

MEDICAL EQUIPMENT

FOR FUNCTIONAL DIAGNOSTICS,
NEUROPHYSIOLOGY, SOMNOLOGY,
PSYCHOPHYSIOLOGICAL TESTING,
AND REHABILITATION

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years

CATALOGUE 2022

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Research & Development Limited Company



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To get correct specification for the equipment and
additional ads, address the manufacturer or its
authorized representative.

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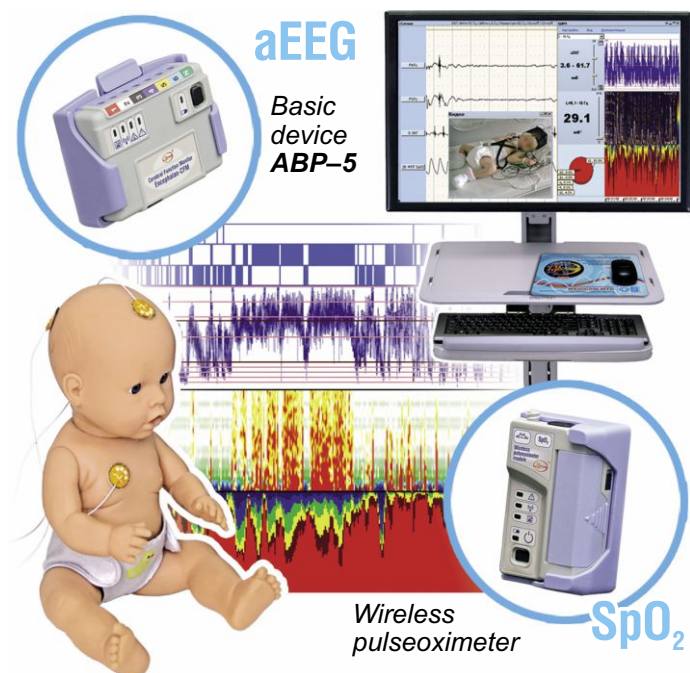
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Cerebral function monitor "Encephalan-CFM"

1a

Cerebral function monitor "Encephalan-CFM" is an indispensable tool for continuous dynamic analysis of electrical brain activity effectively complements the monitoring of vital parameters

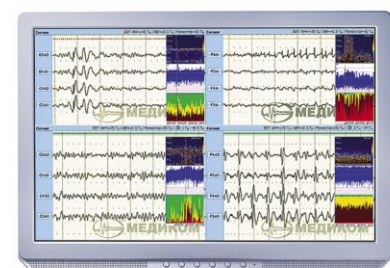


Dynamics of changes in the newborn brain activity, which cannot be traced during short-term EEG study, is clearly represented during continuous EEG monitoring in the form of amplitude-integrated EEG trends (aEEG), compressed spectrum and other quantitative parameters of the central nervous system along with the native EEG signal in low number of channels (3 to 5).

- Number of EEG channels – 5;
- Noise level – less than 1 μ V;
- ADC – 24 bit;
- Wireless data transmission – Bluetooth®;
- Memory card – microSD®;
- Power – 1 accumulator AA; or mains /USB adapter;
- Weight – up to 110 g.

Additional record for neuromonitoring:

- Oxygen saturation (SpO₂);
- Temperature; ■ ECG;
- Breathing parameters, etc.



- Option of simultaneous data monitoring of up to 4 patients with representation of results at a doctor's workplace.

■ **Optionally:** continuous digital synchronized EEG-videomonitoring (see item 7a)

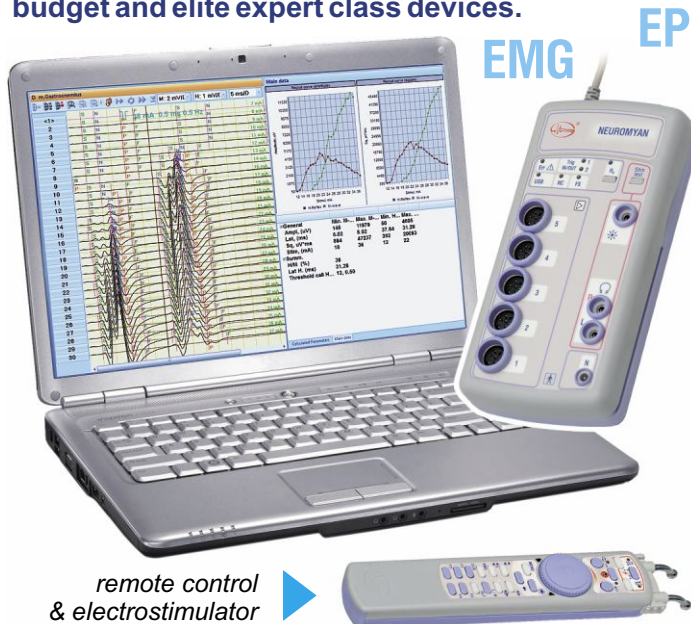


Bluetooth®

Neuromy analyzer NMA-4-01 "Neuromyan"

1b

2, 4 or 5-channel modifications and various versions of the software for quality record of myographic signals and evoked potentials provide selection of both not expensive on-budget and elite expert class devices.

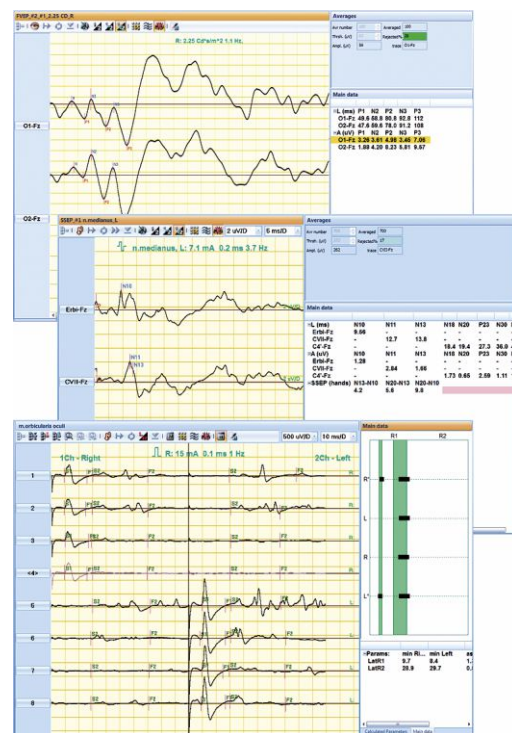


Techniques of electromyographic studies

- F-wave and H-reflex; ■ Motor unit potential;
- Blink reflex;
- Motor and sensory nerve velocity;
- Surface EMG express;
- Needle EMG;
- Surface multichannel EMG.

Evoked potentials study techniques

- Brainstem auditory evoked potentials;
- Middle and long latency auditory EP;
- Flash visual and pattern reversal EP;
- Short and long latency somatosensory EP.



Provides wireless communication of the patient transceiver-recorder with a remote control (RC), pattern-stimulator and footswitch.

The original remote control is an equivalent of a functional keyboard – it simplifies the carrying out of multiple standard tests without the use of a computer keyboard and mouse.

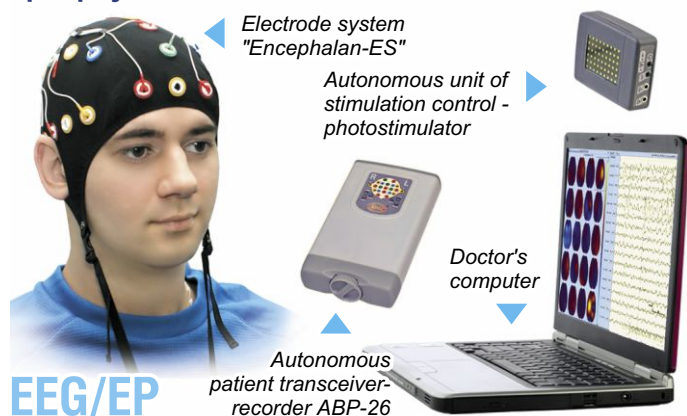
Managing a neuromyograph with a remote control is as easy as managing a TV-set remote control.

Portable electroencephalograph for mobile application

2a

Electroencephalograph-recorder
"Encephalan-EEGR-19/26", main modification

EEG-recorder is used for short-term and continuous EEG studies – in a hospital room or at the patient's home, including EEG-video monitoring for the differential diagnosis of epilepsy



26-channel basic patient transceiver-recorder ABP-26

- 20 channels for EEG and slow cortical potential;
- 2 EOG; ■ 1 respiration effort channel;
- 1 body position channel; ■ 1 ECG; ■ 1 EMG.

Additional wireless devices, modules and sensors (see items 18, 19)

- 1 SpO₂; ■ 4, 10 or more polygraphic channels;
- 4 channels of respiratory parameters;
- 3 ECG and 1 rheopneumogram.

■ **Portable electroencephalograph-recorder with SW EEG-studies "Encephalan-EEGR"** (see items 7b, 8a) allows safely and efficiently carrying out both short-term and long-term studies with topographic mapping and the use of modern methods of quantitative EEG data processing such as spectral, auto and cross-correlation analysis, the coherence function, mapping, identification of artifacts and seizure activity.

■ Automatic forming of EEG description and classification. Editor of conclusions, electronic cardfile and print manager help to save and perform the results of studies.



■ **Electroencephalograph-recorder with video kit and SW "Encephalan-Video"** (see item 7a) provides a fully synchronized prolonged recording of EEG and video on the state of the patient, which is the "gold standard" in the differential diagnosis of epilepsy.

