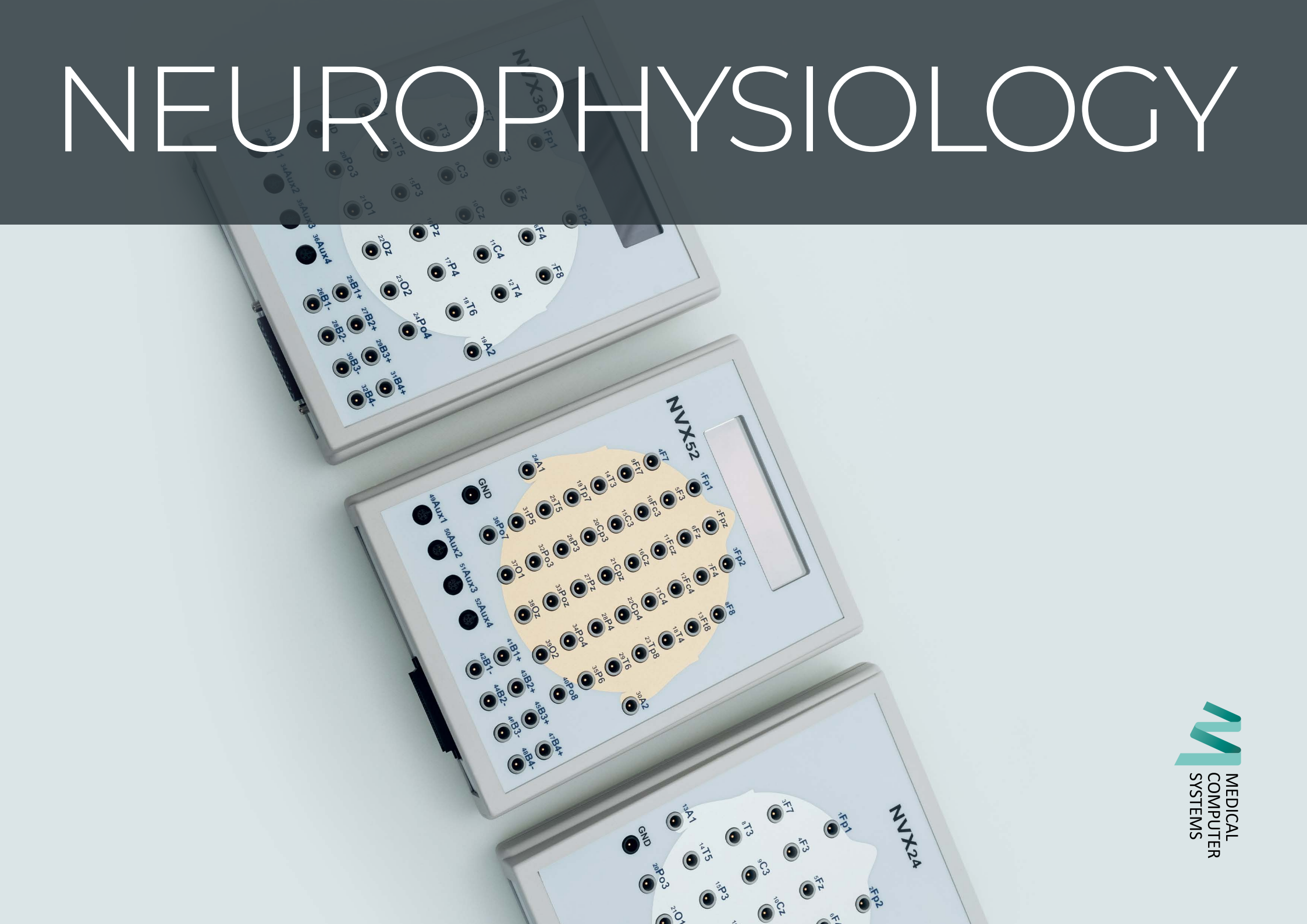
NEUROPHYSIOLOGY



MEDICAL COMPUTER SYSTEMS

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About us

Since 1993 year company Medical Computer Systems Ltd. (MCS) successful design and manufacture high-tech devices and accessories for medical and research applications.

Projects include a wide spectrum of diagnostic and therapeutic equipment: DC EEG amplifiers for clinic and research, including Multichannel MR-compatible EEG amplifiers and wireless EEG amplifiers, tES systems, ECG screening systems, EEG and ECG accessories, etc.

Partners of MCS are leaders of EEG equipment for scientific research and medical world market. Company supports the international quality system ISO 9001, ISO 13485 and manufactures many products with CE mark.

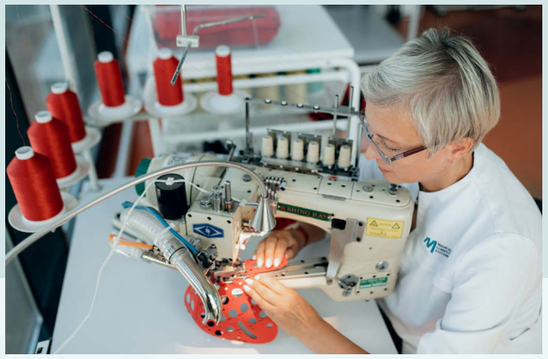
MCS provides a complete engineering solution in the medical & research devices outsourcing development and production as OEM.

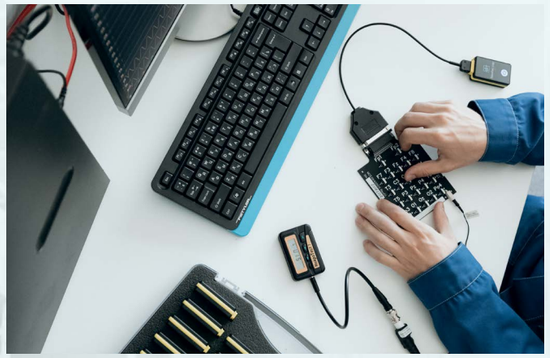
Multi-disciplinary team of experienced engineering and researchers, continuous progress in the developments and production technologies allow to stay company on top of innovation.

Video about us















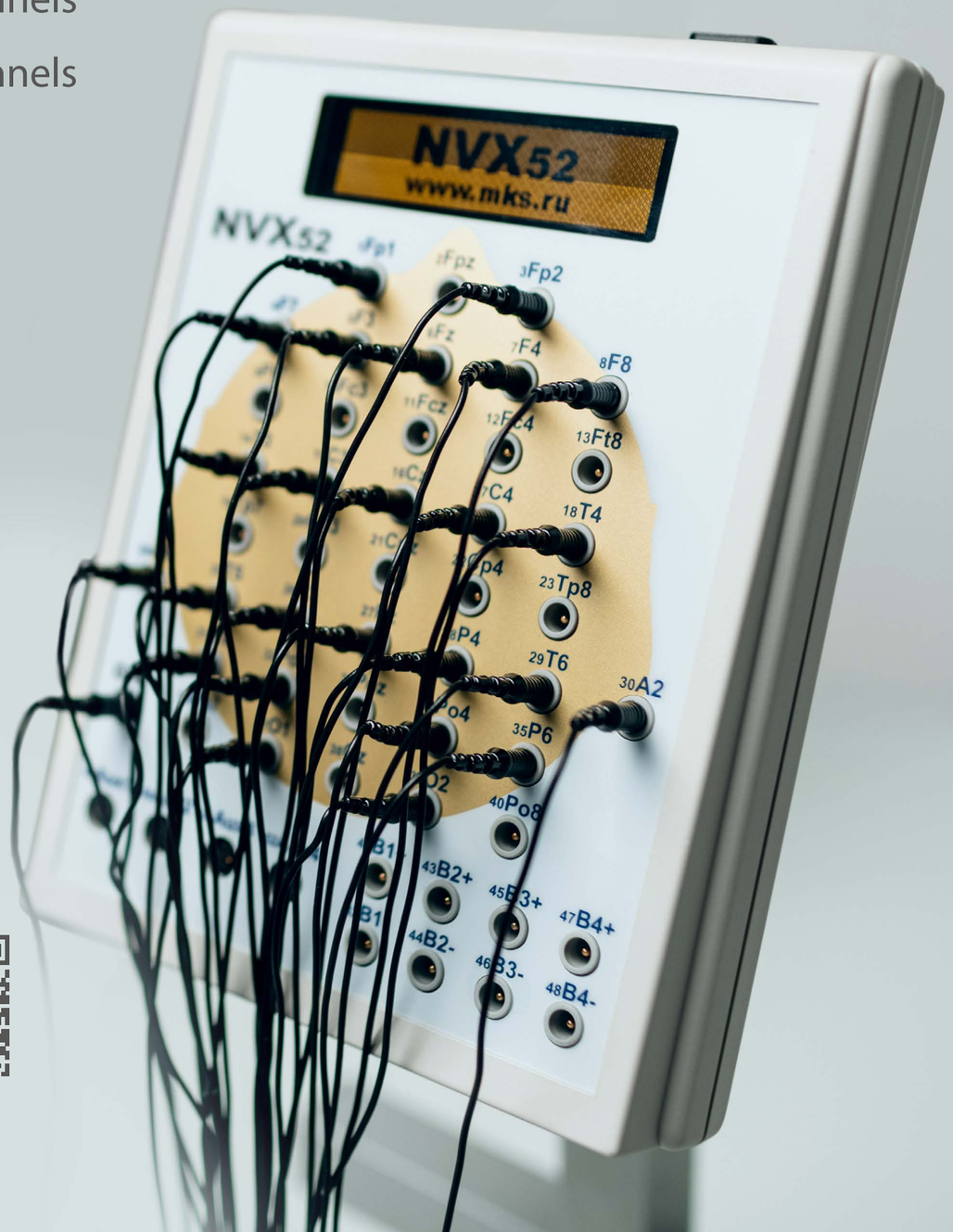
NVX – 24 / 36 / 52

DC EEG amplifiers

24 channels

32 channels

48 channels



Video about
NVX – 52

NVX is DC amplifier with 24, 32 or 48 monopolar EEG channels and 4 auxiliary bipolar channels for sensors NeoSens. The device is used in training systems, clinical and scientific research as a part of computer-based research system for short-term recording of the electrophysiological signals, primarily EEG.

NeoRec software FREE

NeoRec is software for the acquisition of EEG and other biomedical signals in scientific or medical research. The program records the signals in various file formats for further analysis and processing by third-party software.

Recorded files can be saved in different formats (EDF+ 16 bit, BDF+ 24 bit, GDF 32 bit) or transmitted online via stream LSL (Lab Streaming Layer) for analysis by third party software as MATLAB / EEGLAB, OpenViBE etc.

NeoRec is a free software for all models of EEG amplifiers produced by MCS, including NVX amplifiers series.

