

# Neurobit Optima™ 4 / 2



*Portable equipment for neurofeedback, biofeedback & physiological data acquisition*

## Highlights

- 4 versatile, low-noise channels enabling measurements of voltage, conductance, resistance and temperature signals. (NO-2 model has 2 channels.)
- function of each channel is specified by a user (e.g. 4 x EEG, or EEG + EMG + GSR + TEMP, or 2 x EEG + 2 x EMG etc.)
- built-in test of electrode-skin impedances and input circuit continuity,
- independent reference inputs for each channel,
- 16-bit resolution of measurements,
- 1% accuracy of voltage measurements,
- output sample rate up to 2000 sps,
- oversampling (primary sampling rate up to 8000 sps),
- selectable frequency characteristics enable to minimize signal delay or maximize frequency bandwidth,
- high immunity to electrical interferences,
- option of active shielding of sensor cables to reduce movement artifacts,
- configurable filter of power mains interferences (50/60 Hz or off),
- full galvanic isolation of the subject's body,
- wireless connection to a computer,
- interoperation with many computer applications making possible flexible signal processing and visualization (also in real time), as well as storage in a computer,
- application programming interface (API),
- device extension with digital signal processor (DSP) executing client-defined algorithms (custom-made option),
- 2 AA battery powered,
- long work without battery replacement,
- indicators of battery, wireless link and measurement input states,
- small size and weight,
- belt clip enabling to wear the unit,
- remote firmware upgrade,
- CE mark.



REMARK: The equipment is not a medical product.

## Technical data

Number of versatile measurement channels 4 (NO-4 model) or 2 (NO-2 model)

Resolution of ADC conversion 16 bits

Measurement capability:

Measured quantity	Application (measured signals)	Measurement ranges	Digital resolution	Measurement accuracy
Voltage	EEG, sEMG, HRV, EOG, ENG etc.	1000 $\mu$ V 8 mV	0.031 $\mu$ V 0.244 $\mu$ V	1 %
Resistance	Resistive sensors of non-electrical quantities	125 k $\Omega$ 1 M $\Omega$	0.004 k $\Omega$ 0.030 k $\Omega$	1 %
Conductivity	GSR (EDA) etc.	1..20 $\mu$ S ( $\mu$ mho) 8..160 $\mu$ S ( $\mu$ mho)	0.0006 $\mu$ S ( $\mu$ mho) 0.005 $\mu$ S ( $\mu$ mho)	
Temperature	TEMP	-18..120 $^{\circ}$ C	0.0037 $^{\circ}$ C	0.2 $^{\circ}$ C (from 0 to 70 $^{\circ}$ C)

Measurement sockets

Touch-Proof 1.5mm (DIN 42802)

Output sample rate  
(set independently for each channel)

2000 | 1000 | 500 | 250 | 125 | 62.5 samples per sec. (15.625 for non-voltage measurements)

Maximum total sample stream

5000 samples per sec.

Passband:

- lower corner frequency (-3dB) 0.3 Hz
- upper corner frequency (-3dB) up to 800 Hz (40% of the output sample rate)

Common mode rejection ratio (CMRR)

$\geq$ 130 dB

Differential input impedance

100 G $\Omega$  typ. (DC)

Equivalent input noise  
(EEG profile, 0.3..45 Hz band)

0.15  $\mu$ Vrms (1  $\mu$ Vpp)

Wireless data transmission

Bluetooth (2.4 GHz)

Wireless link range

10 m

Power supply

2 x AA – alkaline or rechargeable NiMH batteries

Battery life  
(the device turned on and transmitting)

40 h typ.

Dimensions (L x W x D)

117 x 79 x 24 mm

Weight (with batteries)

200 g

Working temperature range

0..40  $^{\circ}$ C