Device for EEG monitoring in ICU and reanimation

2b

Electroencephalograph-recorder
"Encephalan-EEGR-19/26", main modification

The best tool for continuous multichannel monitoring of electrical brain activity (EEG) in the emergency room and intensive care units with the help of software for neuromonitoring "Encephalan-NM" and software for cerebral functions monitoring "Encephalan-CFM"

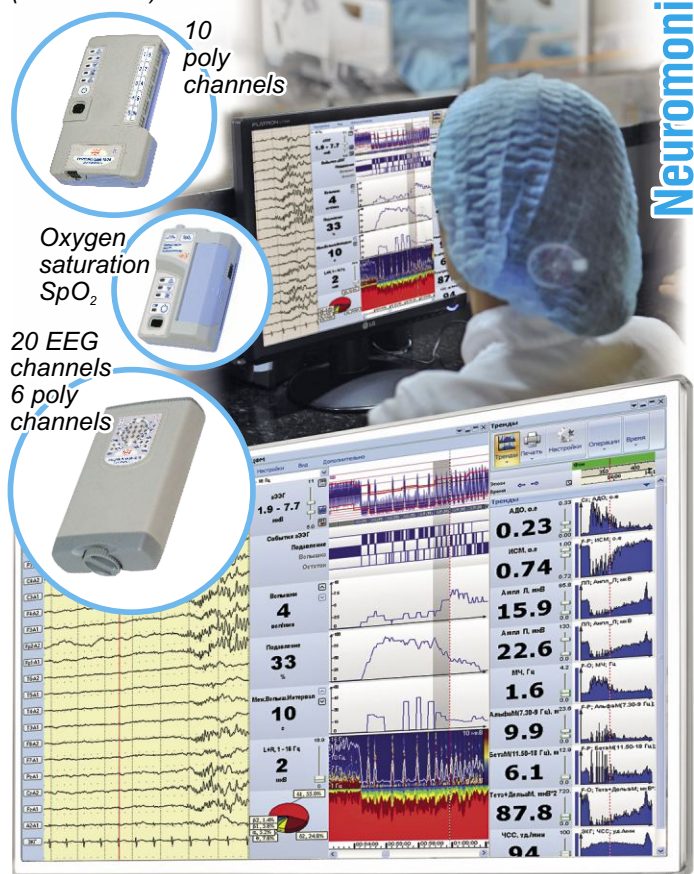
■ Provides high noise immunity from the effects of different equipment in ER and ICU – pulmoflators, defibrillators, coalescers, etc.

■ Convenience of the required CPR and patient care is ensured by wireless data transmission to a monitor located at a distance of 6 meters.

■ Synchronously recorded physiological signals are represented in the form of trends of calculated parameters, which reflect the status of the CNS, ANS and the cardiorespiratory system in the neuromonitoring window, and CSA trends, aEEG and indices of spectral rhythm power – in the window for cerebral functions monitoring.

■ The analysis uses diagnostically important indicators such as average and median frequency, spectral edge frequency, the effective EEG frequency band, as well as the processing results of such parameters as ECG, EMG, PG, PPG, SpO₂ in compressed form.

■ Supplementation of electroencephalograph-recorder with the video equipment kit for video monitoring synchronized with the data registered and SW "Encephalan-Video" provide refining of clinical picture during neuromonitoring (see item 7a).



Neuromonitoring

Autonomous EEG-recorder (Holter EEG)

3a

Electroencephalograph-recorder
"Encephalan-EEGR-19/26", main modification

Continuous record of electroencephalogram (over 48 hours) onto the memory card integrated into the patient transceivers-recorders ABP-26 or ABP-10 and a special set of electrodes "Encephalan-ES" (see item 15) provide comfortable carrying out of autonomous EEG studies (Holter EEG) in natural patient environment, both in a hospital ward or at home, during active wakefulness and sleep.

Continuous autonomic EEG-study is effective for:

- evaluation of undefined genesis disorders of not defined genesis, which are manifested under conditions of natural environment and behaviour;
- detection of pathological manifestations, such as paroxysmal epileptic states, transient ischemic attacks and others;
- differential diagnosis of epilepsy, types of seizure and syndromes, especially in irregular and illdefined paroxysm.



Holter EEG

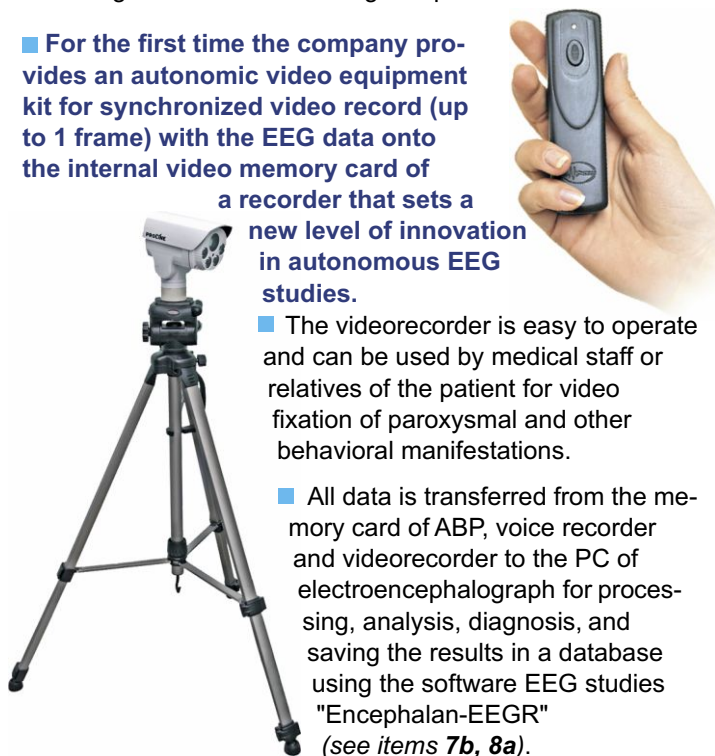
During autonomous study the device provides a unique opportunity for periodic functional tests in the telemetric mode required to induce controlled pathological manifestations.

■ During the research the patient can use a specialized digital voice recorder – event marker for synchronous with the EEG recording of comments on changes in patient's state.

■ For the first time the company provides an autonomic video equipment kit for synchronized video record (up to 1 frame) with the EEG data onto the internal video memory card of a recorder that sets a new level of innovation in autonomous EEG studies.

■ The videorecorder is easy to operate and can be used by medical staff or relatives of the patient for video fixation of paroxysmal and other behavioral manifestations.

■ All data is transferred from the memory card of ABP, voice recorder and videorecorder to the PC of electroencephalograph for processing, analysis, diagnosis, and saving the results in a database using the software EEG studies "Encephalan-EEGR" (see items 7b, 8a).



Electroencephalograph-transformer with multichannel mapping

3b

Electroencephalograph-recorder
"Encephalan-EEGR-19/26", main modification

EEG-recorder using EEG-20 connector for electrodes (cup or bridge) with touchproof connectors (20 or 32 derivations) and a special stand is transformed into an electroencephalograph for classical stationary applications in the room of neurophysiology and functional diagnostics.



20 EEG

32 EEG

Electrode sets for EEG studies



Cup EEG electrodes



Cup adhesive EEG electrodes



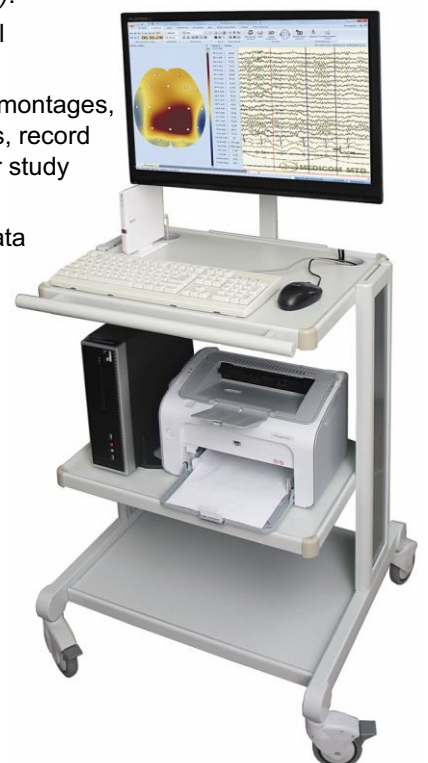
Bridge snap electrodes

Main features of the SW EEG studies "Encephalan-EEGR" ("elite" suite, see item 8a):

- Registration and visual analysis of EEG.
- Creating and using of montages, EEG derivation schemes, record scenarios and guides for study conditions.
- Processing of study data with various quantitative methods of EEG analysis, presentation of study results, printing and saving to the database.

Optional software
(see items 8b-9):

- "Encephalan-FBA";
- "Encephalan-3D";
- "Encephalan-EP";
- "Encephalan-VLFA";
- "Encephalan-AVS";
- "Encephalan-CA".



Multifunctional diagnostic system

4a

Electroencephalograph-recorder
"Encephalan-EEGR-19/26", main modification

Basic and additional software (see items 7b - 9), a large set of additional wireless devices, modules and sensors (see items 18-19), composing a set with the electroencephalograph-recorder, provide a wide range of clinical and neurophysiological and psychophysiological studies

Suggested list of recorded parameters:

- Electroencephalogram (up to 32 derivations);
- Slow cortical potential in EEG derivations (20 derivations);
- Electrocardiogram (up to 3 derivations);
- Electromyogram;
- Envelope EMG (EMG-E);
- Electrooculogram;
- Respiratory effort (abdominal and thoracic);
- Breathing airflow (nasal, oro-nasal);
- Patient body position;
- Movement activity;
- Oxygen saturation (SpO_2);
- Skin potential (electrodermal activity);
- Galvanic skin response;
- Photoplethysmogram;
- Rheogram (CHD);
- Rheopneumogram;
- Rheoencephalogram;
- Temperature;
- Snore;
- Tremor;
- Wetness;
- Illumination.



During studies, the following wireless devices can be used (see item 18):

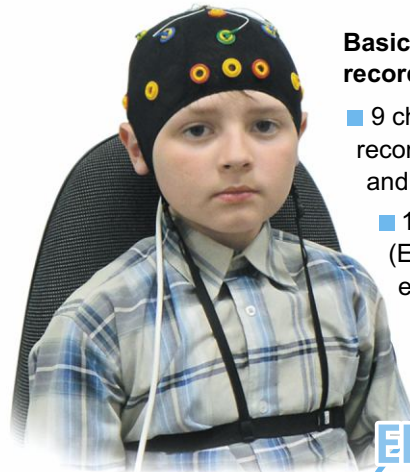
- Patient transceiver-recorder ABP-26 (1) with electrode system "Encephalan-ES" (2);
- Poly-4 module;
- Cardiorespiratory module PG-ECG (3);
- Pulse oximeter module (4);
- Respiratory sensors module (RSM);
- ABP-10 module (up to 2 pcs. in "Poly-10" mode);
- Wireless Movement Sensors.

