

DX SYSTEMS

Research Production Enterprise

EEG · EMG · RHEO



DIAGNOSTIC MEDICAL EQUIPMENT

www.dx-systems.com

Engineering

Production

Sales

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Body speaks -
we translate

EEG systems

Computer electroencephalograph for EEG and evoked potentials recording and analysis with video monitoring feature

Computer electroencephalography devices of the BRAINTEST series allow recording, in various modifications, up to 32 EEG channels in the "10-20" and "10-10" systems synchronously with one ECG channel and two EOG channels. EEG is recorded in accordance with the examination protocol in standard mode or long-term monitoring mode (up to 48 hours of continuous recording). The quality of the electrode mounting is controlled automatically during the electrodes placement and during the entire period of EEG recording. The quality of contact will be displayed on the double colored front panel indicators. All BRAINTEST devices has a built-in photophonostimulator for routine EEG, special glasses and headphones for conducting evoked potentials.

The **DX BRAINTEST PLUS Basic** models (can be completed with the following sets: Basic, Basic EP, Basic Video, Basic EP Video) allows for routine EEG studies, long-term EEG video monitoring, registration and analysis of evoked potentials.

The total number of EEG channels is 16, 1 ECG channel and SPO2 channel for recording blood oxygen saturation.

2 differential EMG channels for electromyogram registration.

The **DX BRAINTEST PLUS Standard** models (can be completed with the following sets: Standard, Standard EP, Standard Video, Standard EP Video) allows for routine EEG studies, long-term EEG video monitoring, recording and analysis of evoked potentials.

The total number of EEG channels is 21, 1 ECG channel and SPO2 channel for recording blood oxygen saturation.

4 differential EMG channels for electromyogram registration.

The **DX BRAINTEST PLUS Extended** models (can be completed with the following sets: Extended, Extended EP, Extended Video, Extended EP Video) allows for routine EEG studies, long-term EEG video monitoring, registration and analysis of evoked potentials.

The total number of EEG channels is 32, 1 ECG channel and SPO2 channel for recording blood oxygen saturation.

8 differential EMG channels for recording the myoactivity of the patient's face, neck and extremities.



DX BRAINTEST PLUS Polygraph models (can be completed with the following sets: Polygraph, Polygraph EP, Polygraph Video, Polygraph EP Video), in comparison with other modifications of the BRAINTEST electroencephalographs, provides the widest range of diagnostic activities - routine EEG studies, long-term EEG video monitoring, sleep studies, recording and analysis of evoked potentials are available.

The total number of EEG channels is 32, 1 ECG channel and SPO2 channel for recording blood oxygen saturation.

8 differential EMG channels for recording the myoactivity of the patient's face, neck and extremities.

6 additional channels for connecting various sensors depending on the diagnostic questions posed to the doctor - for example, snoring sensor, pressure, chest/abdomen effort, body position, thermistor temperature sensor, etc.

EEG BRAINTEST series

Name	Number of channels	EEG	EOG	ECG	DIF	SPO2 sensor	Additional DC channels
DX BRAINTEST PLUS Basic	23	19	-	1	2	1	-
DX BRAINTEST PLUS Standard	33	23	2	1	6	1	-
DX BRAINTEST PLUS Extended	42	30	2	1	8	1	-
DX BRAINTEST PLUS Polygraph	48	30	2	1	8	1	6
DX BRAINTEST 16k	17	16	-	1	-	-	-
DX BRAINTEST 24k	24	21	2	1	-	-	-



BRAINTEST-Polygraph

EEG Routine

During the routine EEG tests user can follow the standard preinstalled protocols that includes eyes opening and closure, intermittent photic and phono stimulation, hyperventilation and custom type samples that can be added guided by the available clinical information. If necessary the user can mark any changes in the EEG or the patient's state and behavior throughout the recording. Bipolar (longitudinal and transverse) montages and referential montages (general, middle and initial) into routine EEG are available for quick switching. The application has visualization and calculation tools.

EEG EP

BRAINTEST allows for the registration and analysis of the auditory, cognitive (conditionally negative waiting wave and P300 phenomenon) long latency evoked potentials, visual Eps on a reversible chess pattern, flash or the reversible picture, that can be used for more in-depth examination of the functions of the patient's visual system.

