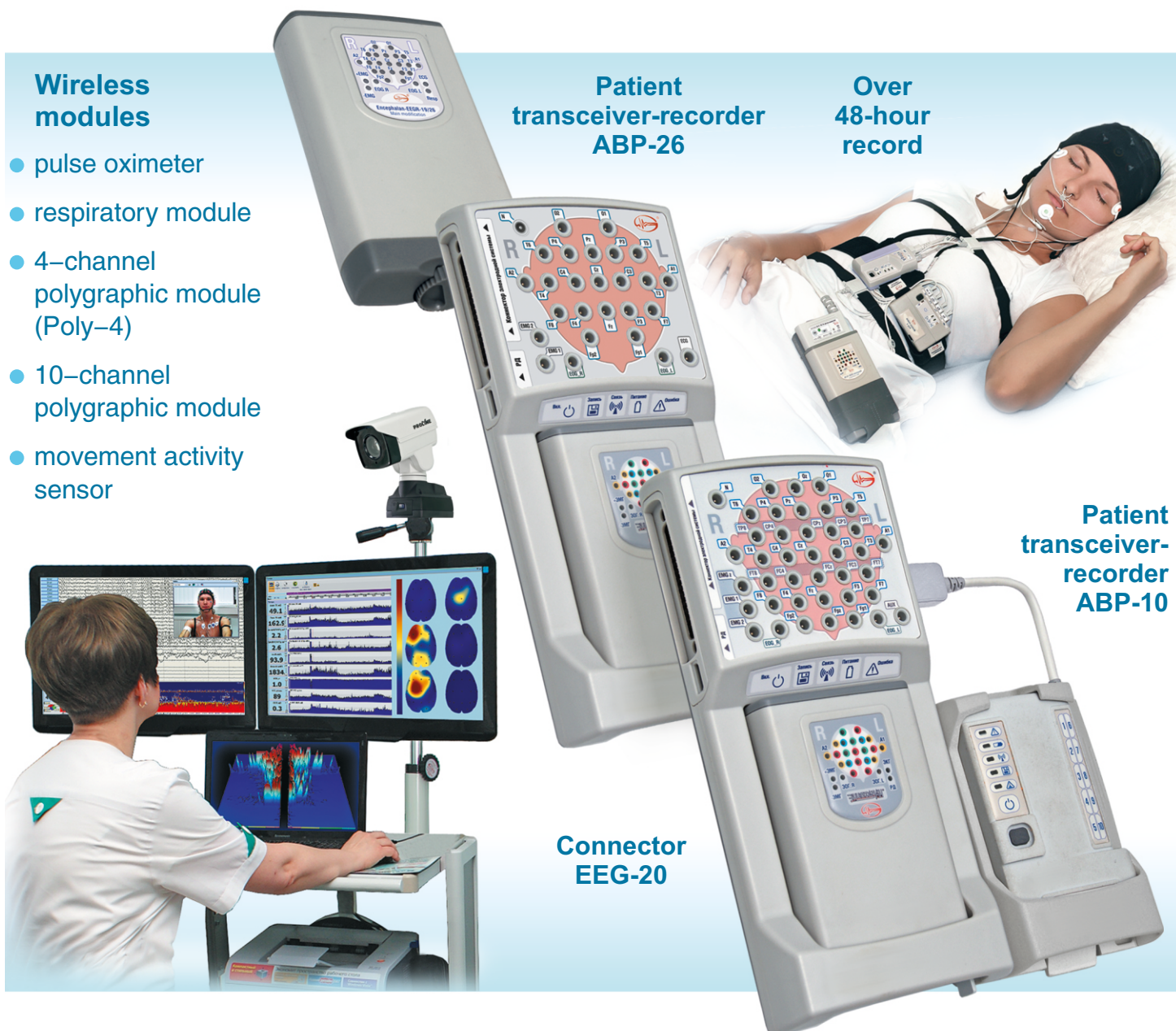
- pulse oximeter
- respiratory module
- 4-channel polygraphic module (Poly-4)
- 10-channel polygraphic module
- movement activity sensor

Patient  
transceiver-recorder  
ABP-26

Over  
48-hour  
record

Patient  
transceiver-  
recorder  
ABP-10

Connector  
EEG-20



**Multichannel multiparameter record,  
additional software provide use of electroencephalograph-recorder  
as a multifunctional neuromodular diagnostic system**



[www.medicom-mtd.com](http://www.medicom-mtd.com)

Taganrog

## MEDICOM MTD

Research & Development Limited Company



## Mobile, telemetric or autonomous (Holter-EEG) use of the electroencephalograph

- For EEG studies in the hospital room, emergency room, and intensive care or at patient's home, the mobile set includes a patient transceiver-recorder, a phono-photo stimulator, a set of electrodes, a portable PC and it easily fits in a compact computer carrying bag.