Electroencephalograph-recorder "Encephalan-EEGR-19/26"

4b

Electroencephalograph-recorder
"Encephalan-EEGR-19/26", modification "Mini"

Electroencephalograph in a telemetric or off-line (Holter EEG) mode allows carrying out short-term and long-term EEG studies mainly in children and infants for differential diagnosis of epilepsy



Basic patient transceiver-recorder ABP-10

- 9 channels for EEG/EP record (including A1-A2) and slow cortical potential
- 1 polygraphic channel (ECG, EMG, respiratory effort, etc.)
- 1 body position channel



Electrode system
"Encephalan-ES" for comfortable EEG registration

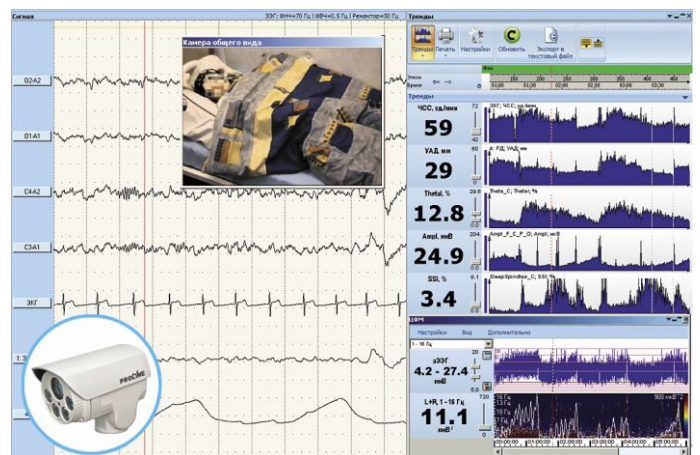
Optionally:

- 4, 10 or more polygraphic channels, 1 SpO_2 ;
- 3 ECG and 1 rheopneumogram;
- 4 channels of respiratory parameters.

■ Kit for video monitoring and the software "Encephalan-Video" (see item 7a) provide a fully synchronized prolonged recording of EEG and video on the state of the patient, which is the "gold standard" in the differential diagnosis of epilepsy.

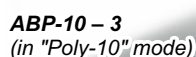
■ Continuous EEG record onto a memory card (over 48h) during offline EEG-studies (Holter EEG)

Electroencephalograph can also be used for continuous EEG monitoring in the emergency room and intensive care units with the help of software for neuromonitoring "Encephalan-NM" (see item 9) and software for cerebral functions monitoring "Encephalan-CFM" (see item 9), including the pronouncement of brain death.



5a

There is a unique opportunity of combination of two or three patient units ABP-10 with additional modules and sensors (*see items 18-19*), which allows you to create multifunctional polygraphic systems with synchronous recording of more than 30 different signals



Multichannel recording of EMG and motility in performing the task of keeping vertical posture

The GPS-tracker provides synchronous registration of spatial parameters (see item 18)

The **GPS-tracker** provides synchronous registration of spatial parameters
(see item 18)

Multiparameter record and control over the ongoing processes contribute to effective application of **polygraphic system in functional biocontrol with biofeedback** (see items 12b-13).

5b

The modular concept of a unified hardware and software for a portable equipment produced by Medicom MTD allows you to create different versions of equipment sets for complex applications in sport and scientific research



■ Electroencephalographs-
recorders "Encephalan-EEGR"
main and "Mini" modifications (see items **2a**, **3a**);

- Psychophysiological telemetric system "Rheacor-T" (see *item 12b*):

■ System for objective psychological analysis and testing "Egoscop" (see item 16).

- Neuromyoanalyzer "Neuromyan" (see *item 1b*);

- The device for psychophysiological testing "Psychophysilog" with a module for psychomotor tests – MPT (see *item 17a-b*);



Computerized complexes for electroencephalography and evoked potentials

6a

Electroencephalograph-analyzer
EEGA-21/26 "Encephalan-131-03"

Effective and reliable tool for classic electroencephalography

EEG/EP



- **Modification 09:**
21 channels for EEG/EP/VLFA,
1 polygraphic channel (ECG)
- **Modification 11:**
21 channels for EEG/EP/VLFA,
4 polygraphic channels (ECG)

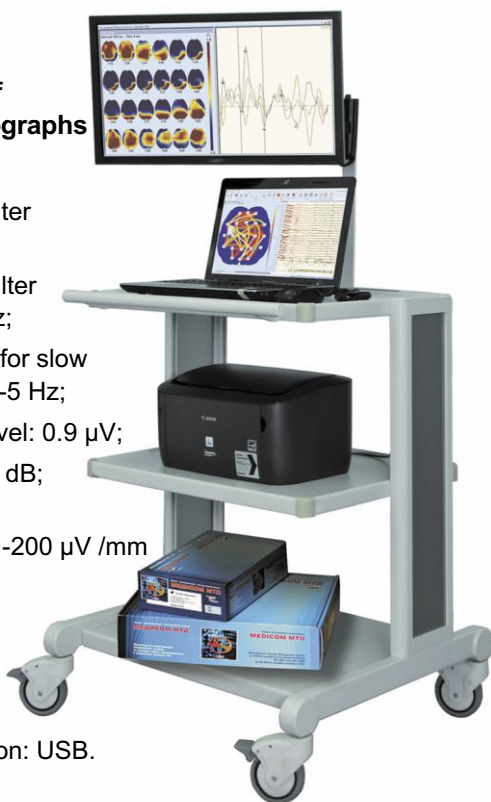
■ Presentation of up to 64 digital EEG derivations for visual analysis

■ Photo- and phonostimulator

■ **Suits of the software EEG studies "Encephalan-EEGA":**
"basic", "optimal", "professional", "elite"
(see item 8a)

Main technical characteristics of electroencephalographs

- ADC: 22 bit;
- Low-frequency filter (LFF): 5-70 Hz;
- High-frequency filter (HFF): 0.016-16 Hz;
- Frequency band for slow cortical potential: 0-5 Hz;
- Ultralow noise level: 0.9 μ V;
- CMRR: over 125 dB;
- Sensitivity:
for EEG/EP – 0.1-200 μ V /mm (21 stages),
for slow cortical potential –
0.02-5 μ V /mm (8 stages);
- PC communication: USB.



Computerized complexes for electroencephalography, REG and evoked potentials

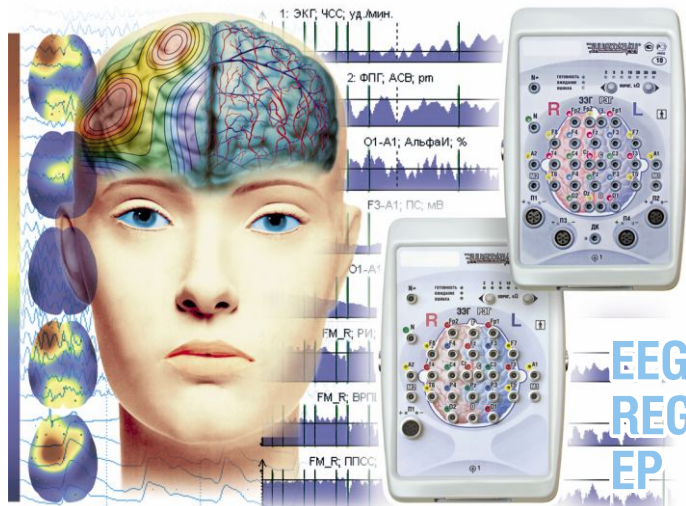
6b

Electroencephalograph-analyzer
EEGA-21/26 "Encephalan-131-03"

Violations of the electrical brain activity and cerebral circulation and their relationship are reliably detected by the unique option to conduct simultaneous EEG and REG studies

- **Modification 08:**
19 channels for EEG;
6 channels for REG;
1 polygraphic channel (ECG).

- **Modification 10:**
21 channels for EEG;
6 channels for REG;
4 polygraphic channels (ECG);
1 additional channel.



Additional technical characteristics of electroencephalographs (sensitivity)

- For volume REG: 5-500 megohm /mm (7 stages);
- For differential REG: 0.1-10 ohm /mm (7 stages);
- For polygraphic channels (modifications 10, 11):
0.1-200 μ V/mm (13 stages).

The innovative technique of compressed cycle-by-cycle representation of the parameter dynamics during synchronous record of EEG, REG, ECG (modification 08) and other signals by the polygraphic channels (modification 10) in the same time scale, illustrates the relationship between the various systems of the body and allows you to:

- differentiate the causes of pathological changes at provoking effects (functional tests);
- take into account the possible influence of vascular factor in epilepsy;
- effectively diagnose cerebrovascular disorders during functional tests for hyperventilation;
- diagnose syncopal states.

Simultaneous studies of EEG and cerebral circulation saves time of medical staff.

Recommended optional software and functionality (see items 8b-9)

- **"Encephalan-EP"** – study of long-latent evoked potentials, MMN, cognitive (CNV, P300), and somatosensory EP at chess pattern.
- **"Encephalan-Video"** – EEG-video monitoring for the differential diagnosis of epilepsy.
- **"Encephalan-VLFA"** – analysis of slow cortical potential (very low frequency activity).

- **"Encephalan-CA"** – analysis of signal via polygraphic channels together with EEG.
- **"Encephalan-FBA"** – analysis of functional brain asymmetry.
- **"Encephalan-3D"** – three-dimensional localization of brain abnormal electrical activity.
- **"HRV"** – heart rate variability analysis.

Videomonitoring kit and software "Encephalan-Video"

7a

for electroencephalographs and polysomnographs "Encephalan", monitor "Encephalan-CFM" and system "Rehacor-T".

Kits of video equipment and software "Encephalan-Video" provide quality synchronous record of video information, EEG and other physiological parameters registered with the diagnostic equipment manufactured by Medicom MTD during:

- continuous EEG monitoring in epilepsy and neurological departments for differential diagnosis of epilepsy;
- neuromonitoring and cerebral functions monitoring in the intensive care units and emergency room;
- polysomnographic and scientific studies.

Mobile variants – "basic", "basic advanced" and "autonomous"

Allow conducting necessary studies, in a study of functional diagnostics, a hospital ward, ICU and ER, both in the field and at patient's home.



High-quality network (Ethernet, WiFi) cameras (day/night), including writing onto the memory card, are used for audio and video record synchronized with EEG data.

Stationary variants – "professional" and "professional advanced"

Provide carrying out of EEG/PSG video monitoring (day/ night) with a patient being in a 30 m² ward and recording audio from two microphones (in the patient's ward and staff's room).



Additionally to any kit:

- Option to increase the number of video cameras in a sales package up to 4 pcs.
- Wireless event marker.

