

Psychophysiological Telemetric System "Rehacor-T"

wireless
technologies



www.medicom-mtd.com
www.reacor.ru
www.egoscop.ru

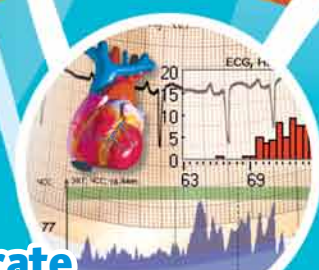


Biofeedback
training

Procedures
control



Psychological and
psychophysiological
testing



Heart rate
variability analysis

CE 0086



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Forms of BFB signals presentation to patient

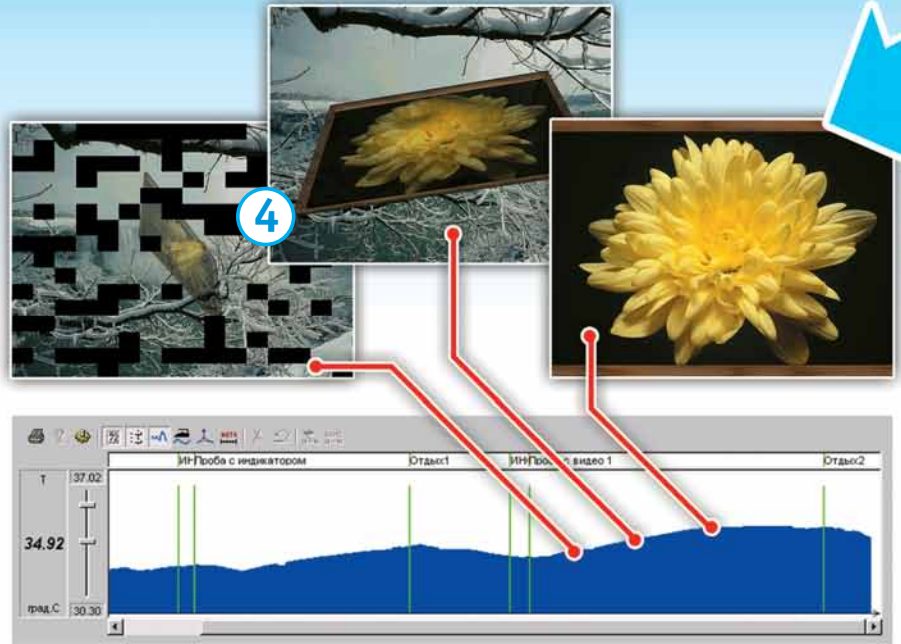
Visual

Simple images: graphs, scales, figures (1), images, videos;

Game mode: two(2)- and three-dimensional (3);

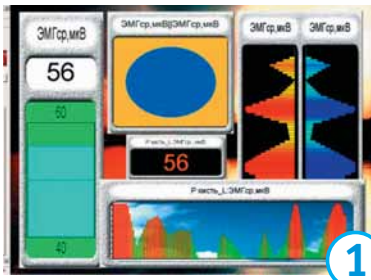
Dynamic images: three-dimensional and noise-like conversions of images (4) and videos, morphing of images (5);

Service messages: screensavers at the beginning and at the end of procedures, instructions (6).



Audio

BFB sounds are presented by means of acoustic system or the head phones, connected to the computer.



Examples of BFB trainings used

Galvanic-skin response

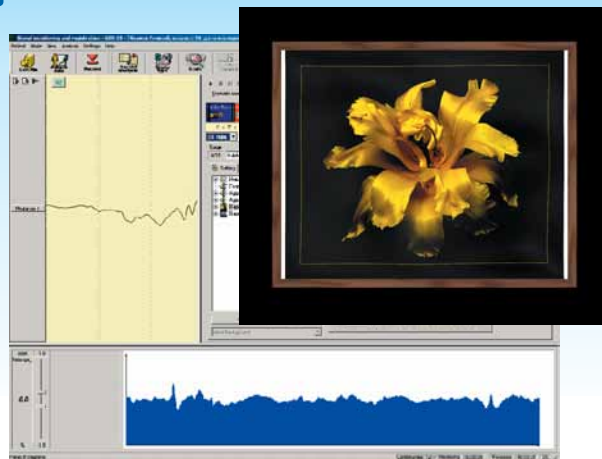
Biofeedback procedures by GSR are meant for suppression of excessive vegetal activation in reply to presentation of stress stimulus and ensure functional training therapy of people with phobic-vexatious symptoms, psychological adaptation improvement, improvement of psychological stability to stress factors.