Specification

Model	NVX 24	NVX 36	NVX 52
EEG DC monopolar channels	24	32	48
AUX bipolar channels	–	4 galvanically isolated from EEG for probes	
TTL triggers	1 input / 1 output	9 input / 1 output	
Display	–	Graphic OLED	
EEG dynamic range	±400 mV		
EEG channel's input impedance	more than 100 MOhm @ DC		
EEG channel's noise	less than 0.9 uV p-p @ 0,1...30 Hz		
EEG test signal	200 µV (±1%), 1 Hz		
Electrode impedance measurement range	1...120 kOhm (±10%) @ 30 Hz		
AUX channel's dynamic range	0...+4 V		
AUX channel's input impedance	more than 100 MOhm @ DC		
AUX channel's noise	less than 15 uV p-p @ 0,1..30 Hz		
AUX probe powering	+5 V (±5%). Up to 15 mA per probe with electronic protection		
Digitalization	24 bit, 6th order delta-sigma modulator with 64x oversampling, one converter per each channel		
Sampling rate	250, 500, 1000, 2000 Hz @ all channels 5000 Hz @ 24 EEG monopolar or bipolar channels 10000 Hz @ 16 EEG monopolar or bipolar channels 50000 Hz @ 4 EEG monopolar or bipolar channels		
Lower cutoff frequency	0 Hz (DC)		
Upper cutoff freguency	75 Hz (-3dB @ 250 Hz); 175 Hz (-3dB @ 500 Hz); 300 Hz (-3dB @ 1000 Hz); 500 Hz (-3dB @ 2000 Hz); 1650 Hz (-3dB @ 5000 Hz); 4900 Hz (-3dB @ 10000 Hz); 16000 Hz (-3dB @ 50000 Hz)		
Control and powering	from USB +5V, 450 mA		
Safety	IEC 60601-1, IEC 60601-2-26, class IIa, type BF		
Size	155 x 110 x 45 mm		
Weight	less 650 gr		

SDK for software development for PC applications is provided by request.

NEUROvisor

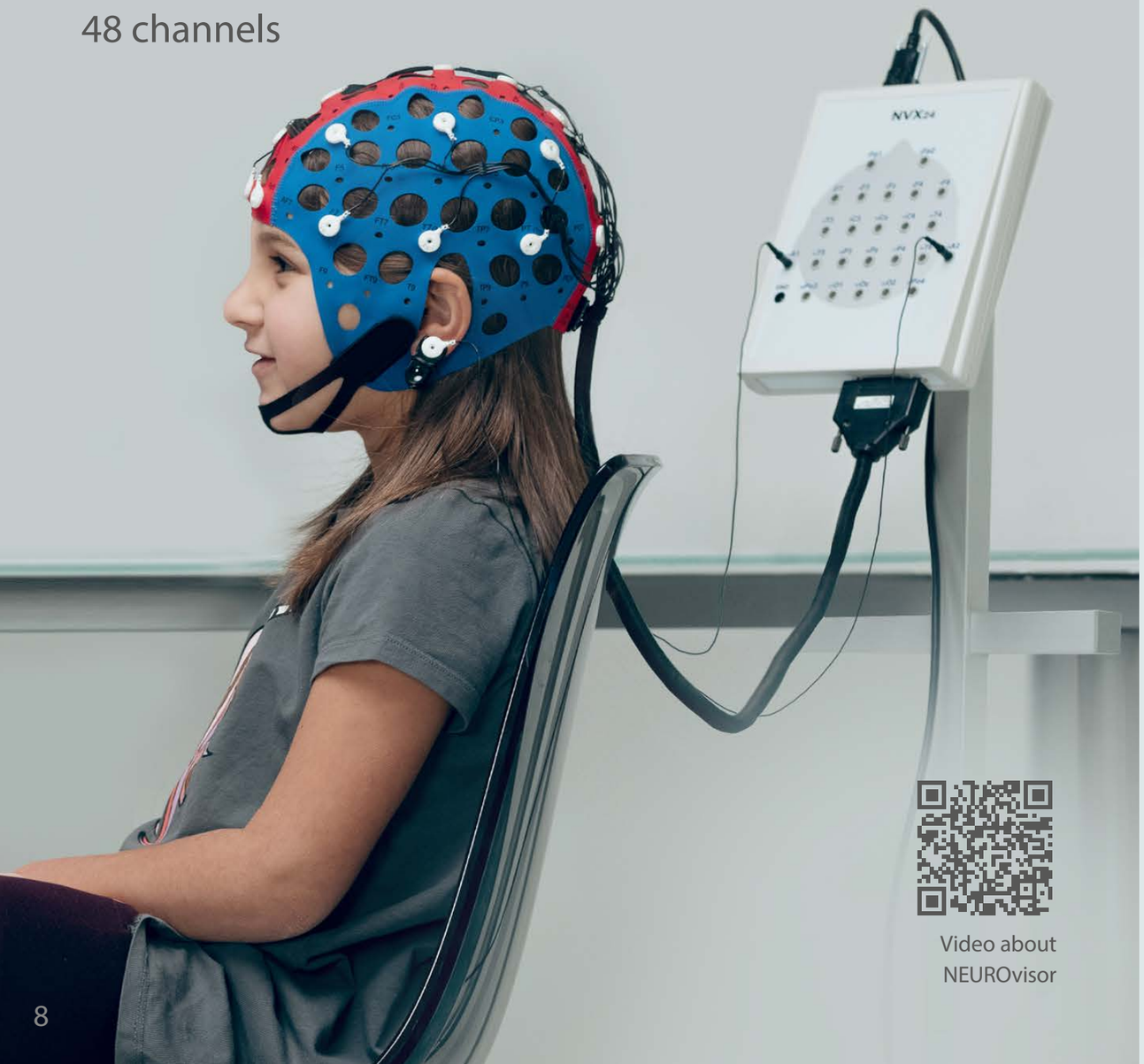
Clinical system

DC EEG amplifiers

24 channels

32 channels

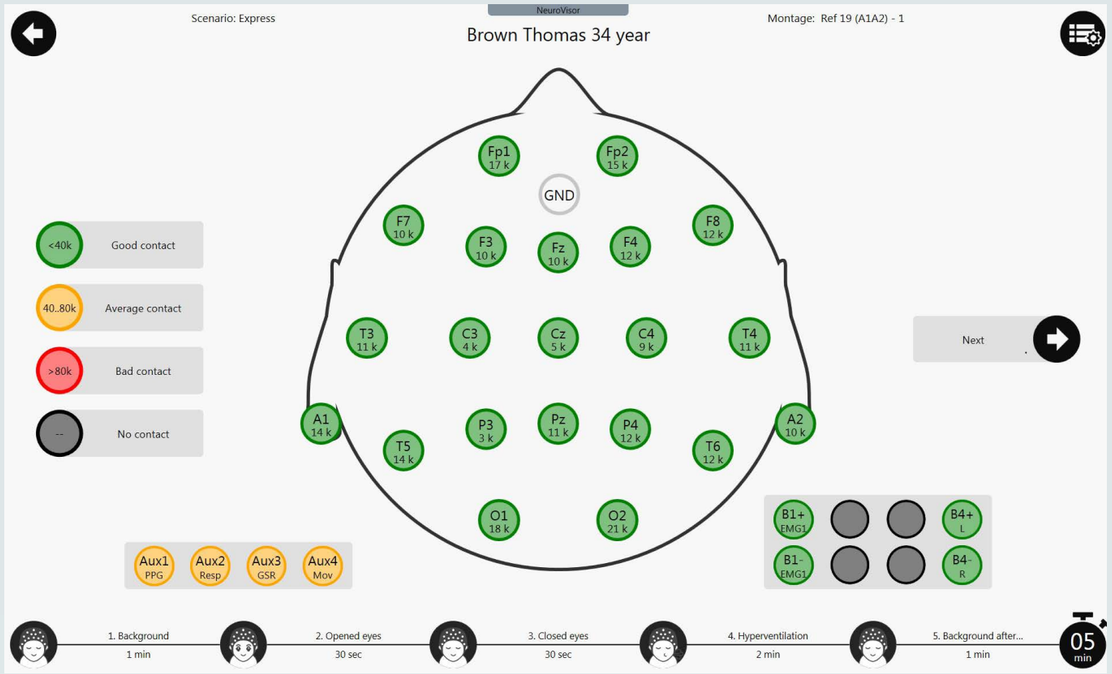
48 channels



Video about
NEUROvisor

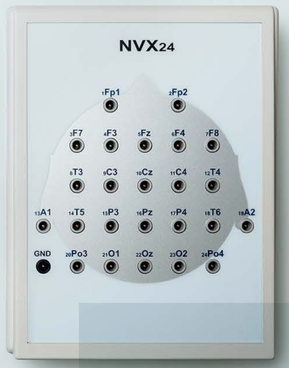
The most friendly clinical EEG system

Based on NVX amplifiers it has been developed a clinical EEG system NEUROvisor for use in functional diagnostics rooms, medical departments of multidisciplinary and neurological hospitals, health centers, clinics and research institutes.



NVX 24

24 EEG channels
Clinical EEG



DB25 connector
for EEG cap

NVX 36

32 EEG channels
4 AUX channels for probes
OLED display
Clinical EEG
EP & ERP



DB25 connector
KEL40 connector
for EEG cap

NVX 52

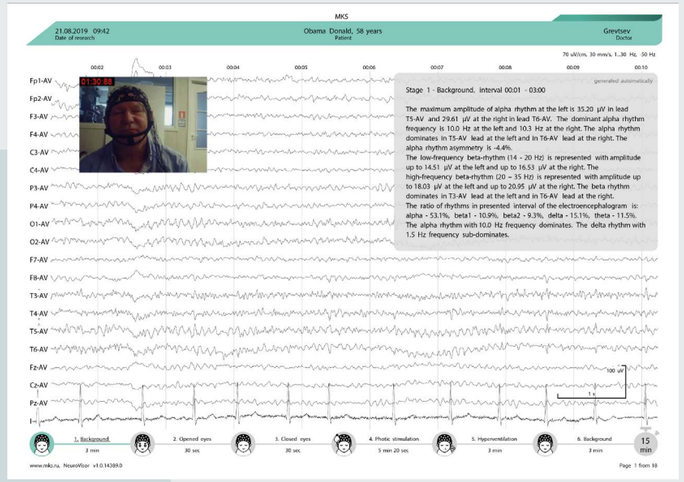
48 EEG channels
4 AUX channels for probes
OLED display
Clinical EEG
EP & ERP