Main software EEG-studies

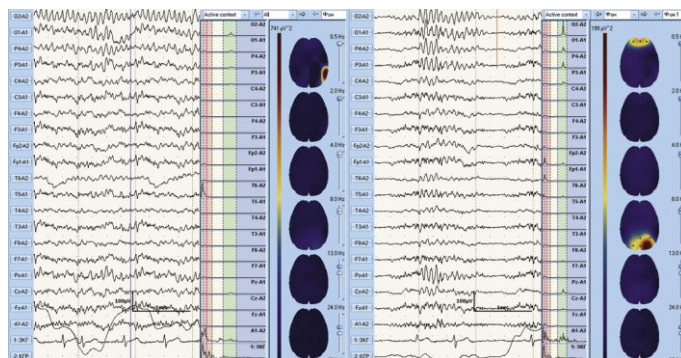
7b

for electroencephalographs "Encephalan" and monitor "Encephalan-CFM"

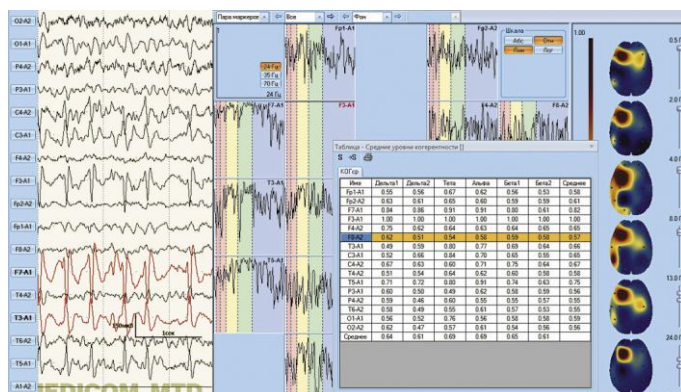
Main software for EEG studies has the following modifications – software "Encephalan-EEGA", "Encephalan-EEGR" and "Encephalan-CFM", which consider peculiarities of the implementation and application of various devices manufactured by Medicom MTD using user-friendly and advanced interface Ribbon running the Windows operating system of different versions (XP/7/8).

Common features of all software modifications of EEG-studies

- Record and mapping of EEG with high-resolution, continuous monitoring of electrode impedances and electrode potentials, automatic or manual setting of markers on EEG, the search and recognition of non-stationary or epiactivity.
- Control of sensitivity, sweep speed and bandwidth of the EEG (HFF/LFF), carrying out functional tests by the patterns, the "microscope" mode to view signals in split mode, the remontage, EEG montage library, scenario editors and conditions of the study.



- Quantitative methods of analysis: spectral, auto and cross-correlation analysis, the coherence function and the spectral and amplitude 2D and 3D mapping. Automatic suppression of artifacts in EOG, ECG, EMG.



Peculiarities of software EEG studies

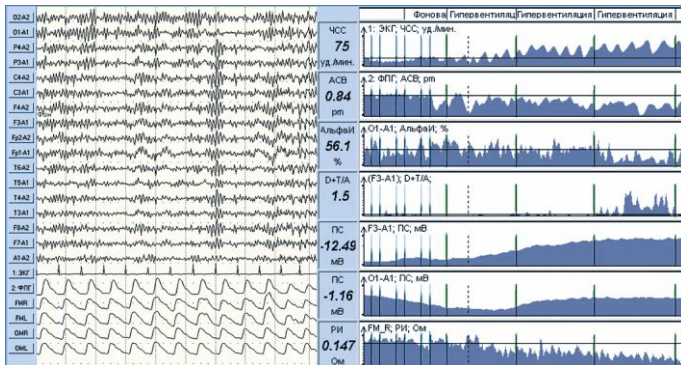
8a

"Encephalan-EEGA", "Encephalan-EEGR" and "Encephalan-CFM"

The software "Encephalan-EEGA"

Uses common features of the software EEG-studies to work with **electroencephalographs-analyzers** "Encephalan-131-03" of all modifications (see items 6a, 6b). The variants - "basic", "optimal", "professional" and "elite" – differ in functionalities, which are grouped for different levels of use. The software includes corresponding sets of montages and study conditions.

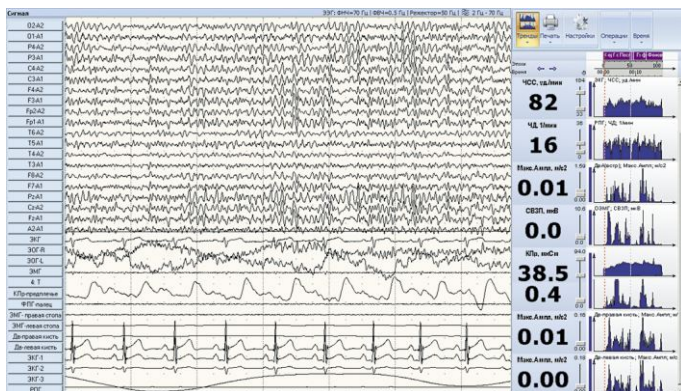
The software main feature is the synchronous record of EEG and REG studies.



The software "Encephalan-EEGR"

Ensures the implementation of telemetric and autonomous EEG studies while working with **electroencephalograph-recorders** "Encephalan-EEGR-19/26" of the main modification (see items 2a - 4a) and modification "Mini" (see items 4b - 5b). The software includes corresponding sets of montages and study conditions, which consider various optional wireless modules and sensors from the sales package of an electroencephalograph (see items 18-19).

The software main feature is to provide a multichannel and multifunctional studies in a stationary, portable and offline versions.



The software "Encephalan-CFM"

Provides continuous dynamic EEG analysis for detection of epileptiform activity, for neurological prognosis at perinatal asphyxia in neonatology, for post-comatose unconscious states in ICU and ER, for neurophysiologic control in ischaemic strokes.

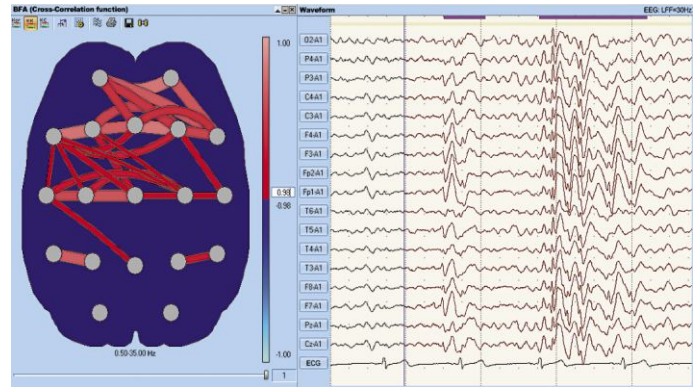
The software feature is to form trends of amplitude-integrated EEG (aEEG), color scales of DSA and spectral parameters of the EEG trends in order to identify and classify specific patterns.

Optional software and functionality

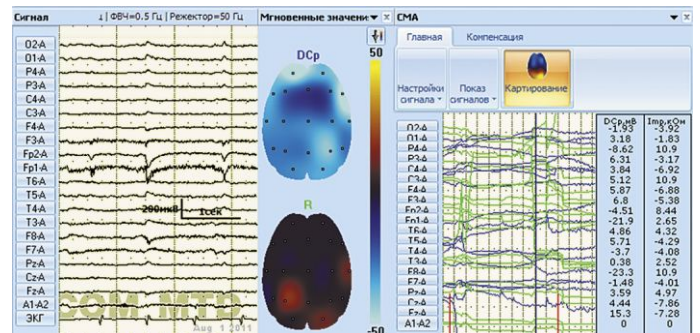
8b

for electroencephalographs "Encephalan", monitor "Encephalan-CFM" and system "Rehacor-T".

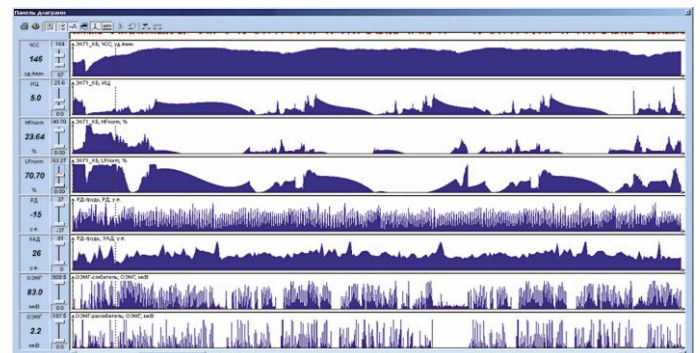
■ **Analysis of functional brain asymmetry "Encephalan-FBA"** provides visualization of intercentral connections maps by calculating the reciprocal functions (cross-correlation, cross-spectrum, the coherence function), for the diagnosis of inter-and intracortical violations, detection of focus of pathological activity, as well as for treatment monitoring.



■ **Analysis of very low frequency activity simultaneously with the registration of EEG "Encephalan-VLFA"**. Trends of changes of constant potentials levels, topographic maps of the instantaneous values and reactive changes in the slow cortical potential to performed functional tests indirectly allow evaluating cerebral energy transfer and dynamics of metabolic changes.



■ **Signal analysis by polygraphic channels combined with EEG signals "Encephalan-CA"** provides the calculation and visualization of trends reflecting cycle-by-cycle dynamics of different physiological parameters of the cardiovascular system, ANS and CNS, which allows visual evaluation of their relationship.



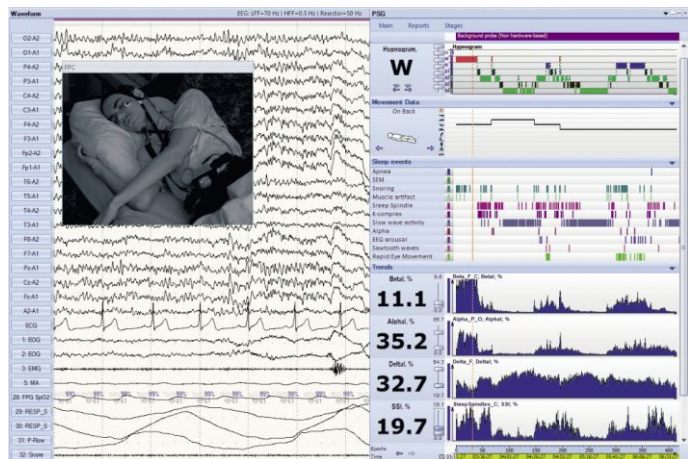
■ **Software Audio-visual stimulation "Encephalan-AVS"** for EEG and EP studies implements different scenarios of cognitive stimulation with the option of subsensory (unconscious) stimulus presentation.