- Additional mobile kit for synchronized long-term EEG-video monitoring provides effective use of portable electroencephalograph in telemetric mode for differential diagnosis of epilepsy.

- The ability to record EEG (over 48 h) on the memory card built into autonomous patient transceiver-recorder ABP-26, provides carrying out of a comfortable long-term outpatient EEG study in environment natural for the patient during active wakefulness or sleep.

Set of electrodes  
"Encephalan-ES"

The unit of  
stimulation control –  
a photostimulator



**Sets of EEG electrodes "Encephalan-ES" are used for long-term comfortable registration of EEG via 6, 11 and 20 derivations, in versions "baby", "child" and "adult"**

### Continuous EEG studies in environment natural for a patient may be effective for:

- Evaluation of psychogenic disorders of undefined genesis, which are manifested under conditions of natural environment and behavior.

- Detection of pathological manifestations, such as paroxysmal epileptic states, transient ischemic attacks, and others.

- Differential diagnosis of epilepsy, especially in irregular and ill-defined paroxysm.

- Control in drugs administration.

For long-term comfortable registration of EEG via 32 derivations, you can also use kits MCScap with CLINIC or SLEEP variant with a group connector DB25 and dimensions:

XL (60-66cm)  
L (54-60cm)  
M (48-54 cm)  
S (42-48 cm)  
XS (36-42 cm)

Manufacturer of kits  
LLC "Medical  
computer systems"  
[www.mcscap.ru](http://www.mcscap.ru)



When ordering directly at the manufacturer's, it is necessary to specify a variant of use - with the electroencephalograph-recorder "Encephalan-EEGR-19/26"



## The main characteristics of the electroencephalograph-recorder:

The patient transceiver-recorder ABP-26 has 20 channels for standard EEG derivations with simultaneous registration of extra low brain activity and electrode resistances, and 6 additional polygraphic channels for registration of ECG, EMG, EOG, breathing, body position of the patient.

The additional transceiver-recorder ABP-10 increases the number of channels for 10 EEG derivations or for 10 different sensors and electrodes.

**The software for EEG-studies "Encephalan-EEGR" ("elite" suite) provides main functional capabilities of electroencephalograph-recorder**  
[see further in this brochure](#)

### Technical characteristics of the patient transceiver-recorder ABP-26 and ABP-10 during EEG registration:

- |                                      |                                  |                                |                 |
|--------------------------------------|----------------------------------|--------------------------------|-----------------|
| ○ AD converter:                      | 24 bit;                          | ○ Low pass filter (LPF):       | 15; 30; 70 Hz;  |
| ○ Sampling rate:                     | 2 kHz per channel;               | ○ Extra-low noise level:       | 0,23 $\mu$ V;   |
| ○ Allowable input DC offset voltage: | at least $\pm 300$ mV;           | ○ Common-mode rejection ratio: |                 |
| ○ Sensitivity:                       | 0,1-200 $\mu$ V /mm (21 stages); | powering from accumulator -    | at least 140 dB |
| ○ Input resistance:                  | at least 200 M $\Omega$ ;        | powering from USB-adaptor -    | at least 120 dB |
| ○ High pass filter (HPF):            | 0,016–16 Hz;                     | ○ Weight of ABP-26: 400 g      | ABP-10: 200 g   |



## Stationary use of electroencephalograph-recorder "Encephalan-EEGR-19/26"

32 EEG channels



For stationary use of the electroencephalograph for registration of EEG, connector EEG-20 is used for 20 EEG derivations (system "10-20"), or for 30 derivations with additional 10 EEG channels.

The study requires:  
electrode systems  
"Encephalan-ES" or similar  
connected to electrode  
system connector;  
MCScap kits for  
32 EEG derivations;  
single EEG electrodes of  
various types connected to  
the slots of a touchproof  
connector.

20 EEG channels



### Electrode sets for EEG studies



Set of 25 EEG electrodes, 4 ear clips and caps of rubber straps of 3 sizes.