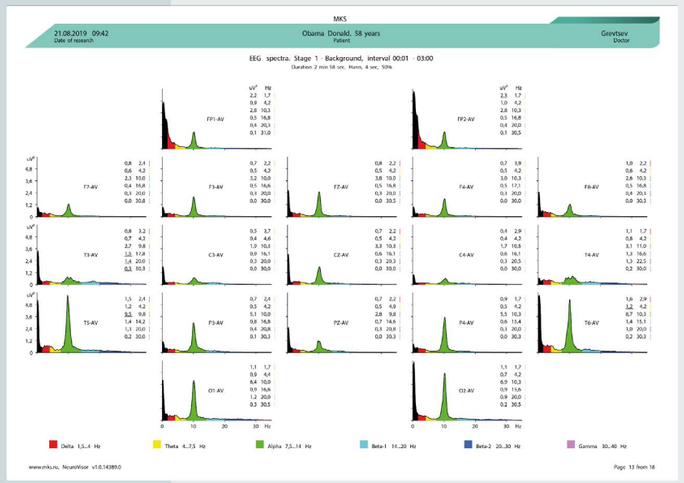
KEL50 connector
for EEG cap

SOFTWARE

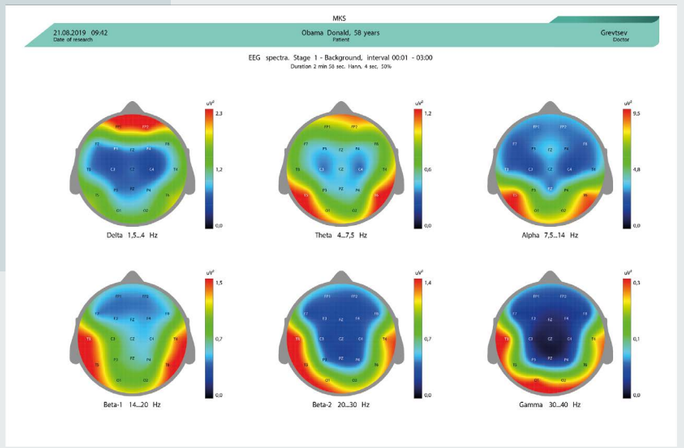
NEUROvisor software



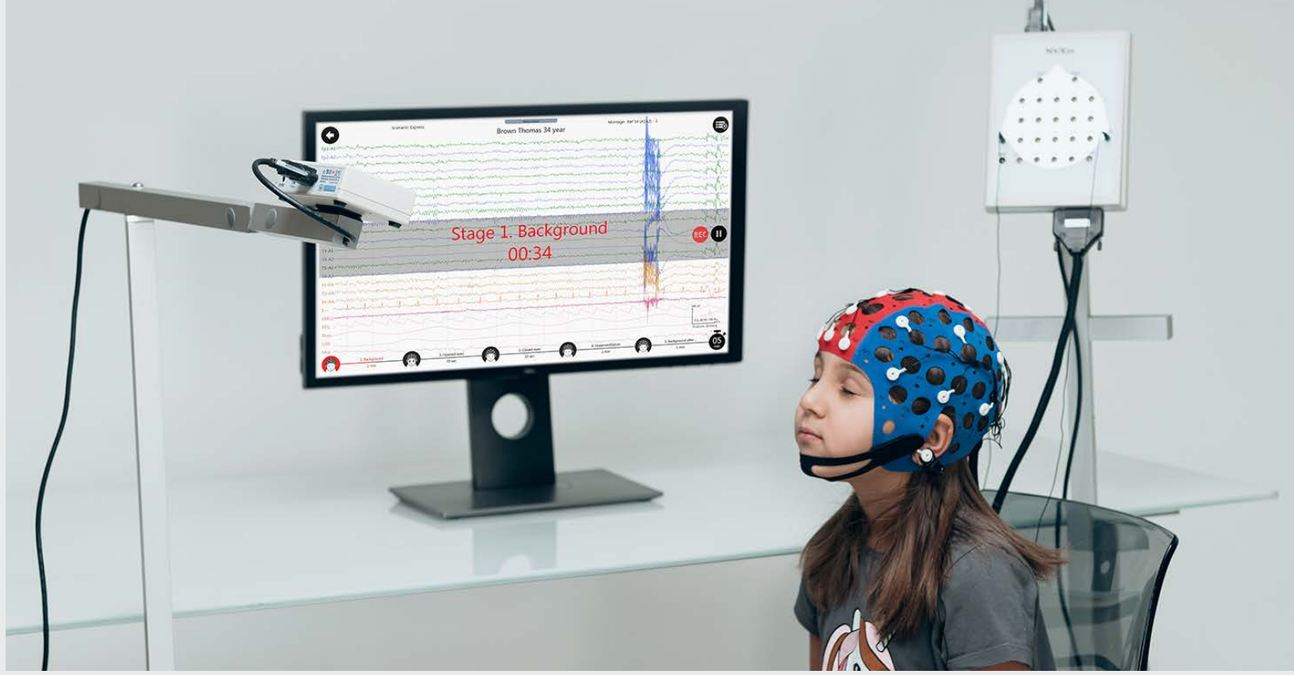
EEG maps in spectral bands



EEG spectrums for each lead



EEG signals, video frame, automatic conclusions



Digital DC EEG amplifiers

- full DC channels
- 24 bit resolution
- ±400 mV dynamic range of EEG channels
- 500 or 2000 Hz sampling rate for clinical EEG
- 2000, 10000 or 50000 Hz sampling rate for EP/ERP

Software advantages

- one button solution
- standard montages and examination scenarios according to IFCN guidelines
- automatic or semi-automatic examination procedure with voice prompts
- automatic artifact rejection using ICA method
- automatic generation of reports with manual editing capability

Quantitative EEG

- amplitude-frequency analysis of the main EEG rhythms
- spectral analysis (charts and maps)
- independent component analysis

Set includes

- EEG amplifier NVX with 5m USB cable
- photic stimulator with 5m USB cable
- EEG electrode cap MCScap
- 2 leads ECG cable with electrodes
- software license NEUROvisor
- plastic box, user manual

Options

- stand for amplifier
- stand for photic stimulator
- EP & ERP set*

Original probes for AUX channels*

- photoplethysmography finger probe
- 3D accelerometric probe
- breath thermometric probe
- galvanic skin response probe

* Intended for NVX36 and NVX52 amplifiers only

EP & ERP set

Evoked Potentials

Event-Related Potentials

EP & ERP set is intended for recording and analysis the potentials of the human brain, caused by the presentation of sound or visual stimuli.

EP & ERP is used by professionals in the neuroscience, cognitive psychology, cognitive sciences, and psychophysiological research. Module methods are well suited for studying the rate of neural activity.

In clinical research, EP & ERP is used to treat neurological conditions such as ADHD, dementia, Parkinson's disease, multiple sclerosis, head trauma, stroke obsessive-compulsive disorder, etc.





Video about EP & ERP

Lecture series on EP & ERP

EP & ERP set supports more than 60 different tests. Here are the most popular ones.

P300

ERP component elicited in the process of decision making

VN400

ERP component elicited to visual inclusion of meaningful words in sentence contexts

MATHEMATICS

test of brain's reaction in the process of solving mathematical tasks

ECPT

test to assess the ability to focus on constant activity

GONOGO

test of variation of decisions about spatial complexity or functional connectivity of visual objects by EEG

VCPT

test to assess the ability to focus on visual stimulus

VISUAL EP

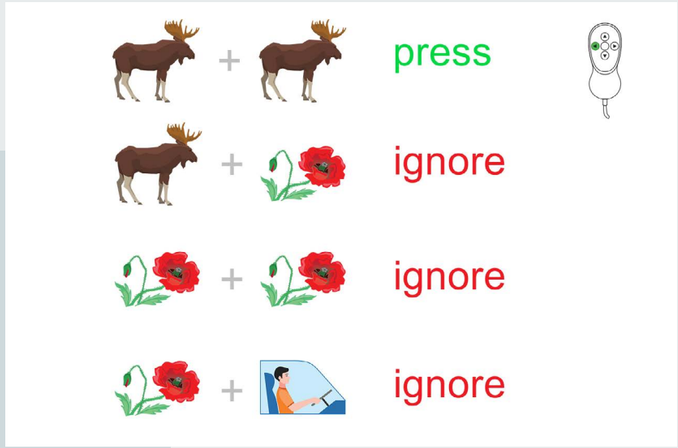
a flashing chessboard to detect damage or injury to the visual system

VCPT ERP

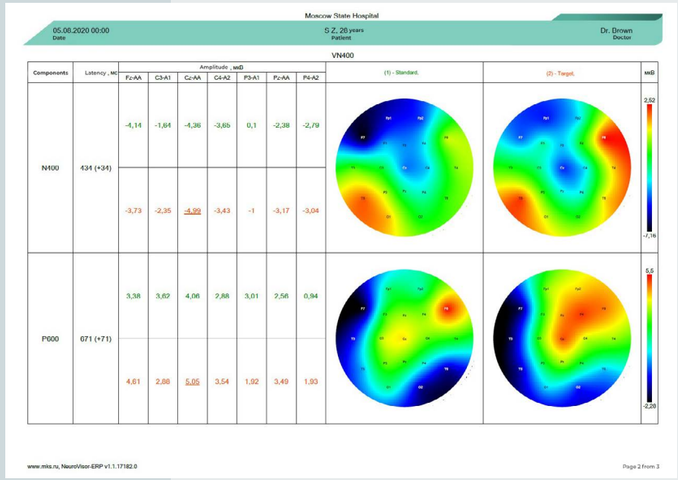
continuous performance test. Target and non-target stimuli appear on the screen in the form of cartoon images without letters and numbers

SOFTWARE

EP & ERP software



VCPT test



VN400 test

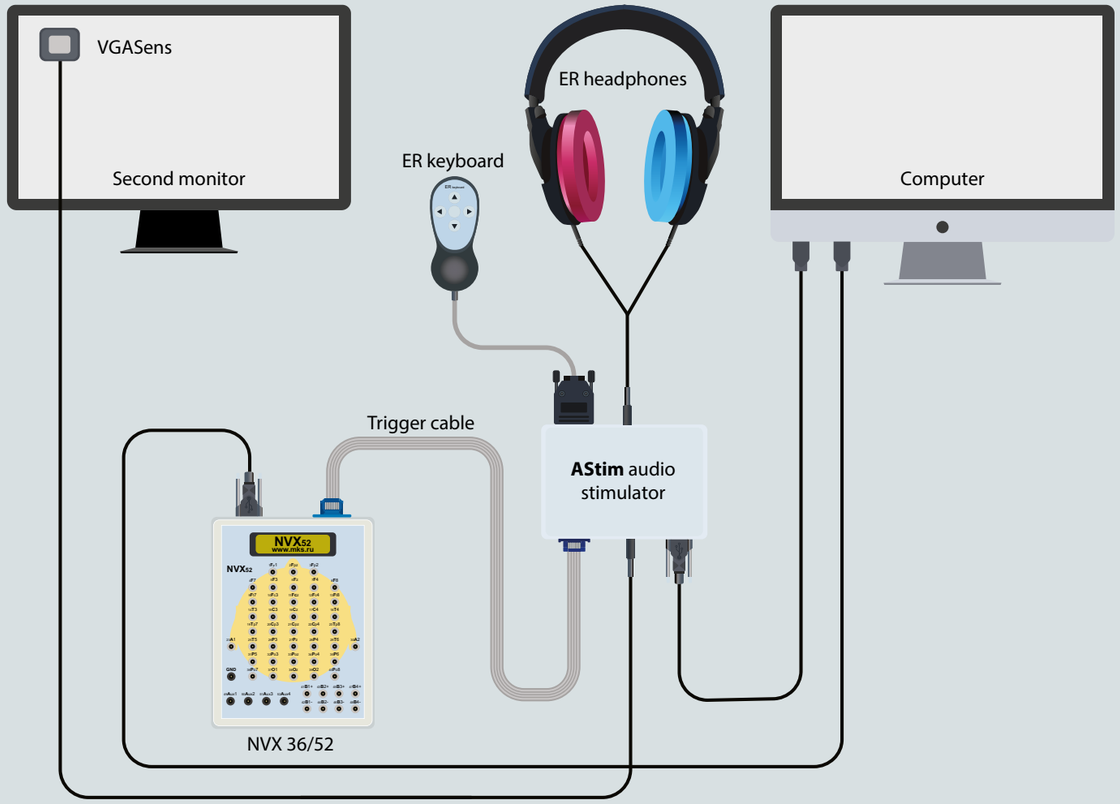


P300 test

EP & ERP set provides precise positioning of the stimulus label on the EEG when recording evoked potentials. Set is designed for use with EEG amplifiers NVX and NEUROvisor software, as well as with other amplifiers and software.