EEG Video

Advanced digital continuous monitoring is realized with BRAINTEST-VIDEO. Patient video and EEG are recorded simultaneously, including at night with poor light, by using a special video camera and a cap with embedded electrodes. The video is saved to PC hard drive and is easy to process (compress, event mark) and print (by selecting a fragment of the video and electroencephalogram).



BRAINTEST-16

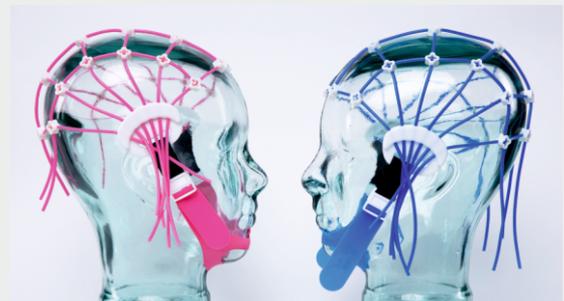


BRAINTEST-24

Basic BRAINTEST computer electroencephalography devices record up to 21 EEG channels and 2 EOG channels in the **BRAINTEST-24** configuration and up to 16 EEG channels in the **BRAINTEST-16** configuration in the "10-20" system simultaneously with one standard ECG lead. EEG is recorded according to the examination protocol in standard mode, long-term monitoring (48 hours without stopping) or in the EEG video monitoring mode.

Accessories

BRAINTEST devices are equipped with helmets with built-in electrodes, EEG helmets for disc electrodes, cup or bridge, depending on the tasks and preferences of the doctor. Helmets are designed for all age groups of patients, including very young children. The accessories also include special glasses and headphones that are used for visual and auditory evoked potentials.



All devices manufactured by the DX-System company can be used on either a desktop computer or laptop.

A mobile version of the device with a laptop, the device itself and all accessories in a special convenient case can be provided.

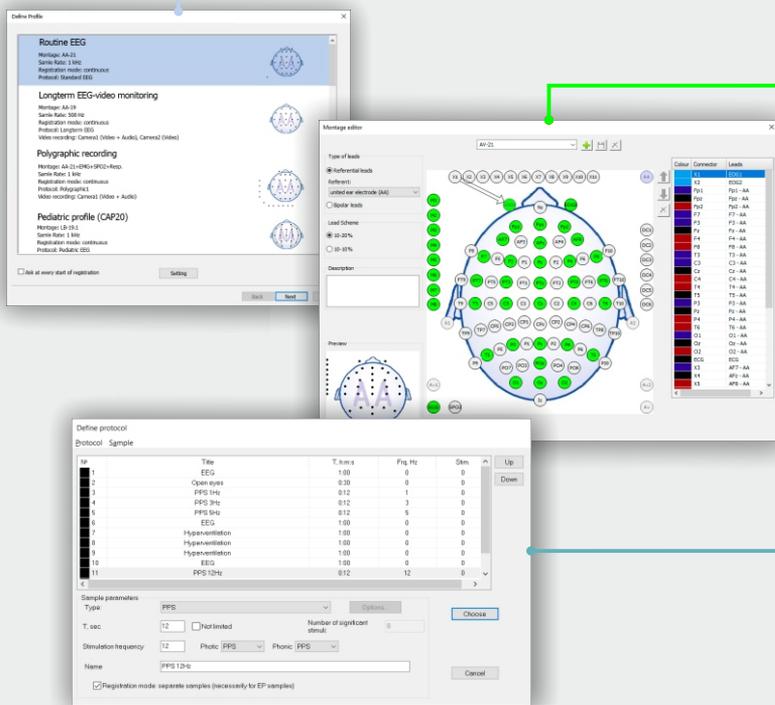
Technical specification

BRAINTEST

Number of EEG channels	16/19/21/23/30
Number of EOG channels	-/2
Number of DIF channels	2/6/8
Number of DC channels	-/6
SPO2 channel	-/1
Number of ECG channels	1
Range of input signal registration	1...200 000 mkV
Noise level	≤ 1 mkV
Frequency range	0.05 ... 500 Hz
High pass filter	0,16; 0,22; 0,53; 1,6; 2 Hz
Low pass filter	15; 30; 40; 50; 70; 100 Hz
Common-mode rejection ratio	≥ 110 dB
EEG/DIF sampling rate	500 /1000/ 2000 Hz