Cup EEG electrodes



Cup adhesive EEG electrodes



Bridge snap electrodes

### Patient transceiver-recorder ABP-26 inserted into EEG-20 connector

Electrode system connector

Connector of respiratory effort sensor

Power button and state indicators of ABP-26

LED-indicators of electrodes contact quality

Informational panel

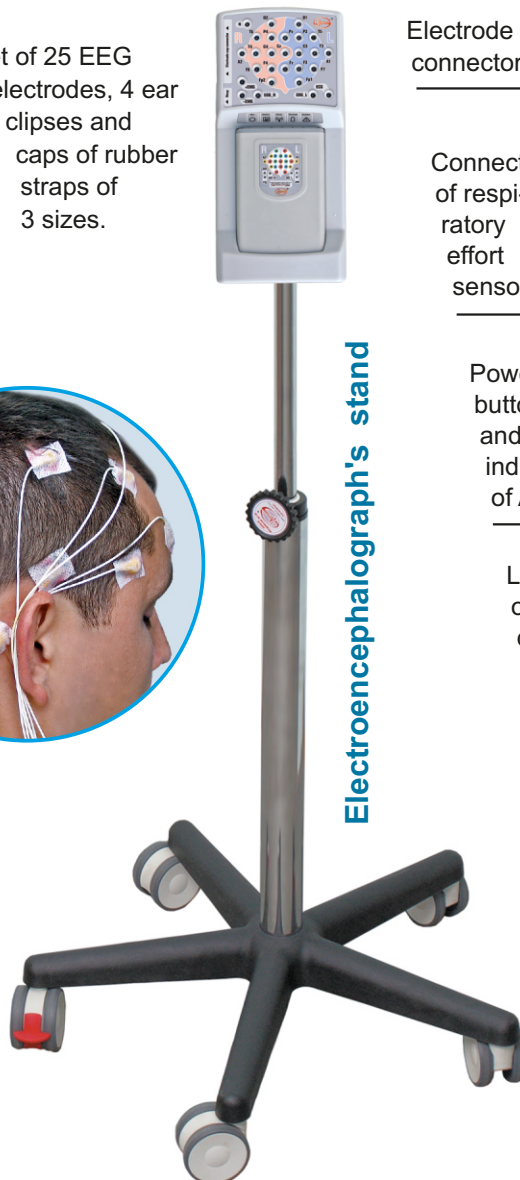
Quick connect or disconnect of ABP-26 with connector EEG-20

### Wireless Stimulator (autonomous photostimulator)

- Compact unit is combined with the LED matrix for the photostimulation for functional tests.
- The unit has autonomous battery power supply.
- Control is performed from the doctor's PC via wireless channel.



Electroencephalograph's stand





Version  
"Encephalan-EEGR-19/26"  
AT-PSG-Video-Poly

[illegible]

*Detailed information on possible sales package of electroencephalograph-recorder, wireless devices, sensors and accessories is given in additional illustrated catalogue.*

**The main trans obtaining data information onto int working mode channel to the**

- electroencephalogram (EEG)  
(up to 30 derivations),
- DC-potential level in EEG derivations,
- electrocardiogram (ECG)  
(up to 3 derivations),
- electromyogram (EMG),
- envelope EMG (EEMG),
- electrooculogram (EOG)  
(up to 2 derivations),
- respiratory effort  
(abdominal and thoracic),
- breathing airflow (nasal, oronasal),
- snore,
- body position,
- movement activity,
- tremor,
- oxygen saturation (SpO<sub>2</sub>),
- skin conductance (EDA),
- galvanic skin response,
- photoplethysmogram (PPG),
- temperature,
- impedance-based pneumogram,
- impedance-based encephalogram,
- impedance plethysmogram  
(central hemodynamics),
- stabilogram,
- wetness,
- illumination, etc.

Patient transceiver-recorder  
ABP-26 (1) with electrode  
system ES-EEG-19-3 (2)

### Pulse oximeter module (3)

## Wireless respiratory sensors module (WRS)

Module  
Poly-10 (4)

Module Poly-4

Cardiorespiratory  
module PG-ECG (5)

## Wireless movement activity sensors

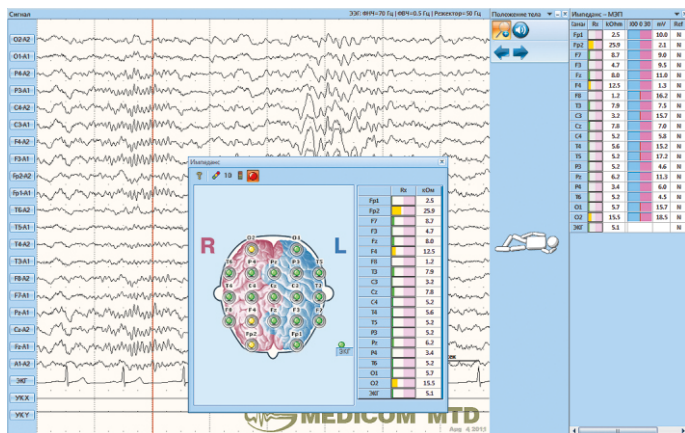
The main transceiver-recorder ABP-26 provides EEG record, obtaining data from wireless devices and sensors with saving information onto internal memory card during autonomous (Holter-type) working mode or provides data transition via wireless Bluetooth® channel to the personal computer during study carrying out.