Set includes an audio stimulator with the ability to synchronize event marks, headphones, a keyboard for recording the response of the subject, and an optical sensor for synchronizing the presented visual stimuli.

EP & ERP set connection diagram



Set includes

- ASTIM acoustic stimulator with 5m USB cable
- ER headphones
- ER keyboard
- VGASens optical trigger sensor
- trigger cable for connection to EEG amplifier NVX
- software license EP & ERP
- plastic box, user manual

EP & ERP set is an optione to NEUROvisor clinical EEG system. EEG amplifier NVX 36 or NVX 52 is not included in the EP & ERP set.

PC with Windows 10 64 bit or higher is required for installation.

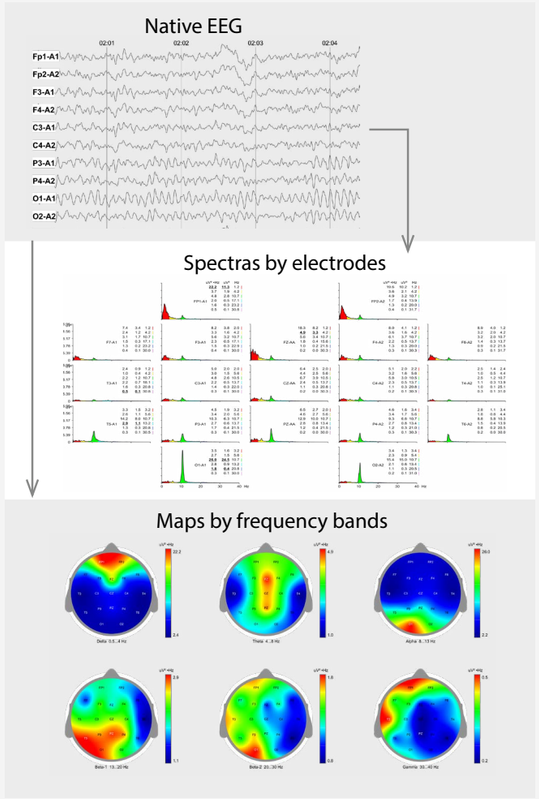
qEEG software

Quantitative EEG (qEEG) uses mathematical methods to analyze EEG data and derive functional markers of an individual's well-being. qEEG involves:

- measurements of an individual's brain activity,
- biomarkers of neurological, cognitive, and psychiatric impairments,
- personalized protocols for a customized biofeedback program.

Spectral and Spectral Amplitude Analysis

- Transforms EEG signals from voltage over time to power/energy or spectral amplitude across: delta (δ) 0.5 – 4 Hz, theta (θ) 4 – 8 Hz, alpha (α) 8 – 13 Hz, beta (β) 13 – 30 Hz, gamma (γ) 30 – 100 Hz).
- Computes scalp distribution of the resulting power or spectral amplitude values.
- Reflects spectral patterns associated with mood disorders and Alzheimer's disease dementia.



Delta/Alpha Ratio (DAR):

- Reflects post-stroke functional improvement.

Power Ratio Index (DTABR):

- An indicator of brain tumors.

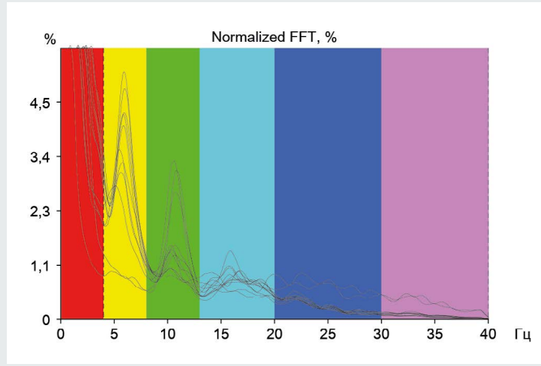
Brain Symmetry Index (pdBSI)

- An index of interhemispheric brain asymmetry.
- Reflects the recovery of motor functions after stroke; may serve a potential biomarker for earlystage Parkinson's disease.

Quantitative Electroencephalography for the Detection of Neuronal Disorders

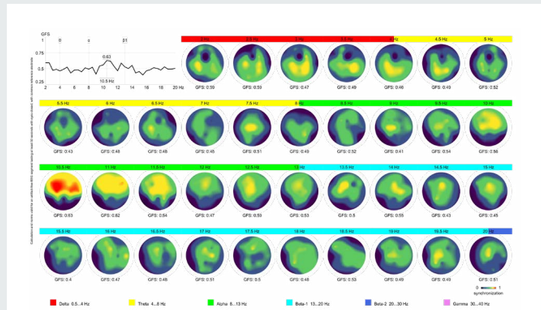
Spectral Categories ABCD

- Represent dominant oscillatory activity A – delta (< 4 Hz), B – theta (5–7 Hz), C – theta and beta (~15–40 Hz), D – alpha (~8–12 Hz) and beta.
- Predict brain recovery after severe brain injuries.



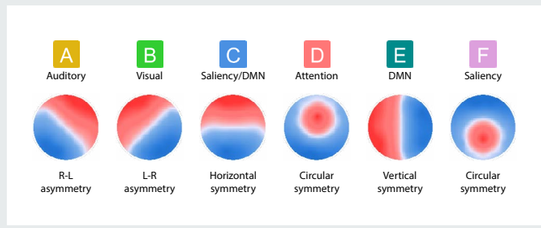
Global Field Synchronization (GFS)

- Quantifies large-scale phase synchronization in a specified frequency band.
- Maps GFS values over the scalp.
- Associated with cognitive deficits; reduced consciousness under anesthesia.



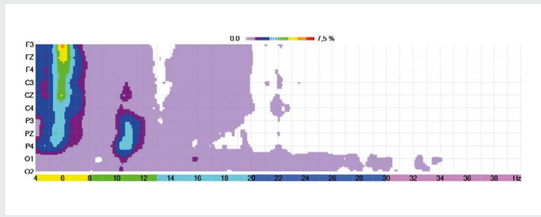
EEG Microstates

- Spontaneous scalp field configurations (80–120 ms) linked to functional brain states.
- Associated with schizophrenia, psychotic disorders, AD/MCI, attention disorders, ASD, and affective/ anxiety disorders.



DAFCAR

- Assesses the deviation of the alpha-rhythm from the normal distribution.
- Associated with mental and behavioral disorders (F00–F99) according to ICD10 classification.



Atlas of EEG alpha-rythm diagrams for diagnosis of mental disorders.
A summary analysis of 14,000 EEGs obtained during psychiatric examinations.
ICD-10 classification

NeoRec - 21 & 7/21 mini

Mobile DC EEG amplifiers

16 channels

21 channels

7 channels

Small & light



DC mobile EEG amplifiers NeoRec are designed to record EEG and other bioelectrical signals during scientific or medical research. Wireless data transfer to a PC in real-time via Bluetooth or with data recording to a built-in microSD card.

Advantages

- 7/21 DC EEG channels
- 24 bit resolution
- BLE wireless for PC and mobile application
- lightweight and small EEG amplifier
- quality Ag/AgCl sintered electrodes
- 12 sizes of textile caps
- wide range of EEG accessories MCScap

Intended for

- education
- research and development in EEG
- brain-computer interface
- bio-feedback
- neuromarketing
- neurogaming
- brain fitness

Specification

Model	NeoRec 21	NeoRec 21 mini	NeoRec 7 mini
DC EEG channels relative to GND	21		7
Dynamic range	±150, ±300 mV		
Resolution	24 bit		
Sampling rate	125, 250, 500, 1000 Hz		
Input impedance at DC	more 1 GOhm		
Self-noise @ 0.1-30Hz	2 µV p-p		
Impedance measurement	1 ..5000 kOhm (dry electrode check)		
Events	activity (4 steps), change orientation, free fall, button		
Offline data recording	yes, to microSD card		
Active electrodessupport	yes, with digital control		
Working time	20 hours	4 hours	20 hours
Wireless interface	BLE 5.2		
Wireless certification	CE, FCC USA, Canada, Japan, Korea, Taiwan		
Firmware update	wireless by mobile application		
Size	67 x 38 x 16 mm	33 x 23 x 18 mm	
Wight	40 g	14 g	
Software	NeoRec, NEUROvisor		

SDK / API for software development for PC and mobile applications is provided by request.

NeoRec cap 21

NeoRec cap 21 – EEG cap with 22 pre-installed Ag/AgCl sintered electrodes and 21-channel EEG amplifier with built-in accelerometer.

Set includes

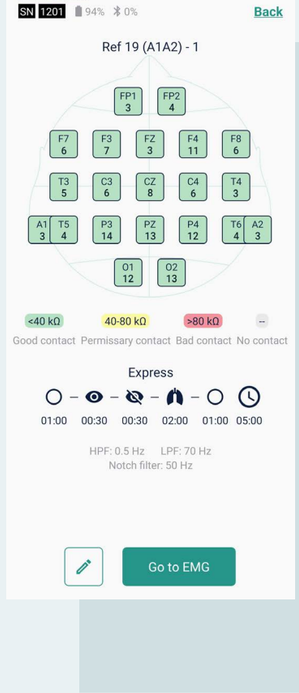
- EEG amplifier NeoRec 21
- electrode cap for NeoRec 21
- USB charging cable for NeoRec 21
- microSD card
- NeoRec chest strap
- user manual
- plastic box for storage
- NeoRec software

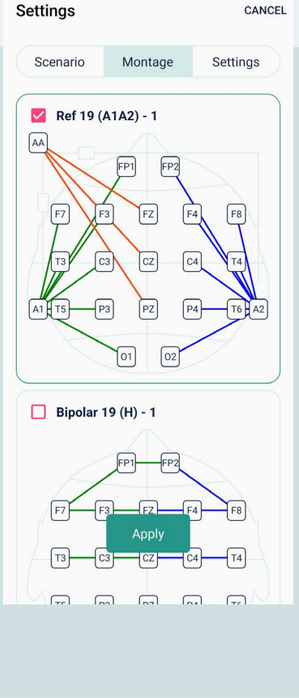


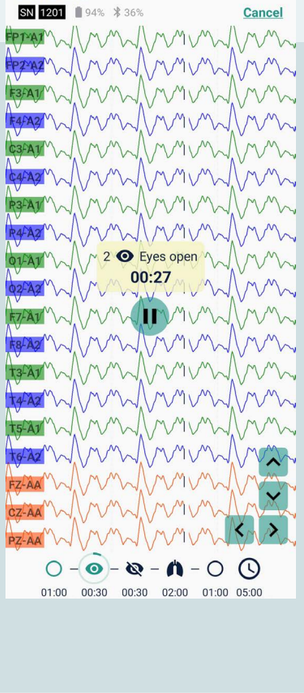
In NEUROvisor mobile version set will be included a specail clinical EEG software NEUROvisor.