The technology of stress resistance improvement includes outline of GSR biofeedback and stress stimuli. Moderate pain electrostimulation is used as stress stimuli.

At the first stage oriented GSR-reaction to the audio stimuli of 2 types is extinguished.

At the second stage classic acquired defensive reflex to one of audio stimuli is formed.

At the third stage a patient watching the change in his GSR to neutral and alarm audio stimuli, develops the skill of transferal of his neutral state to the conditions, contributing to the increase in his emotional tension.



Impedance Plethysmography

Pulse blood filling improvement trainings are recommended in the case of vegeto-vascular dystonia syndrome with symptoms of pulse blood filling reduction, temporary and severe cerebral blood circulation disorders, discirculatory encephalopathy.

Pulse blood filling reduction trainings are recommended in case of vegeto-vascular dystonia syndrome with symptoms of pulse blood filling excess or sick headache.

Arteries tone reduction trainings are recommended in case of hypertone symptoms.

Venous outflow improvement trainings are recommended in case of venous outflow disorders.

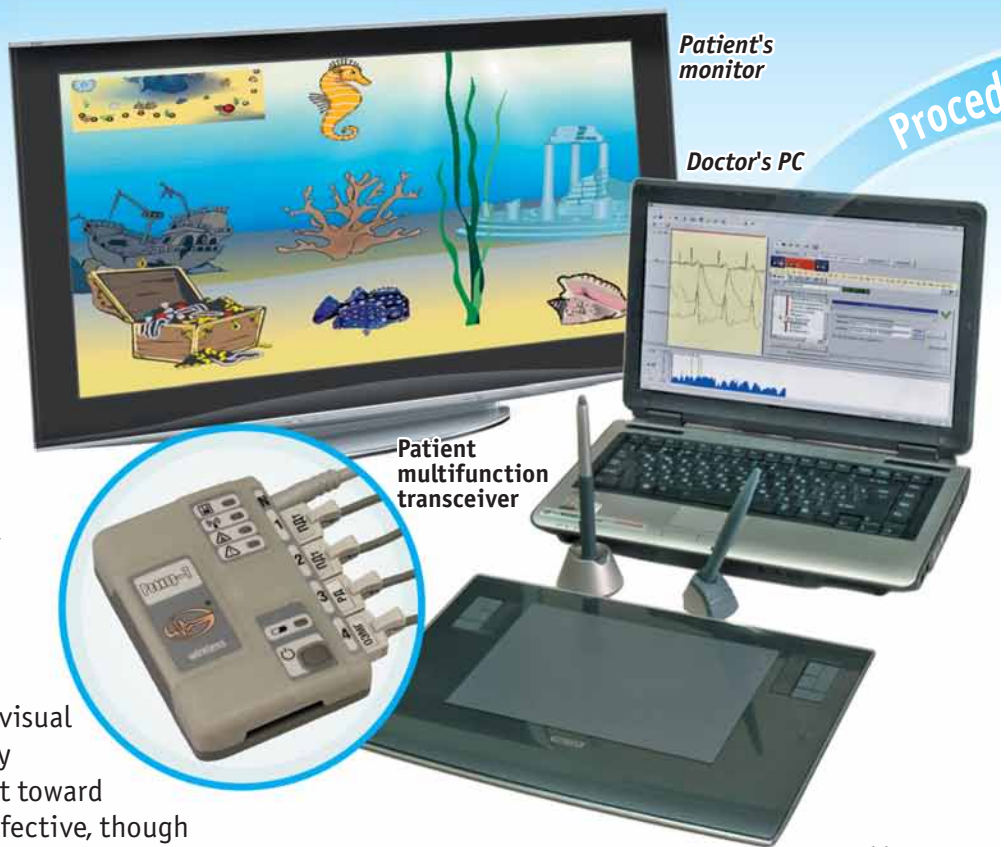
The exterior of Psychophysiological Telemetric System "Rehacor-T" for training with Biofeedback

