



NVX36T

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

Advantage

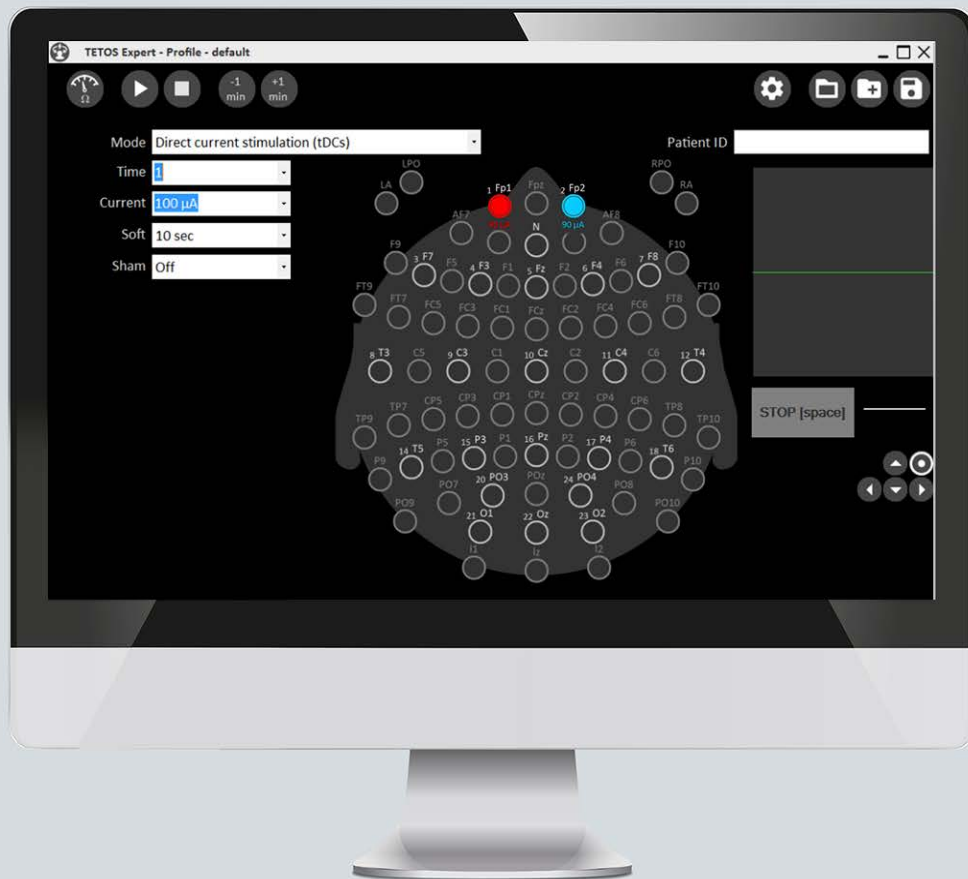
- 32 EEG DC monopolar channels, 4 DC AUX bipolar channels for probes, 9/1 input/output triggers, OLED display, AC/DC DDS current generator. Simulate using up to 31 electrodes.
- Dual use electrodes for EEG acquisition and stimulation. Used big-area sintered Ag/AgCl electrodes and innovative textile cap.

Flexible EEG acquisition and transcranial current stimulation

NVX-T 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 2000 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's application.



Specification

| | |
|---|---|
| EEG recording mode | |
| EEG monopolar channels | 32 |
| Auxillary connectors for sensors; | 4 galvanic isolated from EEG |
| TTL triggers (input / output) | 9 / 1 |
| Display | OLED; 3.2», 256 x 64 px |
| Dynamic range of EEG | not less then ± 400 mV |
| Input impedance of EEG channels | more 20 MOhm @ DC |
| Input noise of EEG channels | $< 1 \mu\text{V}$ pk-pk (0.17 RMS) @ 0.1-30 Hz |
| EEG test signal | square 250 μV ($\pm 1\%$), 1 Hz |
| Electrode impedance measurement range (absolute error) | 1-120 kOm ($\pm 10\%$) @ 30 Hz |
| Dynamic range of EEG | 0-4 V |
| Input dynamic range of signal of sensor channels connected via AUX connectors | > 100 MOhm @ DC |
| Input noise of bipolar sensors channels | $< 15 \mu\text{V}$ pk-pk (2.5 μV RMS) @ 0.5-30 Hz |
| Powering of sensors | +5 V ($\pm 5\%$). up to 15 mA per channel with electronic protection |
| Digitalization | 24 bit, 6th order delta-sigma modulator with 64x oversampling, one converter per each channel |
| Low pass filter | 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 format | Lab Streaming Layer (LSL) |
| Stimulation mode | |
| Number of current generators | 1 |
| Number of stimulation channels | up to 31 (30 ЭЭГ + 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 current 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 | 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, indicator light, 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 | not less then 4.5 m |
| OS | Windows 10 (64 bit) |
| Power | 5 V, 450 mA max from USB in active mode, current consumption up to 450 mA, in standby mode up to 5 mA |
| Time of continuous work | not less than 8 hours |
| Average lifetime | 5 years |
| Resistance to mechanical stress | group 2 according to GOST RF 50444-92 |
| 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 |

Wide range of MCScap accessories
for EEG and tES



System include:

- 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).

Electrode kit include:

- 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 pc.
- Textile cap MCScap 10-10, size M (48-54 cm) – 2pc.
- Textile cap MCScap 10-10, size S (42-48 cm) – 2 pc.
- Elastic textile belt, size L (54-60 cm) – 2 pc.
- Elastic textile belt, size S (42-48 cm) – 2 pc.
- Starter kit (conductive gel, syringe, needles, brushes for cleaning)

MCScap-CSS22/NT/NTC - Ag/AgCl electrodes for EEG acquisition and tES, mainly by alternating current stimulation - tACS

MCScap-CS22SS - stainless steel electrodes for tES by both direct and alternating current stimulations - tDCS and tACS