NEUROvisor mobile software

Except NeoRec software for EEG acquisition, NeoRec 21 compatible with clinical EEG software NEUROvisor. NEUROvisor software is available at PC and as mobile application.



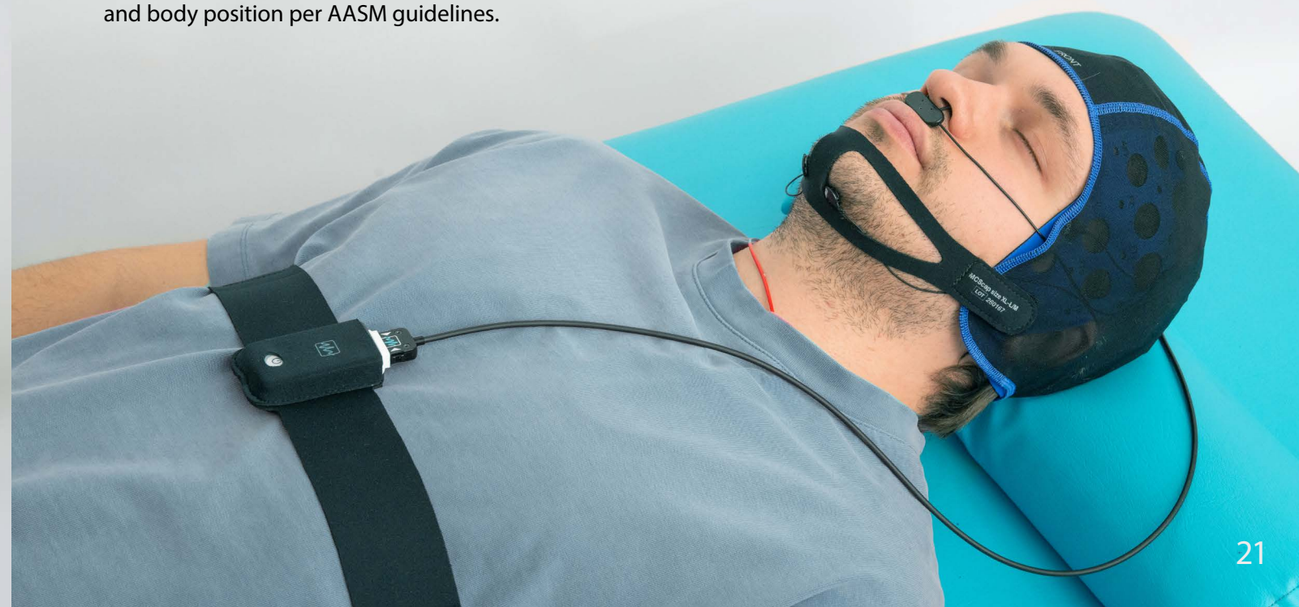




NeoRec cap 21 for polysomnography

EEG amplifier NeoRec 21 with Somnography electrode cap set and special software supports recording, processing, and reporting of PSG data – EEG, ECG, EOG, chin EMG, respiratory channels.

PSG reports provide statistics on sleep stages, respiration, heart rate, and body position per AASM guidelines.



SOFTWARE

NeoRec cap 7/21 mini



NeoRec cap 7/21 mini – EEG cap with 8/22 pre-installed Ag/AgCl sintered electrodes and 7/21 - channel EEG amplifier with built-in accelerometer.

NeoRec mini - probably the smallest EEG amplifier in the world. Weight in 14 grams is ok even for mice!



Set includes

- EEG amplifier NeoRec 7/21 mini
- electrode cap for NeoRec 7/21 mini
- USB charging station for NeoRec 7/21 mini
- microSD card
- user manual
- plastic box for storage
- NeoRec software



Electrode cap with DRY active or passive electrodes is available.

NeoRec RatEEG8

System for recording EEG, ECG, Respiration in laboratory rats.

New Opportunities for Preclinical Research in Neurophysiology, Toxicology, Neuropharmacology.



NeoRec RatEEG8 is a system designed to record 8 monopolar EEG channels, 1 bipolar ECG channel and 1 respiration channel in standard laboratory rats weighing around 300 grams.

The system consists of a miniature wireless amplifier, NeoRec mini, and a non-invasive hybrid Ag/AgCl electrode, RatEEG8. The electrode with the amplifier is attached to the rat's body using special chest vest, allowing the rat to move freely while physiological data is recorded during its normal activities.

Set includes

- NeoRec 21 mini EEG amplifier
- charging station and microSD card
- RatEEG8 hybrid electrode
- head strap - 6 pcs (L, M, S - 2 pcs each)
- chest vest - 9 pcs (all sizes)
- adhesive tape set - 10 pcs
- syringe with blunt needle
- plastic box for storage
- NeoRec software and user manual (download from the internet)



NVX – 72 / 136 / 272

Multichannel DC EEG amplifiers

MR-compatible

72 channels

136 channels

272 channels

MEDICAL COMPUTER SYSTEMS



EEG for researchers
up to 272 channels
MR-compatible

Video about
NVX – 136

Uncompromising device for EEG acquisition

NVX – 72/136/272 are designed for a medical-biologic researching in scientific and educational institutions.

Each channel has a direct current input and individual 24-bit analog-to-digital converter for measuring the EEG signal up to 100 thousand times per second.

Possible to extend up to 272 channels by connecting two amplifiers to the media converter, which gives a single clock frequency for all ADCs and ensuring synchronous channels conversion.

Software for planning of experiment and recording signals to EDF+ 16bit, BDF+ 24bit, GDF 32bit.

Set includes

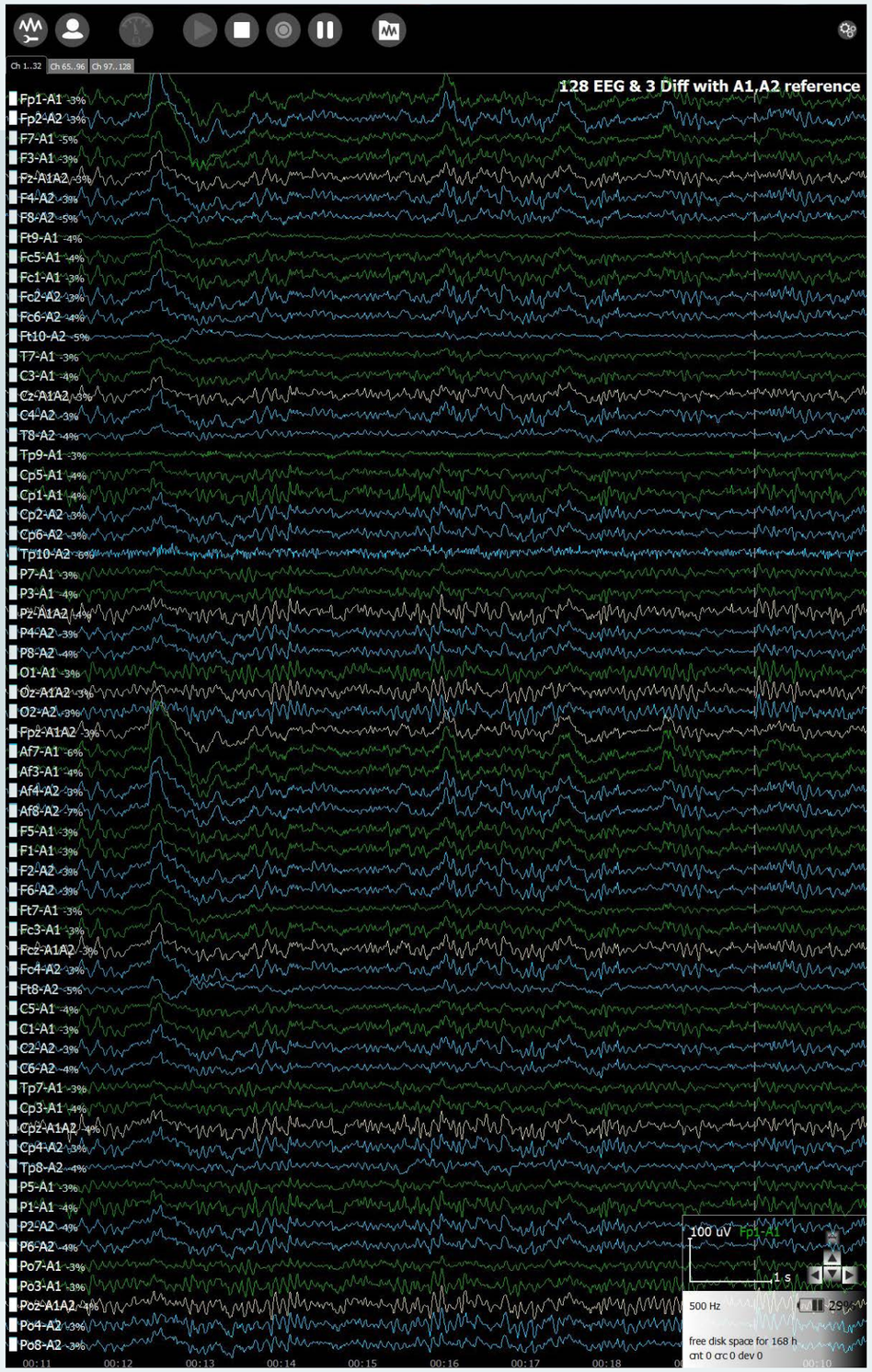
- NVX 72/136/272 DC EEG amplifier
- NVX 72/136/272 media converter
- NVX 72/136/272 battery module
- NVX 72/136/272 charger
- optical cable 1 m
- optical cable 10 m
- NVX 72/136/272 transport suitcase
- Electrode cap MCScap PROFESSIONAL 72/136/272 *

* For MR-compatible system - Electrode cap MCScap PROFESSIONAL MR 72/136/272.