BRAINTEST

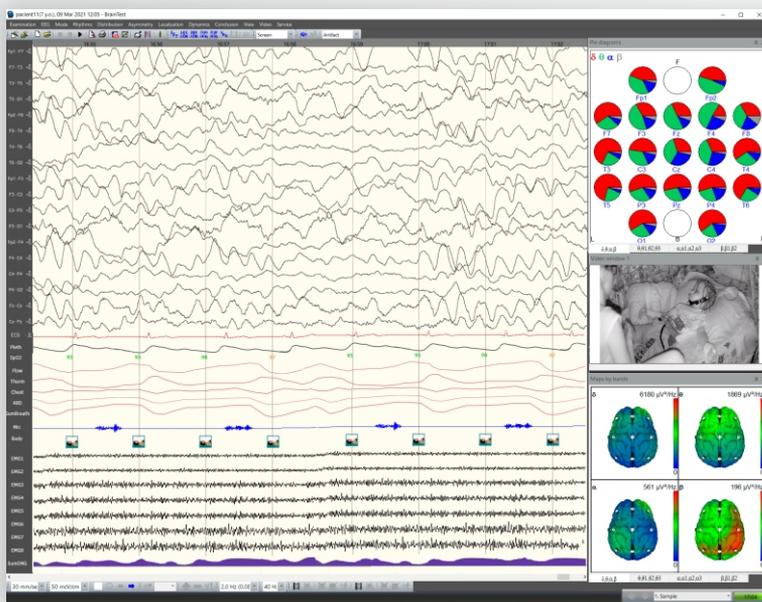
Software



User's workspace can be prepared for the specific mode of work with the patient.

Software has a tool that allows to work with **Montages**. It is intended to form the required mono- or bipolar sets of leads.

Protocols are used to structure the study according to the observed processes. Thus, you can use the appropriate **Profile** for a specific diagnostic task.

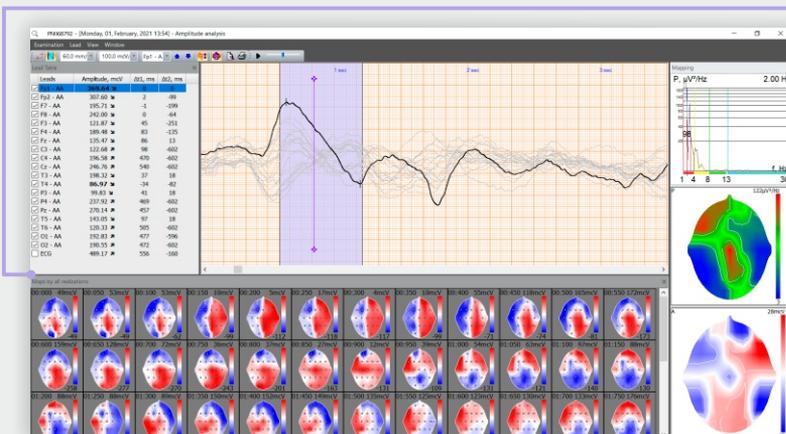


Multi-purpose leads allows to collect more complete patient data. **Synchronous video** registration - helps to observe patient in a separate room, as well as to fix external manifestations.

This set of instruments provides a better understanding of observed processes, that will more accurately define the type of pathology.

Impedance LED indicators that allow to observe the contact quality during the electrode placement and during the recording, will help to monitor the quality of the skin-electrode contact.

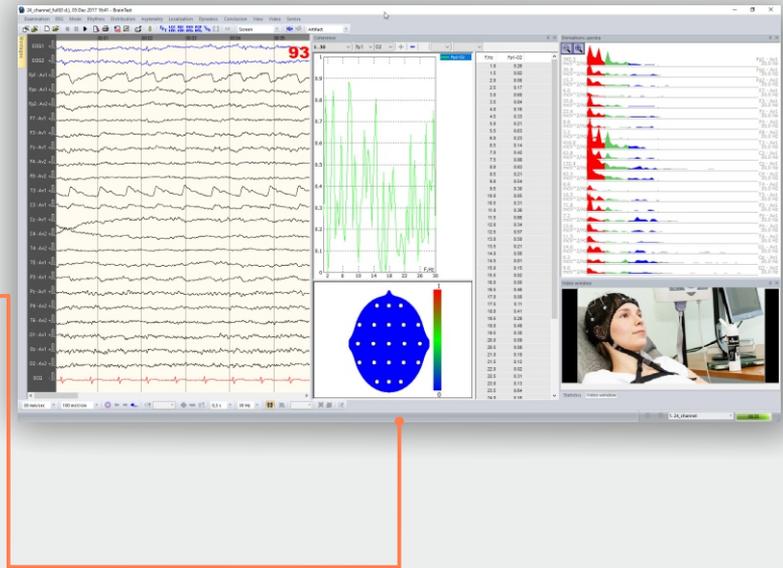
The software allows to create different kinds of 2D and 3D brain maps for any of the derivations, during the live recording or analysis.