Biofeedback

The four-channel wireless patient multifunction transceiver ABP-4 intended for recording different physiological signals, such as galvanic skin response (Fere), electroencephalogram, temperature, respiration effort, electrocardiogram, electromyogram, envelope electromyogram, photoplethysmogram, skin potential, etc.

Number of recorded channels for BFB-training can be enlarged with wireless modules: "Poly-4" (4 auxiliary channels), pulseoximeter (SpO2), cardiorespiratory module and wireless movement sensors.

A change of physiological signals controlled by patient is converted into a change in different parameters of audio-visual forms. Training game modes, additionally stimulating the search activity of patient toward change in internal state, are especially effective, though traditional BFB-trainings are still actual. An option of Objective psychological analysis and testing "Egoscop" before and after BFB procedures harmonically complements the "Rehacor-T" system (P.T.O.).



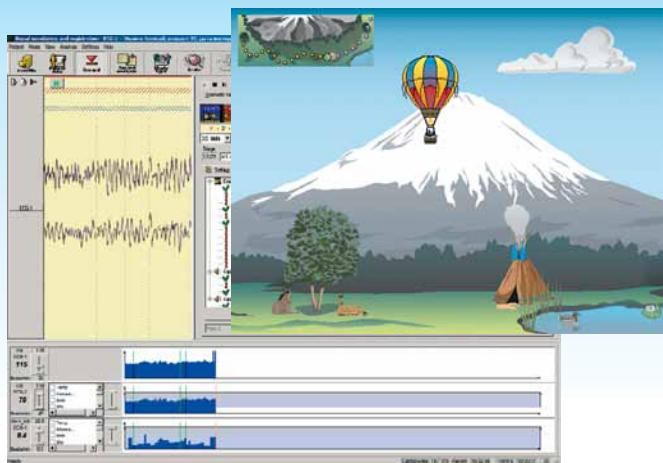
Patient's monitor

Doctor's PC

Patient multifunction transceiver

Tablet sensor for objective psychophysiological analysis and testing (see "Egoscop" T.O.)

EEG



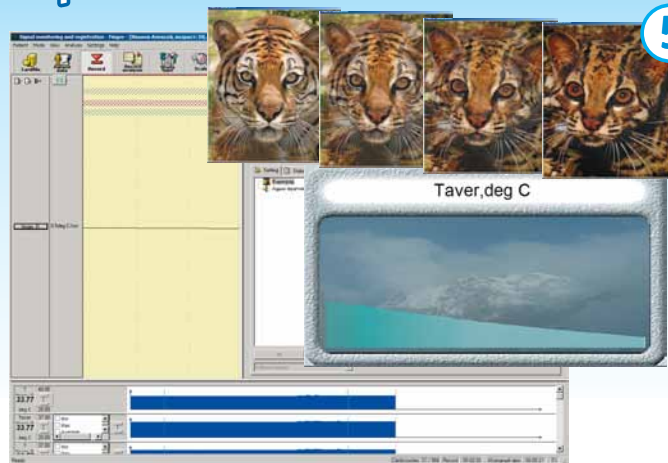
Alpha-training is meant for stress resistance improvement, it helps to attain deep psychological relaxation and to activate creativeness.

Beta- and theta trainings are applied for Attention Deficit correction and Hyperactivity Disorder decreasing.

Alpha-theta training is used to overcome different pathologic addictions (narcomania, alcoholomania, etc.)

Sensorimotor rhythm training increases convulsive activity limen under the conditions of epilepsy.