NeoRec software



SOFTWARE



Specification of NVX 136

Number of DC EEG channels	136
Dynamic range	not less ±400 mV
Input impedance	more 1 GOhm @ DC / 30pF max
EEG channels noise	less 0.9 uVp-p @ 0,1..30 Hz
Voltage measurement error	less ±0.5%
DC channels of number, connected via AUX	8 monopolar (4 connectors x 2 channels) or 4 bipolar (4 connectors x 1 channels) set by application SW
Additional dynamic range for channels, connected via AUX	not less ±2000 mV, set by application SW
Analog-to-digital conversion	24 bit, 6th order delta-sigma modulator with 64x oversampling, one converter per each channel
Sampling rate of amplifier (high cut off frequency at -3dB)	For 64 EEG channels 100 000 Hz (16 000 Hz) For all channels: 50 000 Hz (16 000 Hz), 25 000 Hz (9 000 Hz), 10 000 Hz (4 900 Hz), 5 000 Hz (1 600 Hz), 2 000 Hz (650Hz), 1 000 Hz (300 Hz), 500 Hz (160 Hz), 250 Hz (80 Hz)
Low cutoff frequency at -3dB, set by application SW	set individually for each channel from a range of 0..100Hz or selected from the series 0, 0.001, 0.05, 0.1, 0.5, 1, 2, 5, 10 Hz
High cutoff frequency at -3dB, set by application SW	set individually for each channel from a range 5000..1 Hz or selected from the series 500, 300, 100, 70, 50, 30, 20, 10, 5, 1 Hz
TTL triggers input / output	8 / 8, not galvanically isolated from PC
Electrode impedance measurement range (absolute error)	1..120 kOhm (±10%), at 30 Hz
Test EEG signal	square wave 200 uV (±1%), 1 Hz
Input for external synchronization of ADCs	5..100 MHz, 50 Ohm sin / square wave
Aux sensor powering	5V, up to 100 mA for all sensors with electronic protection
Connecting amplifier – media converter	Optical plastic cable 10 m (option 20 m)
Connecting media converter – PC	USB V2.0 High-speed 480 MBod
Powering of amplifier	from accumulator module 6 V, 7A ·h; current consumption: less 1400 mA for sampling rates of 25 000..100 000Hz, less 500 mA for another sampling rates, less 3 mA in standby mode
Powering of media converter	from USB 5 V; less 400 mA in active mode, less 5 mA in standby mode
Sizes and weight of amplier	195x140x35 mm, 1200 gr.
Sizes and weight of accumulator module	195x140x48 mm, 2500 gr.
Sizes and weight of media converter	90x112x58 mm, 300 gr.

SDK for software development for PC applications is provided by request.

NVX – 36T

DC EEG amplifier with tES

36 channels

tDCS

tACS

tRNS



Video about
NVX – 36T

Research system for DC EEG acquisition and transcranial electrical stimulation (tDCs/tACs/tRNS).

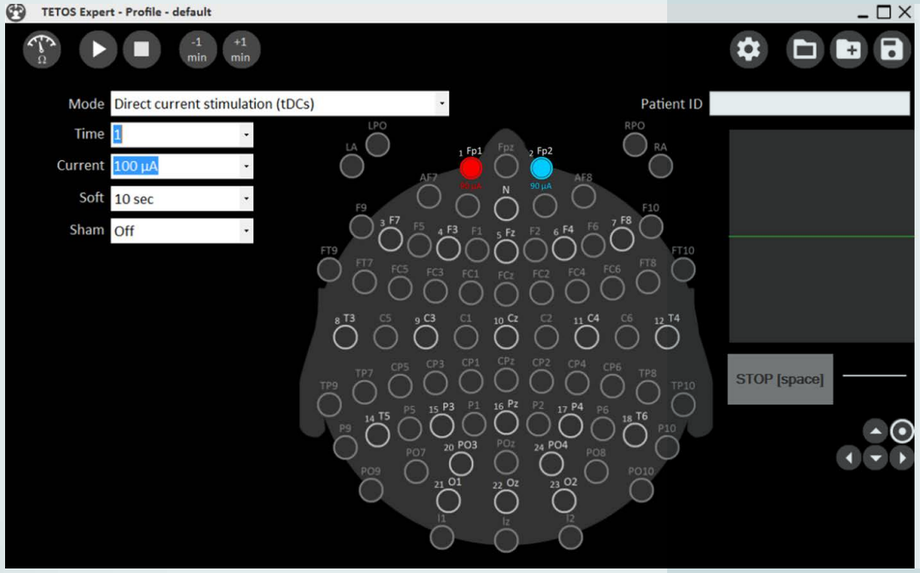
Advantages

- 32 EEG DC monopolar channels, 4 DC AUX bipolar channels for probes, 9/1 input/output triggers, OLED display, AC/DC DDS current generator. Stimulate using up to 31 electrodes.
- Dual use electrodes for EEG acquisition and stimulation. Used big-area sintered Ag/AgCl electrodes and innovative textile cap.

Flexible EEG acquisition and transcranial current stimulation

NVX-36T amplifier is used in training systems, clinical and scientific researches as a part of computer-based system. Each channel has a DIRECT CURRENT input cascade and individual 24-bit ADC for EEG sampling up to 10000 times per second. Internal high resolution Direct Digital Synthesis (DDS) current stimulator for producing DC or AC current via any EEG electrode or a set of electrodes.
Application software for settings of experiment, recording to EDF+, BDF+ and stimulation.
Software library for self-design of user application.

TETOS Expert software



Set includes

- NVX-36T DC EEG amplifier & tES stimulator (tDCs/tACs/tRNS)
- USB cable 5 m
- NVX-T EXPERT software (LSL server & tES)
- NeoRec software
- electrode kit
- stand for NVX amplifier (optional)

Specification

EEG recording mode	
EEG monopolar channels	32
Auxillary connectors for sensors;	4 galvanically isolated from EEG
TTL triggers (input / output)	9 / 1
Display	OLED; 3.2», 256 x 64 px
Dynamic range of EEG channels	not less than ± 400 mV
Input impedance of EEG channels	more 100 MOhm @ DC
Self-noise of EEG channels	< 1 µV p-p (0.15 RMS) @ 0.1-30 Hz
EEG test signal	square 250 µV (±1%), 1 Hz
Electrode impedance measurement range (absolute error)	1-120 kOhm (±10%) @ 30 Hz
Dynamic range of Aux channels	0-4 V
Input impedance of Aux channels	more 100 MOhm @ DC
Self-noise of Aux channels	< 15 µV pk-pk (2.5 µV RMS) @ 0.1-30 Hz
Powering of sensors	+5 V (±5%). up to 15 mA per channel with electronic protection
Digitalization	24 bit, 6th order delta-sigma modulator with 64x oversam pling, one converter per each channel
Low cutoff frequency	From 0 Hz (DC) followed by filtering by application software
Signal sampling frequency	500, 1000, 2000 Hz (TETOS Expert); 250, 500, 1000, 2000, 5000, 10000 Hz (NeoRec); 250-2000 Hz for all channels: 5000 Hz for the first 24 channels; 10000 Hz for the first 16 channels;
Real time data transmission protocol	Lab Steaming Layer (LSL)
Stimulation mode	
Number of current generators	1
Number of stimulation channels	up to 31 (30 EEG + GND, switching to channels A1 and A2 is not available), each electrode can be connected to the anode or cathode of the generator
Current generator	16 bit Direct Digital Synthesis (DDS)
Stimulating range	from 10 µA to 3.9 mA
Maximum output voltage of the current generator	30 V
Stimulation current modes	Direct current (tDCS), Alternating current (tACS), Alternating current monopolar (tACMS), Random noise (tRNS), Custom stimulation mode
Stage duration	up to 60 min
Smooth start/end of stimulation	Off, 10, 20, 30 sec
Sham stimulation	Off, 10 / 20 / 30 sec. at the beginning, 10 / 20 / 30 sec. at the beginning and at the end
Stimulus shapes in tACs and tACMs mode	Sine, square, random noise, ramp, trap, sinc, Gauss, Lorentz, haversine, exponential, custom
Loading an external stimulus	from a specially prepared WAV file
Current generator sampling rate	8000 Hz
Maximum frequency for a periodic signal	1000 Hz
Measurements during stimulation	Total generator current; Total load impedance; Local current for each electrode (for all electrodes in AC mode, for the anode in DC mode)
Stimulation indication	In the program, sound signal, light indicator, output trigger, on the LED screen of the device
Other	
Connector for electrode cap	TouchProof 1.5 mm (DIN 42 802-BU) for individual electrodes DB-25F (24 channels) KEL 8830E-040 (32 channels)
Control	USB only
PC interface	USB, V1.1, 2.0, 3.0 type B, Plug And Play
Cable length	5 m
OS	Windows 10 (64 bit)
Power	5 V, 450 mA max from USB in active mode, current consump tion up to 450 mA, in standby mode up to 5 mA
Time of continuous work	not less than 8 hours
Average lifetime	5 years
Dimensions (LxWxH)	200 x 155 x 40 mm
Net weight	< 650 g
Safety	IEC60601-1, IEC60601-1-6, IEC60601-2-10, IEC60601-2-26 class II, type BF

Electrode kit includes

- Ag/AgCl sintered electrodes MCScap-NTC – 33 pcs.
- Ag/AgCl electrodes MCScap-CS22 – 33 pcs.
- Stainless steel electrodes MCScap-CS22SS – 33 pcs.
- Set of ear Ag/AgCl sintered electrodes with fixators – 2 pcs.
- Textile cap MCScap 10-10, size L (54-60 cm) – 2 pcs.
- Textile cap MCScap 10-10, size M (48-54 cm) – 2 pcs.
- Textile cap MCScap 10-10, size S (42-48 cm) – 2 pcs.
- Elastic textile belt, size L (54-60 cm) – 2 pcs.
- Elastic textile belt, size S (42-48 cm) – 2 pcs.
- Starter kit (conductive gel, syringe, needles, brushes for cleaning).



tES4me

Mobile tES device

8 electrodes

tDCS

tACS

tRNS



Video about
tES4me

tES4me is a personal system for transcranial electrical stimulation intended for physiotherapy and rehabilitation of patients with neurological and psychiatric diseases by means of transcranial electrical stimulation (tES) in accordance with stimulation protocol prescribed by the attending physician.

Weak constant or pulsating electrical stimuli from surface electrodes are delivered to the brain during tES procedure. It is known that properly selected tES procedure improves the quality of life and corrects such clinical conditions as anxiety, depression, insomnia, addiction and can also be used to create a state similar to chemically induced anesthesia.

tES4me can be used by the patient independently at home after preliminary programming of the personal stimulator by the doctor.