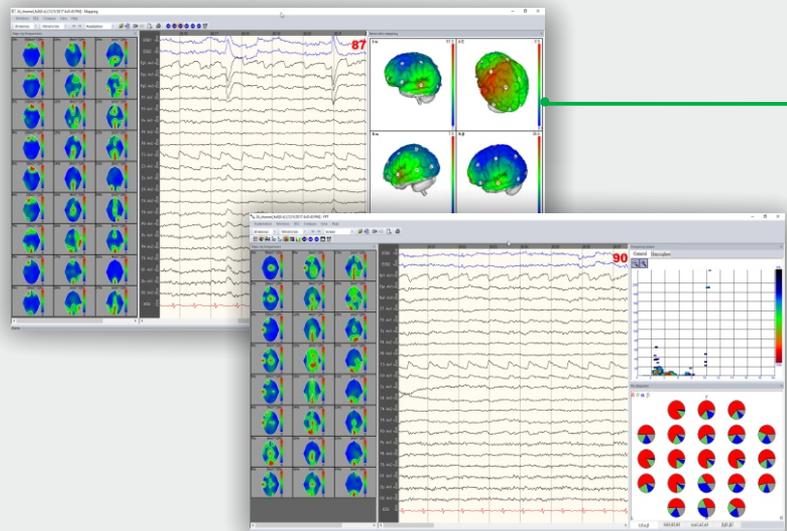
For many analysis tools is possible to analyze any recorded EEG fragment or the whole record.

One of the many tools is **Amplitude Analysis** that is used for the precise analysis of EEG phenomena. In addition to amplitudes, there are processed chronodispersion of peaks, that is useful for identifying the primary generator. Amplitude mapping allows to visualize polarization processes.

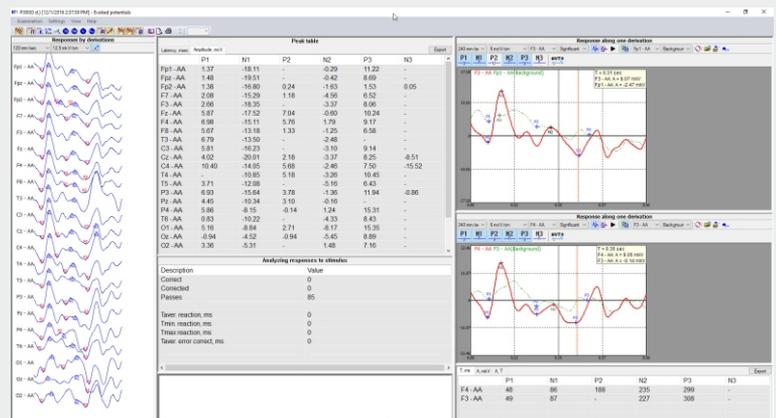
The device software provides a wide range of methods for processing electroencephalograms and forms for presenting the results of its analysis: viewing in different lead systems, sub-band filtering, EEG editing, EEG filtering, comparing two electroencephalograms, **spectral analysis** (based on Fourier or Wavelet – transform), correlation, auto- and cross-correlation, coherent, bispectral analysis both in the form of tables and numbers, and in the form of graphs, diagrams and allocation maps.



The electroencephalograph provides for **mapping** wide variety of data: power of the frequency bands, median frequency of the spectrum, canonograms (range ratios), power at all analyzed frequencies, EEG amplitudes, correlation coefficients and coherence coefficients. Any EEG fragment can be mapped, an area to be analyzed can be selected, or an integral characteristic can be obtained over a period of one of the functional tests. To facilitate the visual perception of the maps in the system, their three-dimensional version is provided.



BRAINTEST software allows to process wide variety of data collected during the registration of the auditory, cognitive and visual **evoked potentials** including the patient's responses on the events.



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