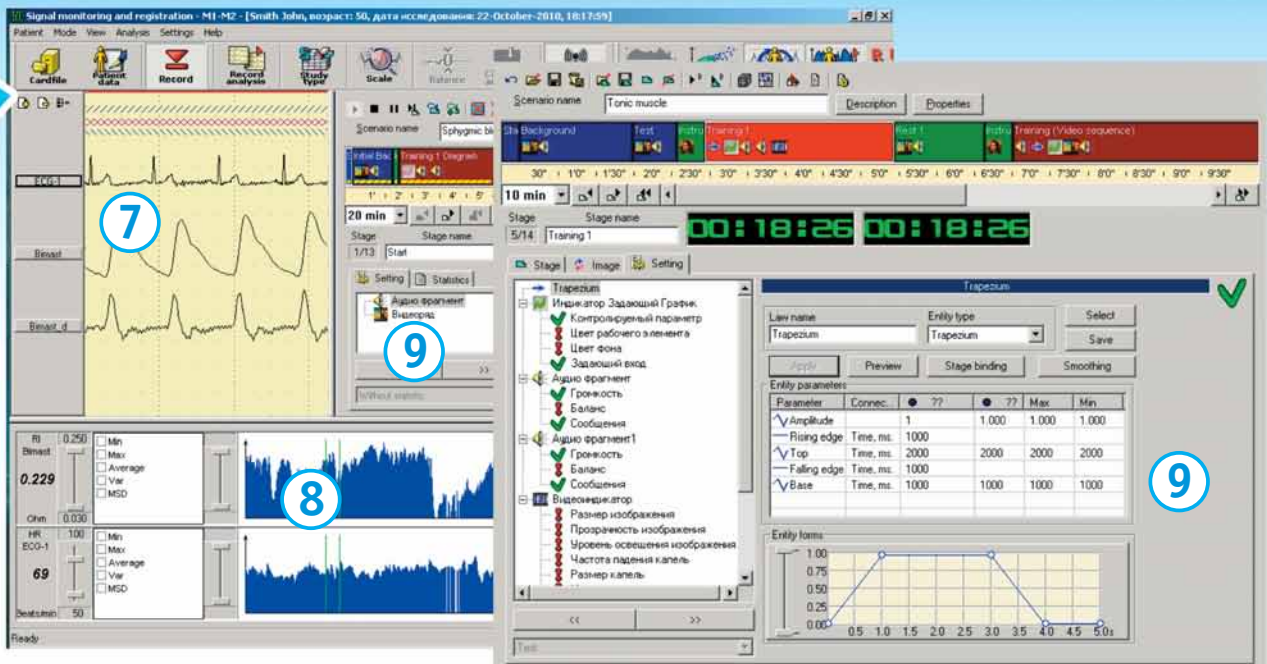
Temperature



Skin temperature increase training allows lowering the excessive tone of arteriola vascular walls by means of lowering the activity of sympatic section of VNS, and is applied for zonal thermoregulation improving (the increase of temperature of legs and arms peripheral zones) under the conditions of diseases manifestative in reduced blood supply of these zones because of vasomotor spasm, partial or complete obturation of arterial vessel lumen (atherosclerosis, thrombosis, vasculitis, etc.)

Instructor's workplace screen

Procedures control



Signal window (7)

It displays real-time waveforms of physiological signals being recorded.

Trend-graphs window (8)

Compressed presentation of calculated indices in the real time

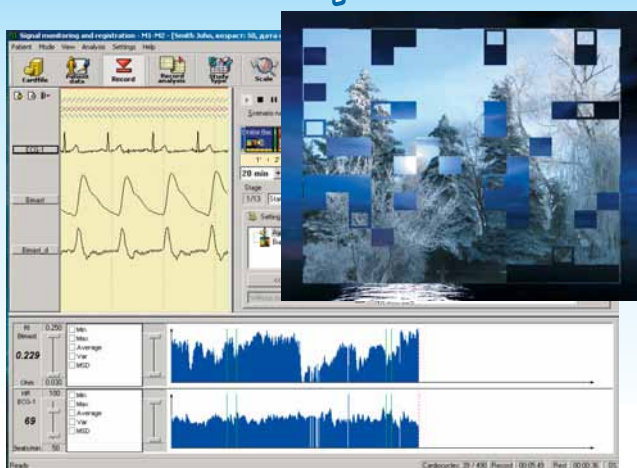
Obviously shows dynamics of patient's state during study cycle