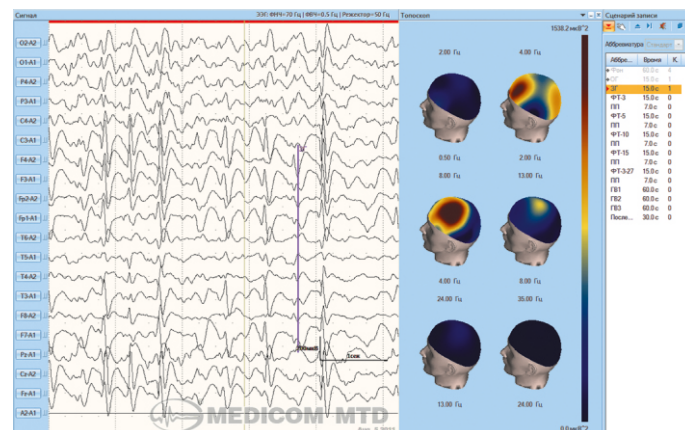
## Main software features

### EEG registration and visual analysis

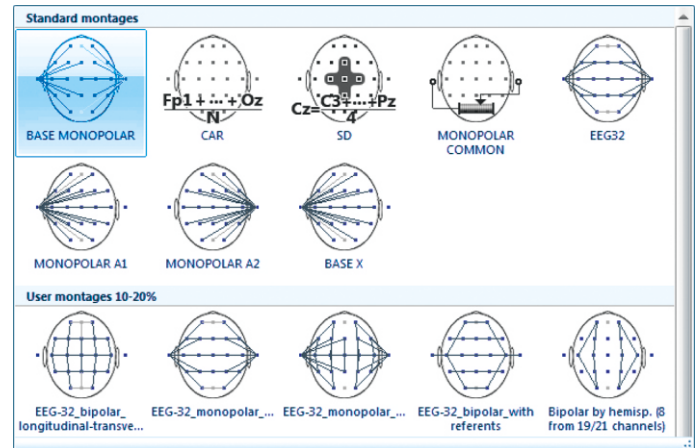
- Recording and visualization with high resolution of up to **64 digital EEG derivations**, software control of phono- and photostimulation.
- **Channels configuration** (up to **45**) includes a list of types of channels and their quantity, as well as the signal filter settings individually for each channel (HPF, LPF, rejector).
- **EEG montages** are stored in a special expandable library (**over 40 montages**). The **montage editor** allows changing the existing montages or creating new ones. Virtual (with option of returning to initial state) montage changing is available both during EEG recording and analyzing.
- The **record scenario** determines the sequence of hardware and software functional tests, as well as the configuration of stimulators.
- **Study profile library** includes common profiles of the study carrying out, including the **channels configurations**, the **montage and record scenario**. There is an option of changing profiles and creating new ones.
- **Impedance and potentials (DCp) control** during electrodes attachment. The values are recorded along with the EEG during real time record and used for subsequent analysis.



Electrode impedance measurement



To specify parameters of spatial distribution of spectral parameters of EEG activity, the application uses the mode of 3D and 2D topographic mapping ("toposcope").



Montages library



**Elimination of noise pick-up using another montage.**

**Split mode demonstrates:**

on the left – artifact from A1 reference in the left hemisphere channels, on the right – elimination of artifacts by applying "Monopolar A2" montage.

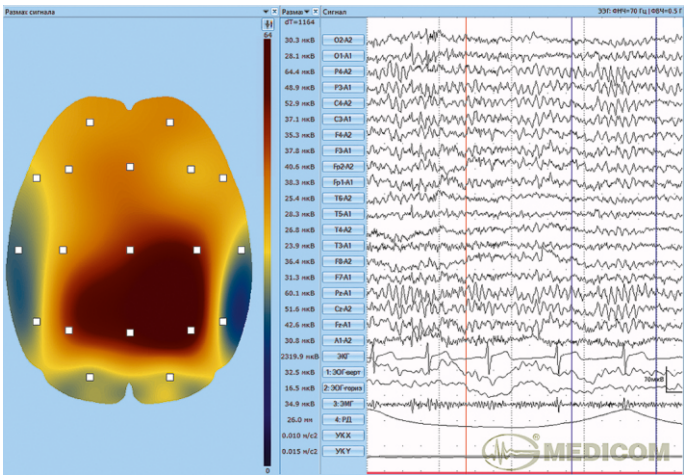
- Using the **"microscope"** tool, you can view any signal zoomed in, measure its amplitude on selected fragment, and also estimate the frequency characteristics of a signal.
- **Manual and automatic setting of markers** of various types while EEG recording, performing tests and subsequent analysis.
- **Markers** set during the study are displayed on a special list indicating the type and time of setting. The selection of the marker allows the user to visualize the corresponding fragment for analysis.
- **Split mode** (splitting screen into 2 or more parts) allows viewing data of one study (the one part may demonstrate the current record process, the other one – previously recorded EEG), or several studies, including an option of presenting results and their math analysis in various forms.
- The application supports **2 or more monitors**, which allows distributing visual information in the most optimal way for effective EEG study. The main monitor displays native signals, others – results of math analysis in different forms, trends, video from cameras (up to 4), etc.
- **EEG study** carrying out **control** from a remote computer via **Ethernet**.