Optional software and functionality

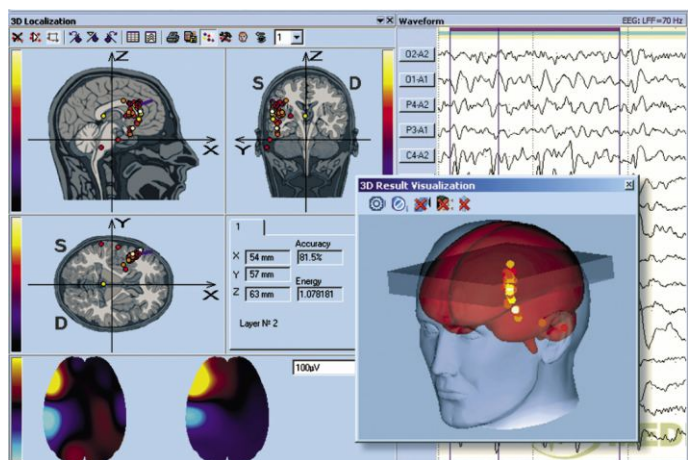
for electroencephalographs "Encephalan", monitor "Encephalan-CFM" and system "Rehacor-T".

9

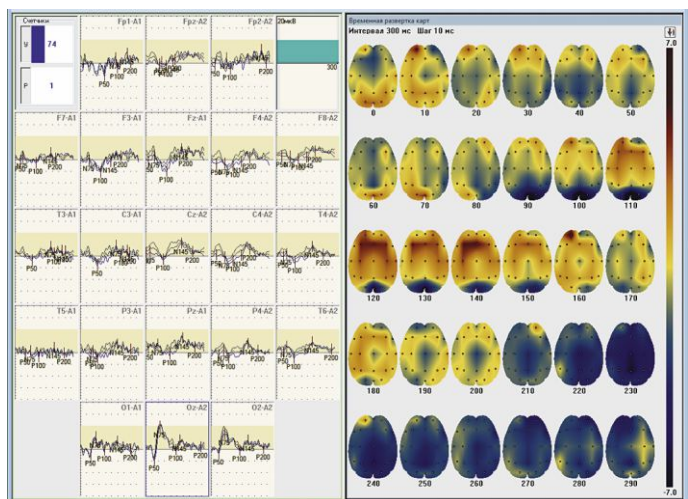
■ **Somnological studies "Encephalan-PSG"** are designed for the analysis of sleep phases, automatically built hypnograms, as well as for search for sleep events and reports generation (sleep statistics, distribution of sleep stages, respiratory disorders, etc.).



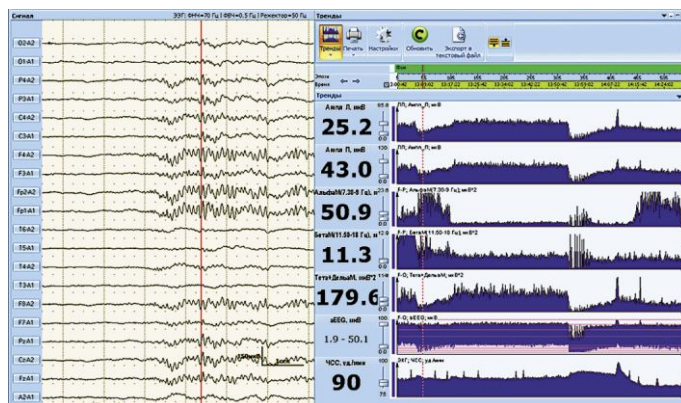
■ **Three-dimensional localization of electrical activity sources "Encephalan-3D"** displays a conditional source of electrical activity in the three planes of a brain cut in the form of a spatial cloud of dipoles, which allows us to localize the focus of epileptiform EEG activity or source EP components.



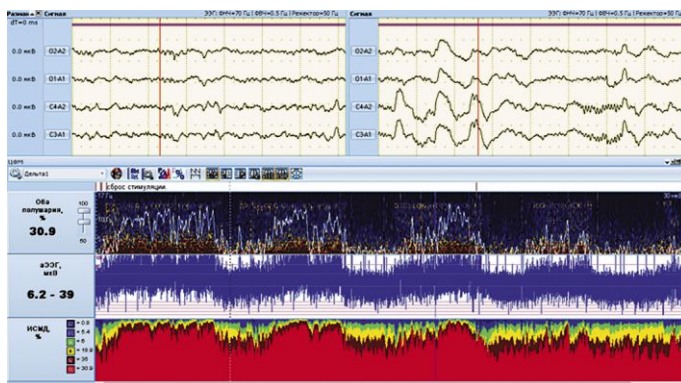
■ **EP-studies "Encephalan-EP"** are the study of visual and auditory long-latency EP, somatosensory and visual EPs to chess pattern, as well as cognitive EP (MMN, CNV, P300).



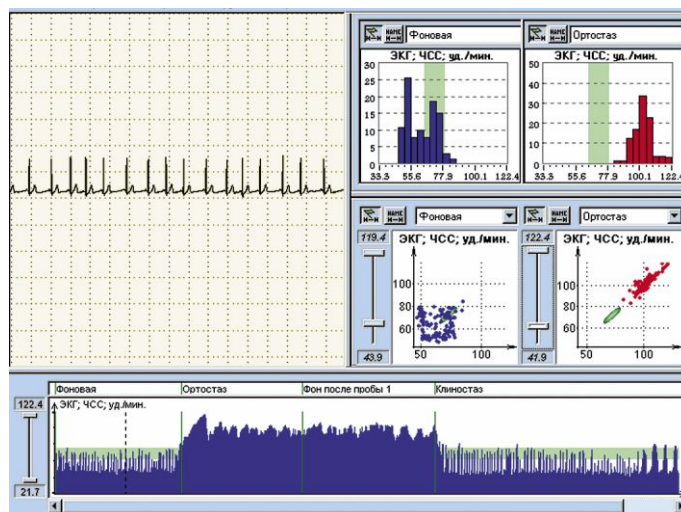
■ **"Encephalan-NM" for neuromonitoring in the ICU and ER** is designed to calculate and visualize trends (the duration of time position from 10 to 300 s) of different physiological parameters of the CNS, ANS and the cardiorespiratory system in the same time scale for the assessment of the patient's state.



■ **Cerebral functions monitoring in ICU and ER "Encephalan-CFM"** provides continuous dynamic analysis of amplitude-integrated EEG (aEEG) for detection of epileptiform activity and at perinatal asphyxia in neonatology, for post-comatose unconscious states in ICU, for neurophysiologic control in ischaemic strokes.



■ **Heart rate variability analysis "HRV"** provides evaluation of the state of ANS and neurohumoral regulation considering autonomic reactivity to events during a continuous study or to provocative actions. Evaluates adequacy of physical and psycho-emotional stresses.



Sleep signals recorder "ApnOx-04"

for respiratory
screening – 3 channels

Type IV
AASM

10a

Sleep signals recorder "ApnOx-10"

for cardiorespiratory monitoring –
7 and more channels

Type III
AASM

10a

Sleep screening at home becomes easier, more accessible and more accurate!

Signals and parameters:

- oxygen saturation (SpO₂);
- photoplethysmogram, pulse rate, perfusion index, respiratory rate and conventional respiratory amplitude (based on SpO₂);
- pressure airflow;
- snore and airflow velocity (based on the airflow data);
- body position and total movement activity (integrated accelerometer sensor);
- CPAP Pressure.

Recording modes:

- autonomous – data record onto the memory card;
- telemetric – data transmission into computer via wireless Bluetooth® channel.



Additional
wireless
module
Poly-4



Signals and parameters:

- thoracic and abdominal respiratory effort;
- electrocardiogram;
- heart rate (based on ECG);
- pulse wave transit time (based on ECG and PPG);
- snore (accelerometer sensor);
- airflow (thermistor airflow sensor);
- motility;
- skin conductance;
- signals from DC-inputs.

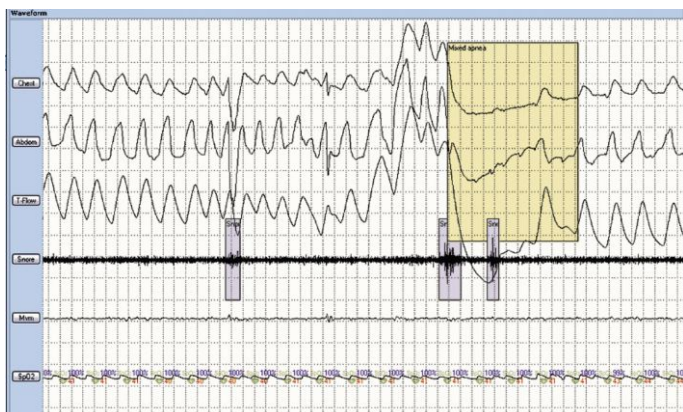
Each of polysomnographs can be supplemented with kits of equipment for synchronized video monitoring.

"Encephalan-PSG" software

Software suits of "Encephalan-PSG" – "basic", "neurological" and "maximum" – in combination with polysomnography equipment manufactured by Medicom MTD provide wide range of functional capabilities taking into account recommendations of the AASM and the CSM.

Main functional capabilities of "basic" suite for apnea screening and cardiorespiratory disorders analysis:

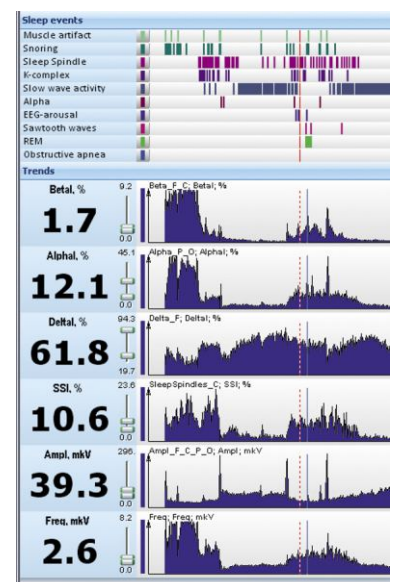
- Automatic search and differential diagnostics of central, obstructive and complex sleep apnea on the basis of data from thoracic and abdominal respiratory effort, respiratory airflow and SpO₂ sensors;
- Analysis of cardiovascular system disorders associated with apnea events (1 or 3 ECG channels);



- Automatic search of oxygen desaturation events;
- Automatic search of snore events;
- Detection and analysis of patient body position;
- Presentation of sleep events in one time scale with trends of respiratory rate, nominal respiratory amplitude, nominal respiratory minute volume, SpO₂, heart rate, mean and maximal amplitude of snoring signal.
- Reports with calculated indices of snoring, desaturation and respiratory disorders according to body position, with data on the change of oxygen saturation and heart rate as well as report form with data on body-position in sleep.