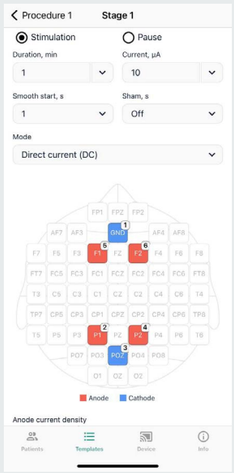
Advantages

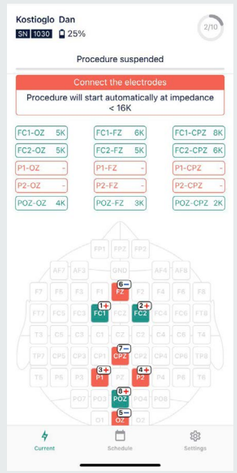
- Programming scenarios up 30 unique procedure, up to 5 stages in the procedure.
- From 2 up to 8 electrodes can be connected to current generator poles in arbitrary order.
- Individual tES modes for each stage: tDCS, toDCS, tACS, tPCS, tRNS, HD-tES. Sham stimulation.
- Current generation with direct digital synthesis (DDS) up to 4 mA.
- Precise current adjustment 1 µA.
- Smooth increasing and decline of stimulation current.
- Continuous impedance measurement during TES procedure.
- Simple device operation – one button solution.

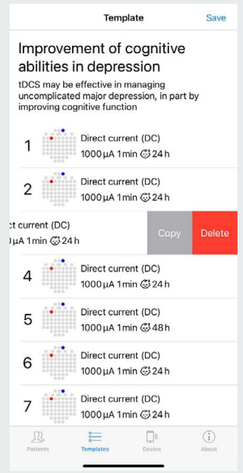
tES4me software

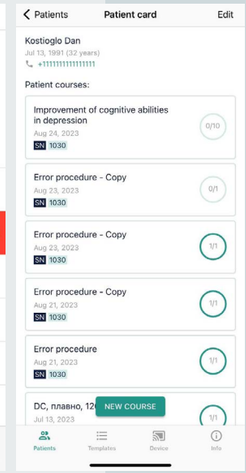
tES4me for Doctor allows creating and recording stimulation courses, using built-in or custom templates, storing user data, and synchronizing session history with the stimulator.

tES4me for Patient displays the current device status, schedule, and session history, monitors electrode connection quality (impedance), shows the progress of the procedure, and enables self-assessment after stimulation.









Offline operation by pre-configured and loaded protocol into the internal memory of the device.

SOFTWARE

Specification

Number of procedures in the course / stages in the procedure	1-30 / 1-5
Duration of the procedure / stage	1-60 min.
Setting of minimum rest time after the procedure. Device is blocked during this time	0, 1, 6, 12, 24, 48, 72 hours
Smooth rise and fall of stimulation current	Off, 10, 20, 30 sec.
Stimulation current	10-4 000 µA
tES modes	tDCS - Transcranial direct current stimulation, toDCS - Transcranial oscillatory direct current stimulation, tACS - Transcranial alternating current stimulation, tPCS - Transcranial pulsed current stimulation, tRNS - Transcranial random noise stimulation, HD-tES - High density transcranial electrical stimulation, Sham stimulation
Maximum allowable impedance for maximum stimulation current/generator voltage	9.5 kΩ /38 V
DDS generator sampling frequency/digit capacity	8 kHz / 13 bit
Checking of the electrode connection before stimulation	Impedance less 8 kΩ @ 30 Hz, measurement current 30 µA
Shape (for tACS and toDCS modes)	Sine, Random, Square, Ramp, Trap, Sin(X)/X, Gauss
Frequency (for tACS and toDCS modes)	1-1 000 Hz
Lower cutoff frequency for tRNS mode @-3dB	10 Hz, 50 Hz, 100 Hz, 200 Hz, 300 Hz, 500 Hz
Upper cutoff frequency for tRNS mode @-3dB	50 Hz, 100 Hz, 200 Hz, 300 Hz, 500 Hz,1000 Hz
Wireless interface	BLE 4.2
Wireless certification	CE, FCC USA, Canada, Japan, Korea, Taiwan
Battery charging	2.5 hours from USB 5V ⎓ 2A(max)
Dimensions (LxWxH)	87 x 56 x 17 mm
Net weight	65 g
Operation system	iOS, Android, Windows
Main functions of the doctor application	Programming of stimulation courses and course templates, uploading of protocols and condition assessments, operation with a patient database
Main functions of the patient application	Schedule of procedures with mark after completion, assessment of the state after procedure (1-5 points), indication of stimulation process
Diameter / surface area of electrode CS22SS	22 mm / 3.80 cm^2
Diameter / surface area of electrode CS13SS	13 mm / 1.32 cm^2

Reusable sponges

Absorb fluid instantly and retain it for a long time.





tVNS

Special ear electrode for transcutaneous vagus nerve stimulation (tVNS).

Set includes

- tES4me electrical stimulator
- MCScap-CS22SS electrodes – 8 pcs.
- D22 reusable sponges – 10 pcs.
- lead cable
- tVNS ear clip
- tVNS belt
- tVNS adapter
- MCScap textile cap
- MCScap COVER protective cap
- irrigation syringe
- USB charging cable for tES4me
- user manual
- plastic box for storage



EMGsens

Wireless EMG sensor



Video about
EMGsens

EMGsens - one-channel extremal lightweight wireless sensor for surface electromyography and moving control.

Sensor is intended use for acquisition of EMG and 3D acceleration events and transfer it to PC or mobile device.

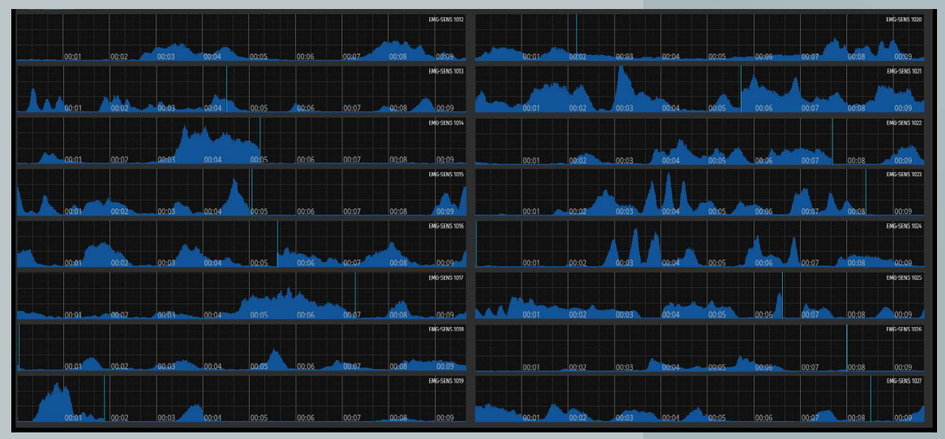
EMGsens can be used for education, research and development in EMG, brain-computer interface, rehabilitation, biofeedback, neuromarketing, neurogaming.

Advantages

- 6 grams
- fixations directly to skin by disposable double sided strap tape with different adhesives
- native EMG up to 5 kHz sampling rate or envelope EMG
- 3D accelerometer and smart event
- in-build electrodes or external disposable standard electrodes
- BLE wireless for PC and mobile application



SDK for software development for PC and mobile applications is provided by the manufacturer upon request.



Up to 18 sensors EMGsens can be integrated in the system of simultaneous registration of EMG.

SOFTWARE

EEG accessories MCScap

Ready electrode caps

Ag/AgCl electrodes

Textile caps

Adapters





EEG electrode caps

MCScap is modern high-technology caps for EEG.

- quality of EEG signal acquisition
- comfortable for patient
- easy and fast installation
- convenience for doctor/operator
- long durability

Ready solutions for different EEG examinations.

- routine EEG
- long-term EEG monitoring
- neonatal EEG
- TMS - EEG
- high-resolution EEG
- EEG in scientific research
- MRI-compatible EEG

Custom orders

Electrode cap can be customized according to your amplifier and needs:

- Different type of electrodes – more than 10 types.
- Different arrangement and quantity of electrodes - up to 256 pcs.
- Different connectors – single connectors Touchproof, common connectors DB25, DB37, KEL, MDR and other connectors, with different pin layout.

Video about MCScap

Shop mcscap.com

Textile caps for EEG electrodes



Elastic material provides the most comfortable fit of the electrodes and the right positions without additional adjustment.
The material does not allow the gel or paste to dry out under electrodes fast.

Marked holes for electrodes by international systems 10-20, 10-10 or 10-5.

Big holes for the opportunity to push the hair and prepare the skin for examination.
12 sizes for heads from 24 cm up to 66 cm circumference. Color material or color seams helps to make a quick choose of the right size.

Size	Head circumference	Colored /Black cap Size is identified by textile / seam color	Chin / chest belt size	Recommended for *
XL	60-66 cm	Green	Adult	Adults
XL/L	57-63 cm	Green + blue		Adults
L	54-60 cm	Blue		Adults (most)
L/M	51-57 cm	Blue + red		Teenagers, adults
M	48-54 cm	Red	Children	Children, teenagers
M/S	45-51 cm	Red + yellow		Children up to 5 years
S	42-48 cm	Yellow		Children up to 2 years
S/XS	39-45 cm	Yellow + green		Children up to 1 year
XS	36-42 cm	Green	Infants	Babies up to 4 months
Inf I	32-36 cm	Blue		Infants up to 1st month
Inf II	28-32 cm	Red		Newborns, premature baby
Inf III	24-28 cm	Yellow		Newborns, premature baby

EEG electrodes

A wide selection of EEG electrodes in various shapes for different tasks. Electrodes can have TouchProof connectors or can be preinstalled in the electrode cap with common connector.

Reusable passive electrodes MCScap are based on high-quality Ag/AgCl sensors which guarantee:

- a long-term stable electrical contact,
- a low electrode noise,
- a minimum electrode polarization,
- an excellent low frequency response.







MCScap-E
Ag/AgCl sintered



MCScap-NTC
Ag/AgCl sintered



MCScap-NT
Ag/AgCl sintered



MCScap-StNT
Ag/AgCl sintered



MCScap-NTH
Ag/AgCl sintered

MCScap-T
Ag/AgCl sintered



MCScap-C
Ag/AgCl covered



MCScap-TC
Ag/AgCl covered



MCScap-StTC
Ag/AgCl covered



MCScap-T-HD
Ag/AgCl sintered



Dry electrodes for EEG



EEG electrodes are produced in 2 types:

- dry active electrode MCScap-DrA1
- dry passive electrode MCScap-DrP1

MCScap-DrA1 is polyurethan hermetic body with PCB of amplifier and thin and durable cable.

Amplifier use for converting high input impedance from dry sensor to low output impedance.

This solution dramatically decreases moving cable noise and external interference to cable.

Dry EEG electrodes can be used with soft dry sensors SoftPulse™ produced by Datwyler:

- flat and Dome (for skin without hair and ears),
- brush Medium (universal),
- flex (universal, recommended).