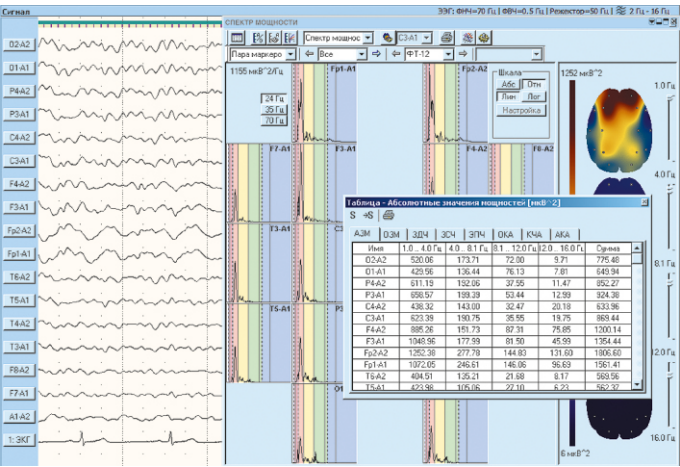
Main software features

Quantitative methods of EEG analysis

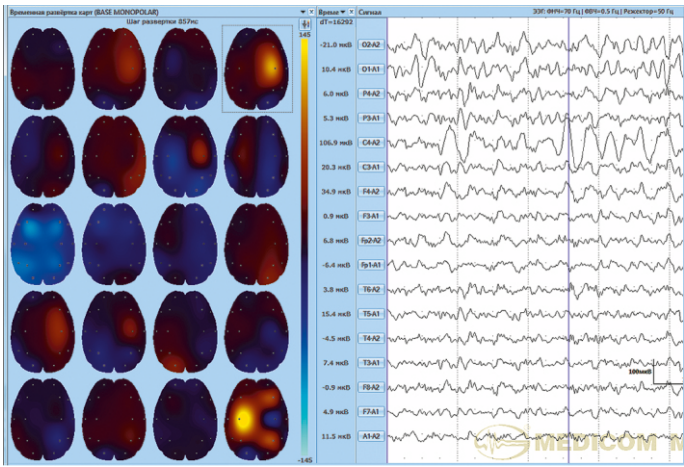
- For EEG analysis, most of the generally accepted mathematical treatments are used: power, amplitude spectrum, cross-spectrum, periodometric analysis, coherence functions, auto- and cross-correlation with the formation of tables of quantitative indicators and their topographic mapping.
- Mathematical processing can be performed for the selected EEG fragments of various duration or required frequency range.
- Automatic detection and marking of fragments of non-stationarities or epileptiform activity are performed during recording and EEG processing. Detected fragments are highlighted, saved and available for quick search for expert evaluation.



Amplitude mapping in post-real time

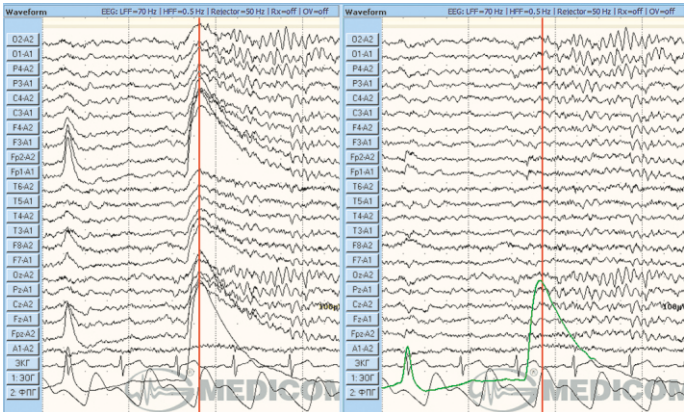
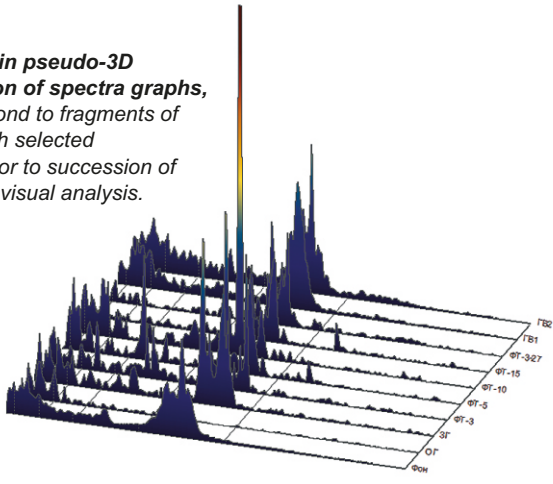