Additionally:

- Manual or automatic hypnogram building (if montage contains at least 2 EEG and 2 EOG channels) using quick search of required fragments and trends of calculated parameters.
- Analysis of limbs movements for detection of restless legs syndrome (if montage contains 2 EMG derivations).



Rehabilitation psychophysiological system "Rehacor"

12a



Basic device – patient multifunction transceiver "Rehacor"

- 4 channels;
- interface channel to stabilplatform;
- electrostimulation channel;
- sensors and electrodes (see item 19).

Three models of "Rehacor" system:

■ **"Biofeedback" model** is meant for self-regulation skills and psychophysiological state training as well as for correction of different psychosomatic disorders using wide range of physiological parameters and their combination.

■ **"Egoscop" model** is meant for psychognostic and psychophysiological studies conducted on the basis of inventories, cognitive, projective and psychophysiological tests on interactive sensory display with control of physiological indices dynamics (software "Egoscope", see item 16).

■ **"Biofeedback-Egoscop" model – two in one.**

Psychophysiological telemetric system "Rehacor-T"

12b

"Rehacor" Software for Functional Biocontrol with Biofeedback Training



Basic wireless device – autonomous patient transceiver-recorder ABP-4

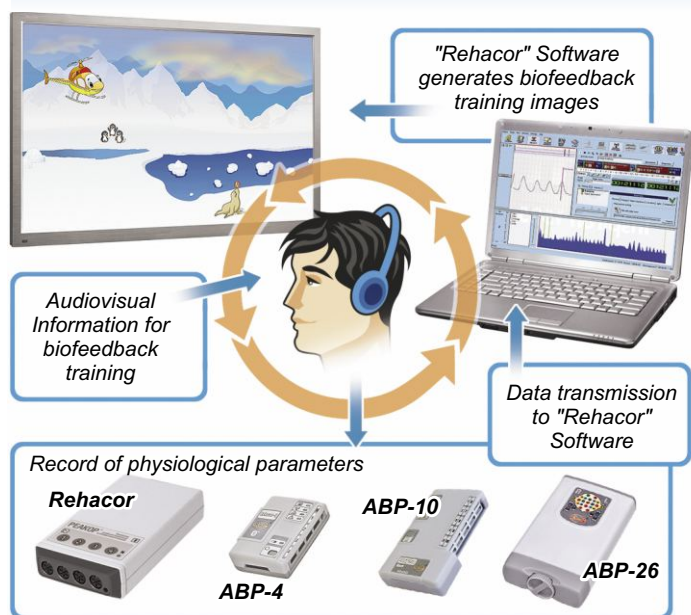
- 4 channels in basic device – ABP-4;
- 4 channels in additional device – Module "Poly-4";
- sensors and electrodes (see item 19).

Following are the differences of psychophysiological telemetric system "Rehacor-T" from rehabilitation psychophysiological system "Rehacor":

- wireless connection to PC, self-contained power supply, multichannel record (more than 8 channels) that allow carrying out biofeedback procedures without restricting patient's activity that is particularly effective in sport, occupational medicine and educational technologies.
- using additional wireless devices (see item 18).

"Rehacor" Software for Functional Biocontrol with Biofeedback Training

www.reacor.ru



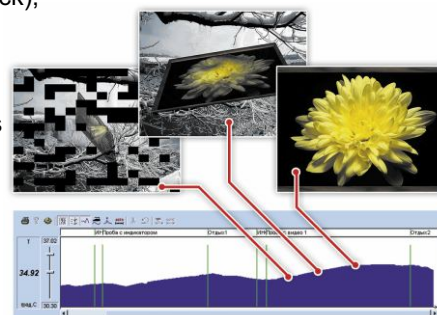
"Rehacor" Software for Functional Biocontrol with Biofeedback Training uses the "physiological mirror" principle for carrying out biofeedback and neurofeedback procedures and promotes learning skills of psychosomatic regulation for the purpose of rehabilitation and health, as well as improving psychophysiological capabilities. By means of this Software a patient has a literal opportunity to see and hear nuances of his state change.

Audiovisual forms diversity of biofeedback images makes each procedure original and stimulates the patient's motivation for actual state transformation.



- trends, scales, diagrams, images, slides, videos, animation and various game plots;
- information screensavers and instructions for procedures;
- linear, three-dimensional and noise-like distortions, morphing of images, connected with physiological signals changes (biofeedback);

- various audio fragments (music, voiced and other instructions, sounds of nature);
- amplitude, frequency and noise-like distortions, depending on the success of the procedures.



Controlled parameter change leads to biofeedback image transformation.

Biofeedback and neurofeedback equipment

13a

Electroencephalograph-recorder "Encephalan-EEGR-19/26", "Mini" modification with SW "Rehacor" for Biofeedback Training



Basic wireless device – autonomous patient transceiver-recorder ABP-10

- 10 channels in basic device – ABP-10 (up to 8 EEG derivations);
- additional wireless modules (see item 18);
- sensors and electrodes (see 19).

The main features of the wireless electroencephalograph, modification "Mini", are:

- multiparameter record (10 or more), which allows create and use more effective scenarios of biofeedback procedures in sport, education, science and for special training and rehabilitation;
- professional neurophysiological support using software for electroencephalographical studies (see items 7b-8a) and additional software (see items 8b-9).

Biofeedback and neurofeedback equipment

13b

Electroencephalograph-recorder "Encephalan-EEGR-19/26", main modification with SW "Rehacor" for Biofeedback Training



Basic wireless device – autonomous patient transceiver-recorder ABP-26

- 26 channels (20 EEG, 2 EOG, 2 EMG, 1 ECG, 1 Poly) in basic device – ABP-26;
- additional wireless modules (see item 18);
- sensors and electrodes (see item 19).

The main features of the electroencephalograph, main modification, are:

- 12 or 20 EEG derivations providing greater possibilities for biofeedback and neurofeedback procedures by EEG and superslow electrical brain activity using quantitative methods of analysis (qEEG, aEEG).
- professional neurophysiological support using software for electroencephalographical studies (see items 7b-8a) and additional software (see items 8b-9).

"Rehacor" Software for Functional Biocontrol with Biofeedback Training

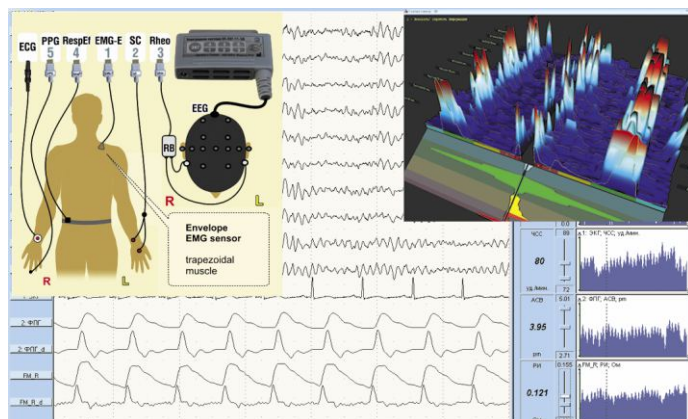
Biofeedback and neurofeedback procedures from the library use different parameters and their combinations depending on equipment suit: rhythm of EEG signals and their correlation, superslow electrical brain activity, heart parameters (heart rate, pulse transit time, systolic wave amplitude), blood circulation (central hemodynamics and cerebral circulation), autonomic nervous system (temperature, GSR), respiration, muscle activity (EMG and envelope EMG), etc.



- "Basic" software suit contains biofeedback procedures by various parameters.
- "Professional" software suit is supplemented with neurofeedback procedures with multichannel EEG record and multiparametric procedures.
- Additional procedures (see item 14).

Flexible and convenient scenario editor allows modifying library procedures or creating new ones considering esthetic, intellectual, age and other preferences.

Multiparameter monitoring during neurofeedback training (for electroencephalographs-recorders "Encephalan-EEGR-19/26") allows a specialist to evaluate efficiency of regulatory mechanisms involvement of various levels in a test person in case of goal achievement (for example, alpha-rhythm and zonal differences optimization).

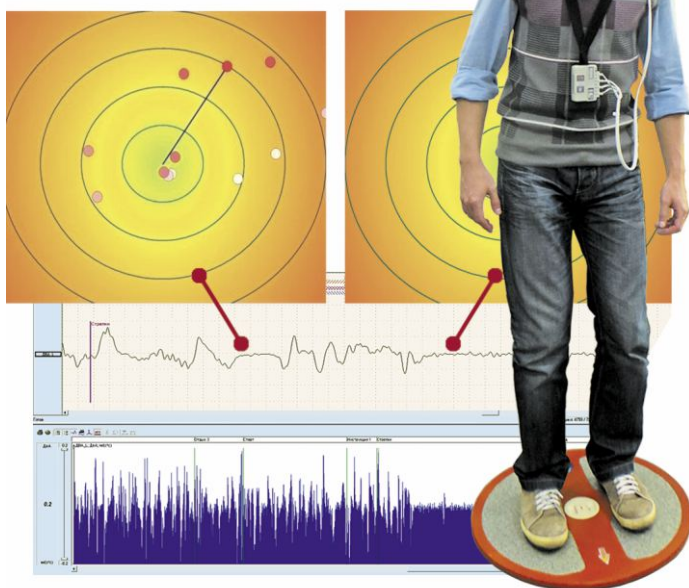


Stage-by-stage and course dynamics evaluation indicates the degree of success of a test person's effort to change physiological parameters in relation to different stages of biofeedback procedure and dynamics of the test person's state from procedure to procedure (integral efficiency).

■ Balance training while maintaining a vertical posture on a balance platform

is used to train the skill of steadiness and movement coordination in sport and fitness contributing to restoration of proprioceptive mechanisms in some neurological disorders.

Parameters of balance platform incline change can direct the cursor movement during the test "Schulte Table" or while operating images of an adaptive model of operator performance.



■ Simultaneous operator performance training with tracing and logic task solving

is designed for training aimed at increasing efficiency of the combined operator performance as well as at an objective assessment of the operator performance indicators and physiological activity cost.



It is used to evaluate the professional abilities of staff whose job is connected with exclusive standards for psychophysiological human reserves (monotonous work and necessity of maintaining attention concentration).