Any number of represented indices is available

Procedure editor (9)

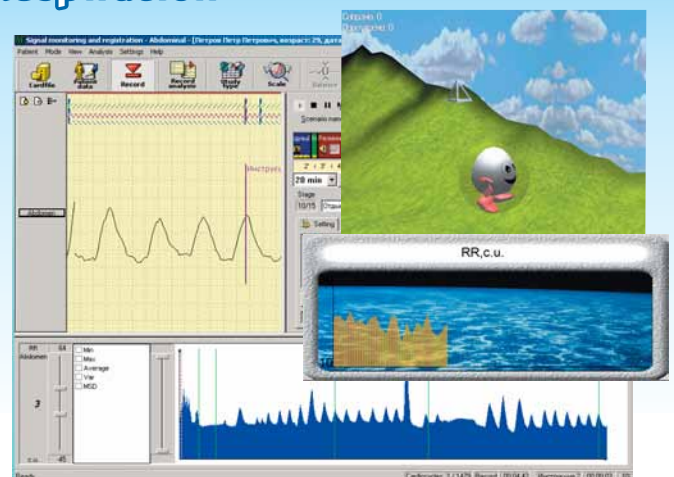
The powerful and convenient editor of procedures scenarios with wide spectrum of customizable parameters of BFB-training and the library of procedures are effective creative tool for the realization of different training strategies taking into account the age, aesthetical, intellectual and other special peculiarities of the patient.

Blood circulation parameters



Procedures of arteries tonus regulation (systolic wave amplitude, systolic wave amplitude and RR-interval, pulse wave transmission time) are used for nervous system functional state normalization, for cardio-vascular disease prevention, correction of arterial tension indices, blood filling and etc. under the conditions of different pathosises (secondary hypertension, arterial hypotension syndrome, etc.)

Respiration



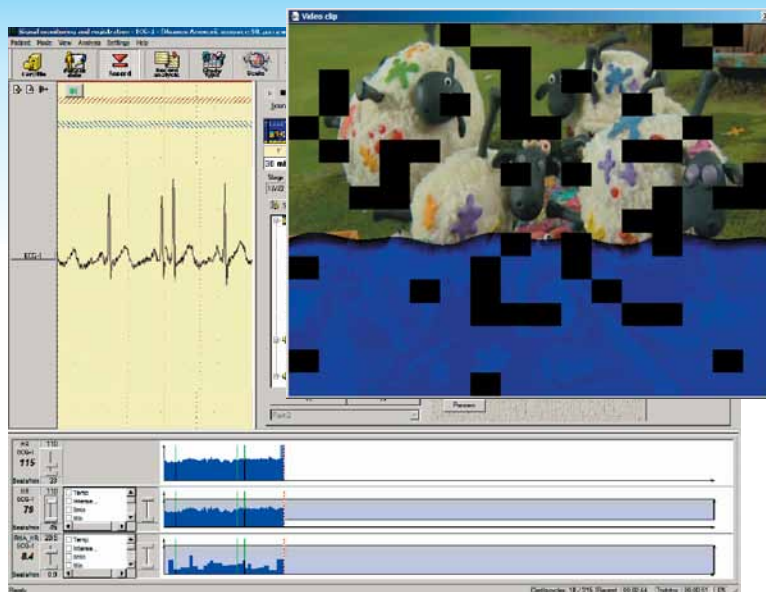
Meant for treatment of obstructive respiratory system damages, some circulatory injuries, vegetative-vascular dystonia syndrome, neurotic and neurosis-like syndromes.

The aim of the training is forming the adequate respiratory stereotype with simultaneous transition to the diaphragmatic respiration type, which ensures not only lungs work improvement, but also influences other functions, including psychic, and improves body viability.