Analysis results are presented in the form of graphs, tables and topographic maps

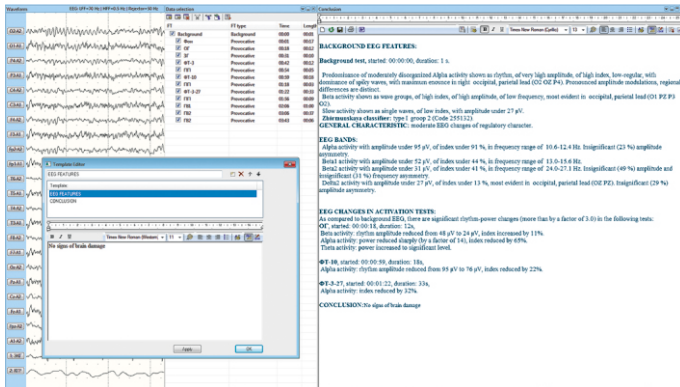


Amplitude mapping with presenting in "sweep" form of maps with set time rate

Presentation in pseudo-3D the succession of spectra graphs, which correspond to fragments of EEG study with selected time quantum or to succession of various FT for visual analysis.



In the split mode, on the right – the result of automatic artifact suppression from EOG by 2 channels (vertical and horizontal components of eye movements)



Report editor

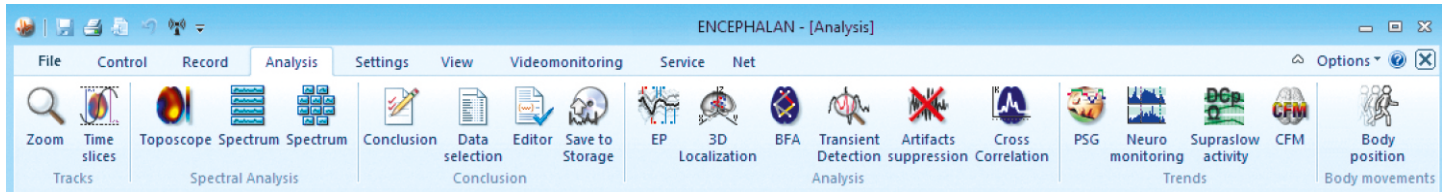
- Registration of ECG, EOG and EMG synchronously with the electroencephalogram allows performing automatic suppression of possible artifacts associated with cardiosignals, eye movements and muscle activity, the analysis of independent components is also used for the suppression of artifacts.
- Automatic formation of neurophysiological conclusions based on the description of the selected background and comparison of its characteristics with the selected EEG fragments, using the built-in text editor and glossary containing typical phrases preformed by the doctor.



## Main software features

### ● Ergonomic interface Ribbon of "Encephalan" software

Software "Encephalan" uses updated ergonomic interface "Ribbon" similar to MS Office 2007/2010 interface, in which menu elements and buttons are grouped in tabs for their functional purpose. This allows a user to switch the tabs with buttons in order to optimize the number of control elements according to qualification level or type of performed studies.



Ribbon tab "Analysis" gives wide range of opportunities for data processing of both the main software "Encephalan-EEGR" and additional software.

### ● EEG print options

Convenient preparation and printing of informative EEG fragments, results of processing in tables and graphs, conclusions on a study with a specific Print Manager tool.