Combining the task of tracing with arithmetic logic task solving is used as an adaptive model of operator performance. Parameters of moving target (size and speed) change adaptively (become more complicated or simpler) depending on the tracing performance efficiency.

■ Biofeedback group training on synchronization of sports team actions

A variety of sensors (for example, respiration, temperature, GSR, etc.) can be used for training. They are attached to each of the team members. Biofeedback image displays personal characteristics, as well as integrated ones, and is estimated and presented by data from these sensors.

Group training allows the team members to enhance the interaction and mutual understanding, thereby increasing the degree of the team actions coherence and sport results.



■ Procedures "Rhythmo BFB"

Evaluation and training of the ability to perceive and reproduce sound patterns of varying complexity. Developing a sense of rhythm and time. Increasing the success of cognitive activity and rehabilitation of various brain dysfunctions.



■ Training of the stress resistance skills using somatosensory stimulator

is used to form the stress resistance skill in healthy people (sportsmen, security agencies employees, etc.). It's also used for therapy of neurotic patients with phobia and anxiety symptoms.



The skill is formed by means of training of excessive autonomic activation (galvanic-skin response change) in response to stress stimulus presentation (moderate pain stimulation) suppression.

EEG electrodes of this electrode set are specially fixed and positioned at the specific attachment slots on the fixing elastic net cap. Electrode and a corresponding fixing slot are of the same colour. Each electrode has a conductor of a specified length from the concentrator. Conductors are grouped by left and right hemispheres, by forehead and back of the head for comfortable distribution.

■ The set contains three types of electrode systems (adults, children, and babies) and corresponding fixing elastic caps of different sizes.

■ Color marking of electrodes and fixing slots on the cap, as well as easiness of electrode attachment to the slots, ensures fast and accurate positioning of the electrodes on the patient's head and simplifies preparation for EEG record.

■ Electrode system and electrode cap can be separated, which provides their effective cleaning and disinfection, and allows replacing the cap or the electrode system if necessary.

■ Fixing caps and cover caps are washed with delicate washing powder.

■ Thin and flexible cable ensures reliability and decreases the number of artifacts during EEG record. This allows using electrode systems effectively during long-term EEG record, especially without restricting activity.

■ Low level of EEG electrodes and fixing slots for their attachment, elastic material of the slots, and comfortable elastic net cover caps ensure comfort of a patient and high quality of EEG record.

■ Silver chloride electrodes are produced by powder technology and require no recovery of the AgCl layer. They are resistant to cleaning and damaging effect of EEG gels electrolytes, and also provide stable performance during their service life.



Adhesive cup electrodes are used in long-term EEG studies, such as somnology and epileptology, when quality EEG signal is the most important.

■ The set "Encephalan-ES" contains different types of electrode systems with adhesive cup electrodes.

■ Each electrode has a certain length wire from the end of the overall cable.

■ The wires of the electrodes are grouped into bundles for easy distribution to the left and right hemisphere, forehead and neck.

■ EEG electrodes are glued to the skin using high-conductive paste and fixed with an adhesive plaster and collodium (or similar medical-purpose glue).

■ The usage of 20 or 32 EEG electrodes with touchproof connectors during the research requires using of special adapter cable. Elastic strap provides a quick and easy mounting cable adapters to the patient's chest by an hook-and-loop fastener.

■ An attractive feature of the suggested approach is flexible, thin and durable conductors of EEG electrodes which are grouped into one comfortable flexible cable, which can be easily attached to the group connector.

■ After the attachment of the electrodes onto the patient's head they are additionally fixed by special protective cover-cap.



Objective psychological analysis and testing system “Egoscop”

www.egoscop.ru

It uses the original innovative technology, which includes autodocumentation of a testing process, hand motility analysis of a test person, additional synchronous recording of psychophysiological parameters (pictopolygraphy) and provides a new level of psychological and psychophysiological diagnostics



The test person answers to questions using the touch-screen tablet as in common tests of paper forms

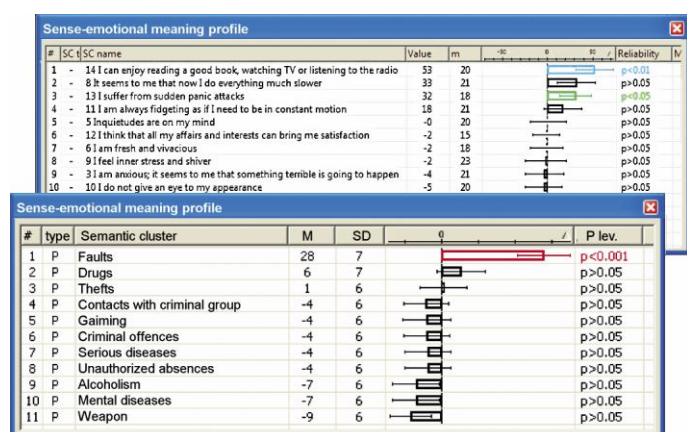


kit fits in a laptop bag

Fundamental differences from analogues:

■ **Paperless testing** is presentation of forms provided for testing and other stimulus material with a special touch-screen tablet, as well as fixing the answers of a test person and his/her emotional motor responses with the help of autodocumentation technology. Data is processed by the computer, and test results are presented in a common form.

■ **Analysis of psychophysiological and psychomotor parameters, synchronized with the testing process (pictopolygraphy technology)** provides evaluation of the intensity, direction and variability of test person's responses while implementing a study scenario and, in addition to the usual test results, generation of profiles of semantic-emotional significance (SES).



■ **An expandable library of tests** includes personal and cognitive, projective and psychophysiological tests, state tests, etc. adapted to the technologies of autodocumentation and pictopolygraphy.

■ **Test Editor** allows creating new and adapting common tests to the proposed technology.

■ **System transportability** is ensured by autonomous battery power supply, low weight and small size of the equipment.

Complexes may include touch-screen tablets with different screen sizes. 13-inch tablet provides a high mobility of a system. 16' or 17' tablets ensure comfort for a stationary testing.

■ The ability to use the color and line thickness when performing projective drawing tests allows the psychologist to take into account **color preferences of the test person** when interpreting the results of the different test stages.

Organization of testing in the network setting

■ Contemporary IT technologies make it possible to test groups of subjects in the network setting that improves the efficiency and throughput capability.

■ Network setting can be used for testing personnel in large organizations, for the study of practical testing methods in the departments of psychology and psychophysiology of higher education institutions, for group laboratory and practical training, and in scientific research.

■ All actions on selection and activation of test scenarios on workplace, on test performance control and data storage can be done by one person trained in dealing with the system.



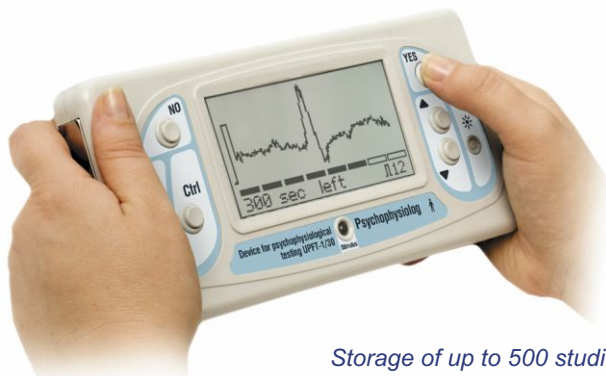
Network testing system consists of an instructors' and test persons' workplaces, connected to a local area network – wired Ethernet or wireless WiFi.

The known psychological and physiological tests are harmoniously complemented with new diagnostic information that allows taking into account voluntary and involuntary emotional reactions of a test person in relation to the standard scales and semantic clusters used in the standard tests

The device for psychophysiological testing UPFT-1/30-"Psychophysiollog"

17a

New opportunities for psychologists and psychophysiologicals, examining different aspects of person's professional activity

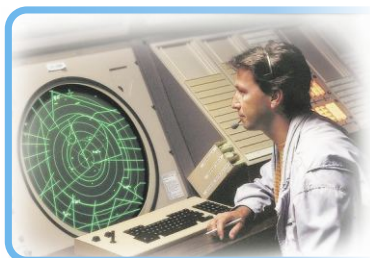


Storage of up to 500 studies

Typical testing scenarios for different age, social and professional groups optimize the work of the psychologist

■ Results are presented on the LCD display of UPFT "Psychophysiollog" for operational analysis immediately upon completion of testing.

Analysis of the change dynamics of the parameters of a test person for a long period of observation is carried out at a personal workplace of a psychologist.



■ Registration of the time spent on the response allows analyzing the unconscious or uncontrolled reactions of the subject, as well as the conscious simulation in the testing process.



■ UPFT "Psychophysiollog" is used for pre-shift, pretrip and pre-launch control in sports, in security services, Ministry of Emergency Situations, aviation, energy and transport, as well as in the selection and assessment of personnel.



The device UPFT "Psychophysiollog" without additional module of psychomotor tests may perform the following basic set:

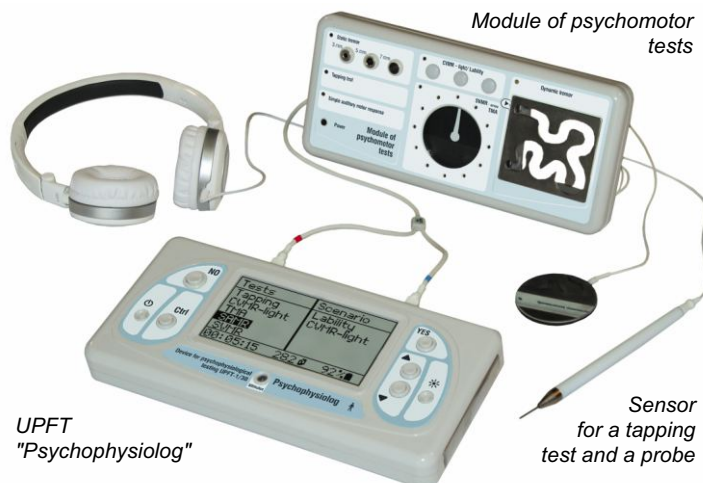
- Heart rate variability;
- Simple, complex and 3-stage complex visual motor response.