Examples of BFB trainings used

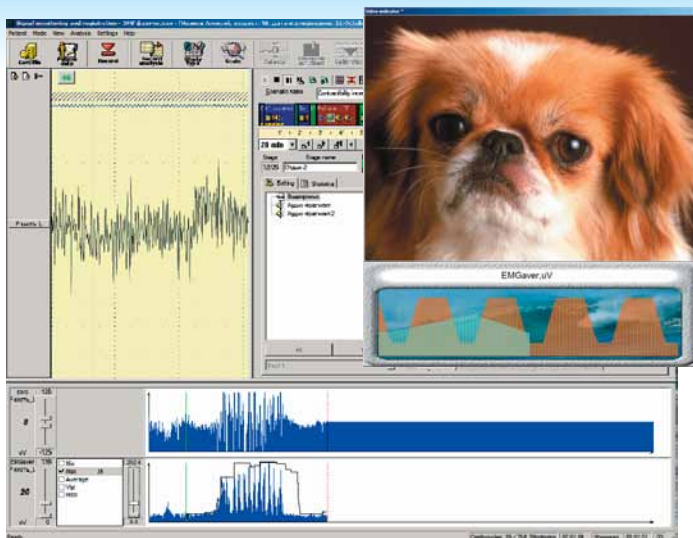
Heart rate

Heart rate training is recommended in case of cardiorespiratory system diseases, decrease level of organism immunity, stress reactions and the psycho-emotional overstress accompanied by vegetative disbalance. Also it can be used for arterial pressure normalizing, increasing the physical capacity for work, getting rid of complaints on heavy heart and feeling bad. Heart rate variability procedures allow eliminating VNS parasympathetic influences deficit and increasing immunity to cardiovascular system disorders under the conditions of psychoemotional stress.



Electromyogram

EMG training is used for correction of central and peripheric motor disturbances of different genesis by means of random control of motion activity improvement, for decreasing of spasticity and hyperkinetic activity, for neurosis reduction by means of excessive muscle activity reduction, restoration of different muscle groups interaction (synkinesis, reel foot, etc.)



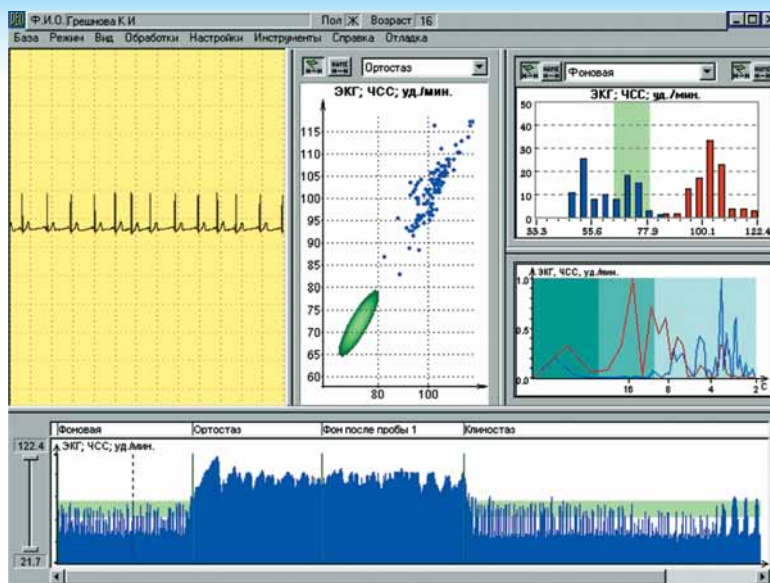
Optional capability of patient's functional state evaluation

Heart rate variability

It is used for vegetative nervous system assessment on the basis of heart rate variability.