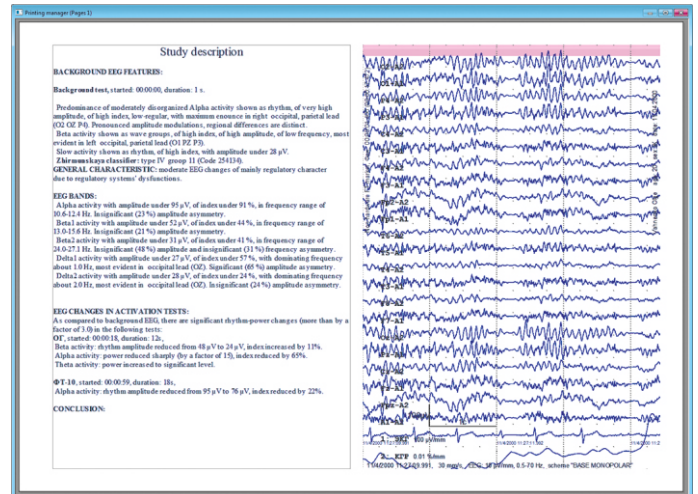
### ● EEG records storage

Storage of studies in a database "Cardfile" with an option of export and import of studies, and archiving of data on a variety of external media. There is an option of arrangement of the "Cardfile" database in the network on a dedicated server.

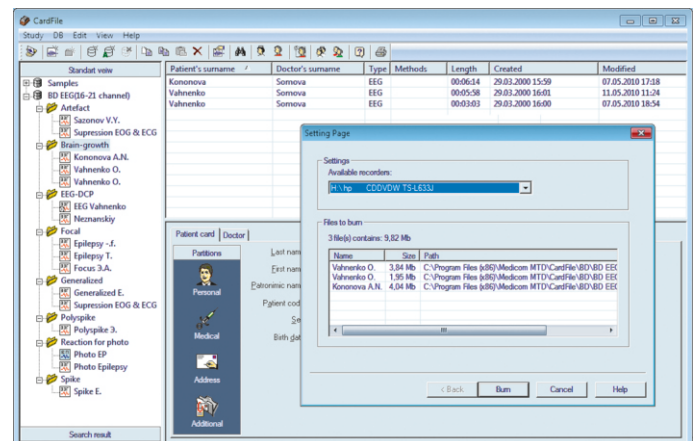
### ● Viewing study results on any computer (without installed "Encephalan" software)

Specialized application "Encephalan-EEG-Viewer" is uploaded onto any external data storage in addition to recorded EEG study for results exchange among specialists and to hand out the results to the patient in order to get an independent medical consultation or prepare presentations and reports. The software provides autonomous visual EEG analysis (data viewing, montage, scaling and selection of EEG signals) on any third-party computer.

There is an option of creation videos with informative fragments of the study (in common \*.avi format), which can be viewed by standard players such as Windows Media or CD / DVD-player.

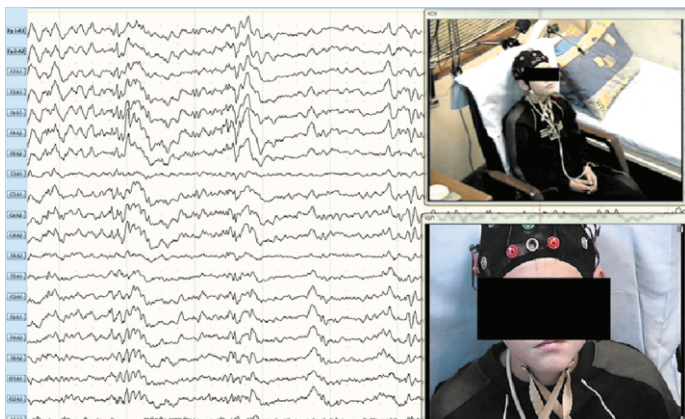


Print Manager



Database "Cardfile"

## Additional EEG-Videomonitoring Kit and "Encephalan-Video" software



Detailed information see in a specific brochure

The kit (mobile, stationary or autonomous) contains network (Ethernet, WiFi) day and night video cameras with IR illumination and switching of camera mode "day" to "night", and the software "Encephalan-Video".

Synchronization accuracy of EEG signals with video data during recording and playback is 1 frame.

Simultaneous viewing of video and EEG-record during monitoring or subsequent analysis can be performed on one or two monitors.

All recorded data can be stored on a variety of media (built-in or removable memory card, including hard drives of large capacity), in the PC database (Cardfile).

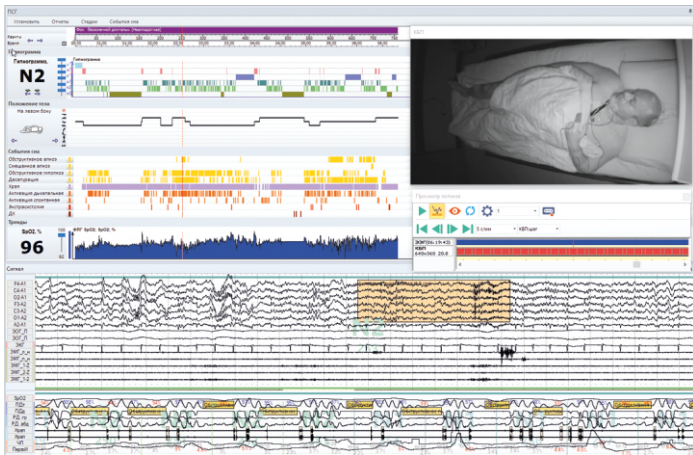


## Additional software and functional capabilities

- **"Encephalan-FBA"** provides visualization of intercentral connections map basing on the calculation of mutual functions (cross-correlation, cross-spectrum, coherence function) in order to diagnose inter- and intrahemispheric interaction during different types of action.