Module of psychomotor tests

17b

additional device to UPFT-1/30-"Psychophysiollog"



UPFT
"Psychophysiollog"

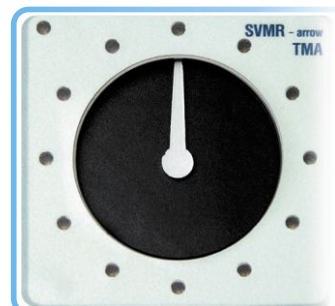
Sensor
for a tapping
test and a probe

Connecting to a device of psychophysiological testing UPFT-1/30 "Psychophysiollog" the Module of psychomotor test with the electrode pad, a probe and headphones allows expanding the library of tests with the following techniques:

■ **"SVMR-arrow"** – the detection of time for a simple visual-motor response to movement of the arrow.

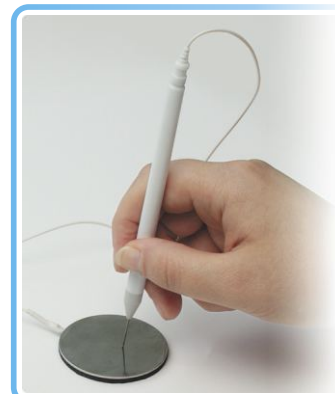
■ **"Time/Movement Anticipation"** – Evaluation of the speed and accuracy of response, dynamic eye and balance of the fundamental nervous processes.

■ **"CVMR-light"** – Evaluation of the level of the operator's performance by the parameters of complex visual motor response to light combination.



■ **"Lability"** – Detection of functional lability of nervous processes.

■ **"Tapping"** – Express diagnosis of strength of the nervous processes by measuring the dynamics of the hand movement rate.



■ **"Static tremor"** – Evaluation of the fine static sensorimotor coordination (the probe should not touch the wall of the hole during the test).

■ **"Dynamic tremor"** – Evaluation of the fine dynamic sensorimotor coordination (the probe moves in a winding slot path without touching the walls).



■ **"SAMR"** – Evaluation of the central nervous system by determining the time of simple sensorimotor response to auditory stimulation.

Option to kit up classes for the psychophysiological monitoring and psychological testing with a capacity of up to 30 people at a time

Autonomous patient transceivers-recorders¹ ABP-26 (see items **2a-4a**), **ABP-10** (see items **4b-5b**), **ABP-5** (see item **1a**), **ABP-4** (see items **12b, 10a**) and wireless modules and sensors can be combined into a wireless network (piconet²). Such unique opportunity allows patient to configure the required set of recorded electrophysiological parameters for carrying out necessary research under the conditions of maximum approximation to the natural activity of a test person or a test group.



Wireless universal Poly-4 module

- Record of signals by 4 polygraphic channels

Wireless Cardiorespiratory Module (PG-ECG)

- Record by 3 ECG channels and 1 rheopneumogram channel



Wireless pulse oximeter module

- Synchronous with EEG recording of patient arterial blood oxygen saturation (SpO_2), P-Flow, body position, snoring evaluation in sleep at PSG studies, CFM, neuro-monitoring, clinical and scientific research



- SpO_2 sensors

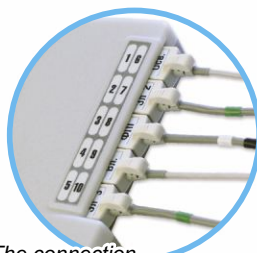


Wireless Respiration Module

- Record of respiration parameters by 4 channels

Autonomous patient transceiver-recorder ABP-10 (in the Poly-10 mode)

- Record of signals by 10 polygraphic or 9 EEG channels



The connection of polygraphic sensors



Power supply: accumulators or USB adapter

¹Autonomous patient transceiver-recorder

(ABP-4, -5, -10, -26) is the basic piconet device (server) that provides reception and synchronization of data from all supplied wired and wireless modules and sensors.

²**Piconet** is a group of devices that are not connected by wires (wireless technology Bluetooth®), but functioning and perceived by a user as a single multi-channel system, which provides accumulation of recorded data on the memory card of the main patient transceiver-recorder or telemetric data transition to a computer.

Wireless Movement Sensor

- Record of data on movement activity in three dimensions.



Stimulator SFN/FO-04 (autonomous photostimulator) with integrated LED matrix

- for functional tests on photostimulation during EEG studies in telemetric mode, and for phono-, electrostimulation (required headphones and wireless electrostimulator).

Wireless electrostimulator

- for somatosensory stimulation for patient's responses testing in ICU, and for somatosensory evoked potentials studies



Wireless GPS-tracker

- for tracking the position and motion path of a test person during autonomous studies

Patient button unit for detecting patient's response to presented stimulus

- is used for cognitive EP studies (CNV, P300) and EP studies with audiovisual stimulation.



Medicom MTD produces a wide range of sensors, electrodes and accessories for the record of most electrophysiological signals* used in functional diagnostics, neurophysiology, rehabilitation using biofeedback and research

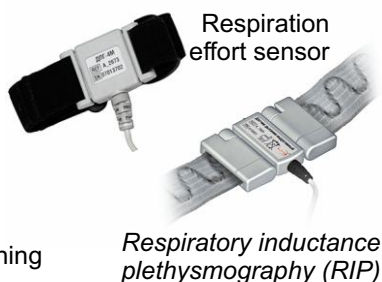
Sensors and electrodes have two types of connectors:

■ **Micro-8 plug connector** applied with portable wireless devices (see items 2a-5b, 10a-11b, 12b-14, 16);

■ **DIN connector** applied with stationary equipment (see items 6a, 6b, 12a).

Respiration effort sensor ("RespEff", RIP)

■ evaluates parameters of abdominal and thoracic respiration (breathing rate and amplitude, duration of inhalation and exhalation phases) and detects breathing disorders



Pressure Airflow Sensor ("P-Flow")

■ evaluates parameters of nasal respiration (breathing rate and amplitude, duration of inhalation and exhalation phases) over pressure difference in nasal cannula

Oral and Oro-Nasal Airflow Sensors (Thermistor "T-Flow")

■ evaluates parameters of oral respiration and detection of breathing disorders basing on temperature changes of oral airflow

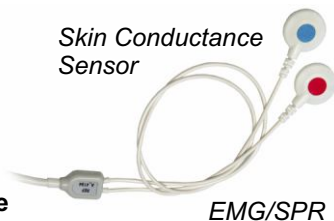


GSR Sensor

■ evaluates vegetative manifestations and emotional stress over phase component measurement

Skin Conductance Sensor

■ evaluates vegetative manifestations and emotional stress over phase and tonic component measurement



EMG or skin potential response (SPR) channel cable

■ for two disposable electrodes



Tetrapolar Rheographic Adapter (RT) and sensor set

■ for study of central hemodynamics and heart's pumping ability by Sramek's method

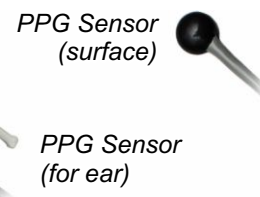
Bipolar Rheographic Adapter (RB) and sensor set

■ for study of cerebral (REG) and peripheral (RVG) blood circulation, and evaluation of central hemodynamics parameters and heart's pumping ability by Tischenko's method



Photoplethysmogram sensors (fingertip, surface, and for ear)

■ evaluates peripheral blood circulation parameters which characterize pulse blood filling and different vessels tone



Snore Sensor

■ to detect and quantitatively evaluate the severity of snoring in one's sleep

Wired Movement Sensor

Envelope EMG Sensors (EEMG-2 and EEMG-3)

■ evaluates selected muscle tone over envelope EMG measurement



Cables with 2 electrodes (for bipolar EEG derivation)

■ for EEG caps with eyelet holes, and cup and adhesive electrodes

Temperature Sensor

■ evaluates skin surface temperature in selected body area

Wet Sensor

■ for bedwetting detection

Light Sensor

PG-ECG Connector

■ is used for signal record by 3 ECG channels and 1 reopulmonography channel. It's connected to wireless cardio-respiratory module (PG-ECG), wireless Poly-4 module or patient transceiver-recorder ABP-10 (in the Poly-10 mode)



* See item 3b, 15 for multichannel EEG record electrodes

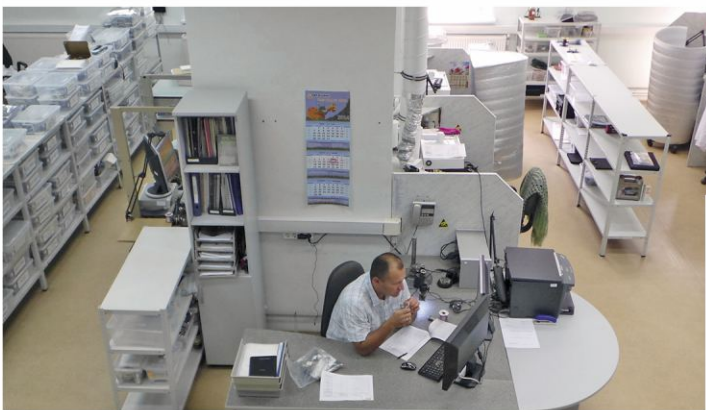


Medicom MTD Ltd, Research and Development Company, was founded on July 15, 1992. Professional team of scientists, engineers and programmers allows us to take a leading position in the Russian and international market of medical equipment for electrodiagnosis, neurophysiology and rehabilitation.



The company's policy is application of advanced computer and medical technologies in the development of equipment for EEG/EP studies, long term Video EEG Monitoring, Cerebral Function Monitoring, PSG/Sleep Diagnostics, neurophysiological, psychophysiological and psychological studies, and equipment for biofeedback training and rehabilitation, which is widely used in sports medicine, research and clinical practice.

Our quality management system in designing, development, manufacturing, realization and technical service of electronic medical equipment complies with the requirements of international standards **ISO 9001:2015** and **ISO 13485:2016**. The quality of medical devices complies with the requirements of Council Directive 93/42/EEC. Our equipment is produced under European standards EN 60601, EN ISO 14971, EN 62304 and regularly certified by British Standards Institution (BSI), one of the leading certification organizations.



Medicom MTD trademarks, such as "Encephalan", "Neuromyan", "Rehacor", "Egoscop", have been recognized by many medical institutions in Russia and abroad.

The company regularly takes part in the largest international medical exhibitions in Moscow, Astana, Dusseldorf, Dubai, New Delhi, Mumbai, etc.



Medicom MTD company develops dynamically, and is open for scientific and business cooperation to create innovative products, as well as for trading partnership and promotion of manufactured medical devices in the world market.





MEDICOM MTD

Research & Development Company



**For 30 years
we have been developing
and producing medical
equipment for you**

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Corporate website – medical equipment

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