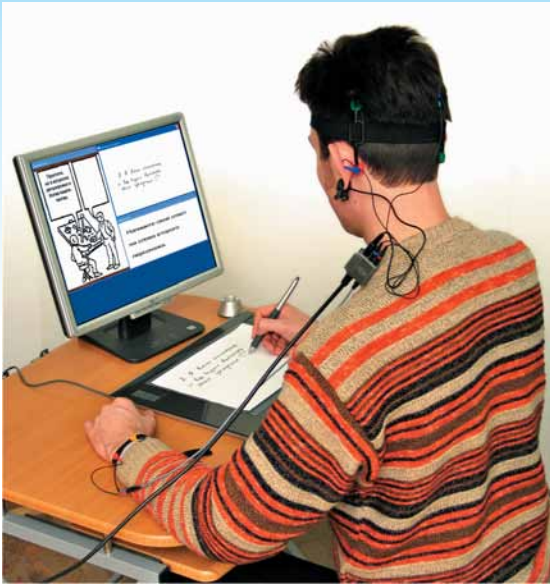
Also it can be used as the additional means of patient's state dynamics analysis under conditions of pharmacotherapy, physical and psychoemotional stresses, and also for the control of treatment effectiveness. It allows disclosing VNS dysfunctions in different situations during sleep and wakefulness

In the process of conducting of functional tests or long-term monitoring, carrying out of special screening-tests for initial vegetative tone estimation, vegetative reactivity and vegetative functions of patient, is possible.



Final diagnostic estimation is realized on the basis of regulator systems adequacy index.

Objective psychophysiological analysis and testing



Any questions and statements can be used as stimulating, any voice and musical fragments, images or video clips.

Special set of sensors and electrodes allows simultaneously with task implementation recording of galvanic skin response signals, photoplethysmogram, electrocardiogram and electroencephalogram.



Instead of the graphic tablet sensor monitor can be used. Example of Schulte testing (attention switch speed and working capacity study).

- new effective instrument for objective analysis and testing, based on combination of psychophysiological methods of conscious and subconscious emotional reactions evaluation and original realization of projective psychological methods.



This original approach to personality study we called **Egoscropy** (Latin **ego** "I" + Greek **skopeō** "to investigate")

Egoscropy method is based on the combined analysis of physiologic indices trends and parameters of person's behavior while completing the tasks of psychodiagnostic scenarios on a special sensory graphic tablet or monitor.

Basic scenario set is meant for carrying out common methods: psychological inquiry tests, projective tests, including drawings, cognitive methodics to evaluate learning capability and new knowledge perception, different psychophysiological techniques.

The application has integrated scenario editor which allows enlarging the scenario library using text, graphic and audio tests with an opportunity to work on a sensory pad-monitor.

Egoscropy integrates and refills with new content all previously known psychological and psychophysiological methods by means of including emotive-evaluative scale.

#	type	Semantic cluster	Parameter	M	SD		P lev.
1	P	Faults	XYZ	28	7		p<0.001
2	P	Drugs	XYZ	6	7		p>0.05
3	P	Thefts	XYZ	1	6		p>0.05
4	P	Contacts with criminal group	XYZ	-4	6		p>0.05
5	P	Gaming	XYZ	-4	6		p>0.05
6	P	Criminal offences	XYZ	-4	6		p>0.05
7	P	Serious diseases	XYZ	-4	6		p>0.05
8	P	Unauthorized absences	XYZ	-4	6		p>0.05
9	P	Alcoholism	XYZ	-7	6		p>0.05
10	P	Mental diseases	XYZ	-7	6		p>0.05
11	P	Weapon	XYZ	-9	6		p>0.05

Test results are analyzed with the help of the profile of sense-emotional meaning reflecting test person reaction to the set topics (semantic clusters), evaluation of evidence and variability of test person emotive reactions to the tasks. In the picture you can see the profile for one of various scenarios that reflects the most denominated reaction of a test person to the topic "Faults".

Diagnostics of the vegetative nervous system on the basis of heart rate variability and psychological and psychophysiological attesting combined with biofeedback rehabilitation procedures ensure the effective realization of the technological cycle "DIAGNOSTICS-REHABILITATION-CONTROL".

Possible additional fields of EGOSCOPE application:

- Detection of possible causes of psycho-somatic disorders;
- Detection of nonconscious problems in social, professional and private life;
- Diagnostics of life exhaustion syndrome;
- Detection of pathologic addictions (narcomania, alcoholism, etc.) or predisposition to them;
- Control of rehabilitation action effectiveness;
- Objective control of emotive reactions to presentation of information of different character in order to detect the effectiveness of promotional materials, user interface, etc.