- **"Encephalan-VLFA"** software for analysis of very low frequency activity. Trends of very slow potentials dynamics and topographic maps of instant values and reactive changes of DC-potentials' level to functional tests carried out allow evaluating indirectly the cerebral energy exchange and metabolic changes dynamics.

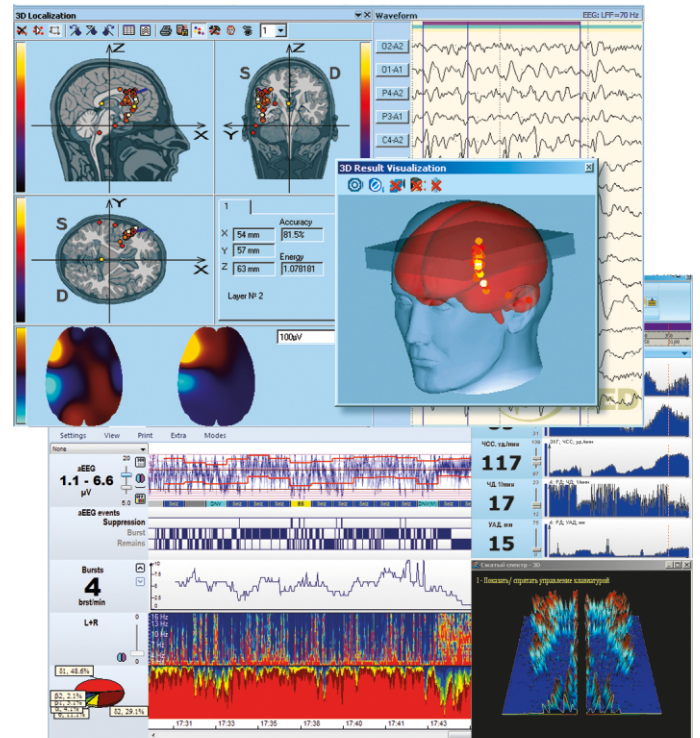
- **"Encephalan-CA"** Software for analysis of signals from polygraphical channels in combination with EEG signals provides calculation and visualization of trends, which display cardio-cyclic dynamics (averaging from cycle to cycle) of different physiological parameters of cardio-vascular, autonomic and central nervous systems, which provides visual evaluation of their interconnection.



- **"Encephalan-PSG"** software for somnological studies is designed for sleep stages analysis, for automatic hypnogram building, search for sleep events and forming reports on sleep statistics, sleep stages distribution and respiratory disorders, etc. the application analyzes EEG, EOG, EMG and other physiological signals recorded by polygraphic channels.

- **"HRV"** software for heart rate variability analysis for evaluation of ANS and neurohumoral regulation of a patient in initial (background) state and considering autonomic response to provoking actions. Provides the evaluation of adequacy of physical and psycho-emotional stresses, and drugs effect and treatment efficiency control.

- **"Encephalan-3D"** software for 3D localization of the electrical activity sources provides display of nominal source of electric activity on three projections of brain cut in the form of spatial dipole cloud, which allows localizing focus of EEG epileptiform activity or EP components source.



- **"Encephalan-CFM"** software for cerebral functions monitoring in ICU and reanimation provides continuous dynamic analysis of amplitude-integrated EEG (aEEG) to detect perinatal asphyxia and epileptiform activity in neonatology, and for neurophysiological control in ischemic strokes and unconscious post-comatose states.

- **"Encephalan-NM"** software for neuromonitoring in ICU and reanimation is designed to calculate and visualize trends (time quantum duration from 10 to 300 sec) of different physiological parameters of CNS, ANS and cardiorespiratory system in one time scale. Software gives information in digital and graphic forms to evaluate the state of a patient.

- **Software for the study of evoked potentials "Encephalan-EP"**, such as long-latency visual and auditory EP, somatosensory and visual EP for reversed pattern, as well as cognitive EP (MMN, CNV, P300).

- **"Encephalan-AVS"** software suite for EEG and EP studies using audiovisual stimulation uses different scenarios of cognitive stimulation. Subsensory (unconscious) stimuli presentation with masking and response control are available.

## Contact information

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