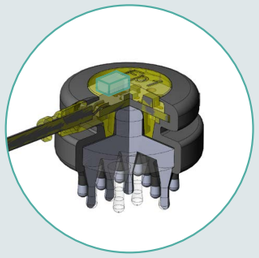
Comparison of EEG Electrodes: Wet, Dry Active, Dry Passive



Electrodes MCScap-DrA1 and MCScap-DrP1 can be preinstalled in MCScap DRY electrode cap with common connector.

Cap can have different quantity of electrodes and different types of connectors, according to requirements of EEG amplifier model and aims of application.

How it works?



Initially Dry electrodes work worse than liquid or solid gel electrodes.

This is due to the resistance of the electrode-skin, on which interference is emitted:

- 5 - 60 kOhm for electrodes with liquid or solid gel,
- 200 -1000 kOhm for dry electrodes.

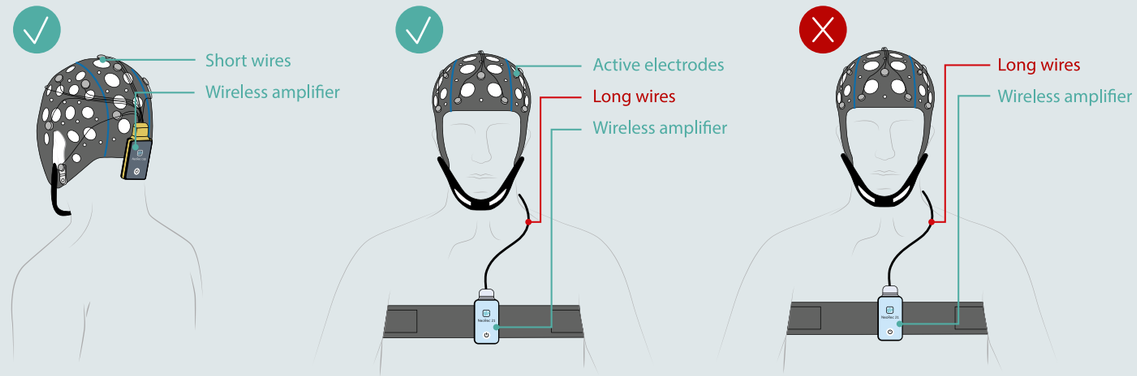
Therefore, for dry passive electrodes is recommended to use wireless amplifiers with short elctrode cables (up to 30 cm), which is placed at patient head. For an acceptable result, the EEG is filtered, leaving the signal in a band of approximately 1 .. 30 Hz.

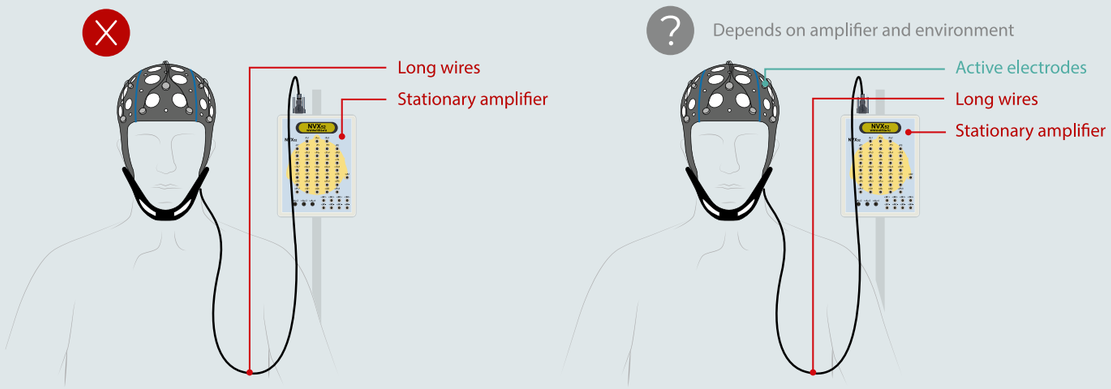
Active dry electrodes can work with long wires effectively. The builted amplifier into the electrode reduces the output impedance from the electrode and significantly attenuates the noise induced on the wires.
But active electrodes are more complex, require additional power and are more expensive than conventional passive electrodes.

Working combination with dry electrodes

Positive factor

Negative factor





DEC NET

Disposable EEG cap



Video about
DEC NET

Advantages

- Ag/AgCl electrodes provide high-quality stable signal.
- 23 electrodes are alredy pre-installed according to the 10-20 system.
- Perfect solution for EEG+TMS due to ultra-thin electrodes.
- Suitable for long-term EEG monitoring up to 72 hours.
- Single-use product - 100% solution to cross-contamination problems.
- Saves medical staff time on cleaning, drying and disinfecting.
- Simple and quick mounting - less than 5 minutes.
- Lightweight and comfortable for patients.
- Sizes: L, M, S, XS, Inf.





Connection of the cap to EEG amplier
via reusable adapter with DB25
or touchproof connectors.

Custom orders

Disposable EEG caps and adapters can be designed and manufactured on order, according to specific customer needs or requirements.

The cap design, number of electrodes, adapter connector type and other parameters may vary.

For example - a disposable cap with pre-applied gel electrodes or a disposable cap with reduced number of electrodes for infants.



ICE & FACE grid





ICEGrid

ICEGrid ear-worn EEG arrays are designed for long-term, comfortable monitoring of electroencephalographic (EEG) brain activity primarily in the temporal lobe. They are recommended as an adjunctive tool for diagnosis and monitoring of epilepsy, including the detection of focal seizures and interictal epileptiform discharges (spikes) during prolonged (up to 24/7) EEG monitoring.

FACEGrid

FACEGrid is suitable for long-term EEG monitoring, epilepsy care, postoperative eye muscle recovery. FACEGrid supports home-based applications such as migraine screening, sleep tracking, and depression management. In emergency medical care, FACEGrid can serve as an additional tool for detecting epileptiform discharges in patients with impaired consciousness.



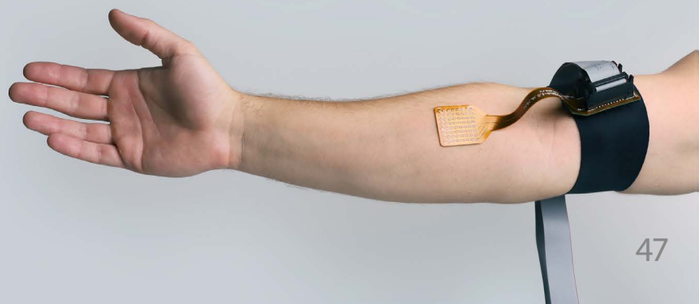
EMG matrix dEMG



Specification

Number of electrodes	64 (8x8) or 32 (8x4)
Electrode sensor material	Ag/AgCl
Surface diameter of single electrode	2 mm
Center-to-center distance	4.0 mm or 8.5 mm
Method of attachment to the patient's skin	using a double-sided adhesive fastener and elastic neoprene tape
Interface cable length	1 m
Socket for connection to EEG amplifier	KEL40
Compatible with EEG amplifiers	NVX72, NVX136, NVX272, achiCHamp Plus. Compatible with other EEG amplifiers using a special adapter

High-density multi-channel matrix dEMG is designed to record up to 64 channels of surface EMG during scientific research.



NeoSens

Biomedical sensors for recording various biological signals



NeoSens are designed for connection to biological signal amplifiers and used to record physiological parameters in scientific research and clinical practice.

Sensors are compatible with amplifiers:
KARDi2-NP / FirstAmp / Vamp / NVX-36 / NVX-52 and other amplifiers via adapetrs or connecor customisation.



VGAsens

VGAsens is a discrete photometric sensor designed to detect light flashes on a screen and synchronize video stimuli with biosignal streams. It features a digital TTL-compatible open-collector output and an adjustable sensitivity threshold.

AXsens

AXsens is a single-axis accelerometer with adjustable sensitivity and manual axis selection using switches on the front panel. Only one axis can be recorded at a time.

RESPsens-MRI

RESPsens-MRI is a chest-worn respiratory sensor compatible with MRI. Includes a membrane sensor and a pressure-to-voltage converter.

FPsens

FPsens is a sensor for detecting the absorption of infrared radiation in living tissues, designed for non-invasive transcutaneous monitoring. The time-dependent signal is generated by changes in peripheral blood volume due to pulsatile blood flow.

IMPsens

IMPsens is a sensor with impedance cardiography (ICG) and electrocardiography (ECG) channels. The ICG channel allows extraction of baseline impedance, respiratory waveform, rheocardiogram, and ECG signal.

DNsens

A hand muscle strength measurement sensor with palm length adjustment.

EMG2AUX

Differential amplifier for EMG with set of cables NeoSens-compatible.

AXsens-3D

AXsens-3D is a three-axis accelerometer with adjustable sensitivity and separate outputs for each axis. It allows simultaneous recording of one, two, or all three axes, depending on the number of channels connected.

GSRsens

GSRsens is a sensor for monitoring galvanic skin response (GSR), converting skin conductance into electrical voltage.

TRsens

TRsens is a nasal-oral respiratory temperature sensor based on high-sensitivity thermistors.

ABsens

ABsens — an abdominal respiratory sensor based on piezoelectric technology. A wireless solution for neonatal monitoring.

SHOOTsens

SHOOTsens is an acoustic sensor for detecting sound markers. It consists of an amplifier unit and a cable for connection to an amplifier.

Event button EvButton

A button for receiving feedback from the subject during psychophysiological experiments.

Custom sensor

Custom design and manufacturing of sensors.

TEST equipment

Signal generator NeuroTest

Portable simulator of electrophysiological and test signals.





Specification

The direct digital synthesis method allows you to obtain the following signals:

- harmonic (sine) 0.5 - 99 Hz,
- square wave 0.5 - 99 Hz,
- normal PQRST complex in lead II with a repetition period from 0.5 to 1.6 Hz,
- to test T-wave suppression according to IEC 60601-2-27; from 30 to 300 per minute,
- to test the heart rate detector according to IEC 60601-2-27; from 30 to 300 per minute,
- ventricular fibrillation simulation - AHA DB 8201,
- amplitude ±1.25 V, ±0.63 or ±0.31V, error of no more than ±1.2%,
- frequency error no more than ±0.2%,
- TTL sync output,
- automatic shutdown function,
- at least 100 hours of operation from a 1.5 V element (AAA).

NeuroTest is designed to used together with different adapters (passive dividers).



Adapters for testing of EEG devices



FC-UNI

Universal passive divider for testing bioelectric signal recording devices with touchproof connectors.



FC-NVX3

Passive divider for testing EEG amplifiers: NVX-24/36, NeoRec 21, NeoRec 21 mini, other amplifiers with compatible connectors and pinouts.



FC-NVX2

Passive divider for calibration and testing of the EEG amplifiers: NVX-24/36/52; NVX36T, NVX-72/136/272, actiCHamp Plus, other amplifiers with compatible connectors and pinouts.

Adapters for testing of ECG devices



FC-12C-1

Passive divider for testing and calibration of ECG amplifiers.



KARDi2FC-UNI

Passive divider with a selection of division ratio for testing ECG amplifiers.

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Brochure