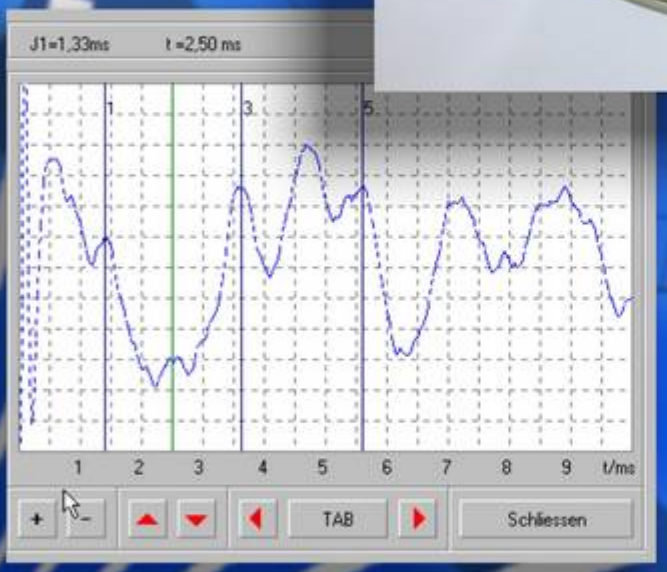
HOMOTH

MEDIZINELEKTRONIK GMBH & CO KG

BERA 4000
brainstem-audiometry



we are one of the
leading companies
in the field of ENT diagnostics
- worldwide -

BERA 4000

The HOMOTH ABR / BERA- module is a real time brainstem audiometer. It is developed considering the latest knowledge of the ENT research.

By use of most modern processors, a wide range of possibilities is opened. It is a system lasting into the future for a lot of years, because all changes in diagnostic demands can be loaded as an update or upgrade via software into the system.

The software contains pre-selected standard programs, to reduce the operation of the system onto a few key-moves. Beside this, it is possible to create storable measuring programs with individual parameter selections. Further more, the EXPERT-MODE allows to create and change settings during measurement sessions and adapt to changing situations or patients condition.

16 curves can be measured per examination and stored into a temporary memory. The evaluation / analysis can be done afterwards at a later time. All curves are presented high resolution at the colour screen of PC. The program is menu controlled and fitted with a online help.

The brainstem system is expandable with electronystagmografy (ENG/VNG) and/or otoacoustic emissions (OAE).

Technical data

system:	micro processor controlled with measurement of electrodes impedance
system requirements:	Pentium PC min. 500 MHz, USB 2.0 port, Window 98, ME, 2000, XP
standards:	EN 60601-1 / 1-1 / 1-2 and AGERA rules
isolation:	galvanic separated electrodes
stimulus:	1. click 50 - 500 us
	2. sinus (in preparation)
polarity:	positive, negative and alternating
intensity:	0 - 110 dB SPL
rate:	1 - 50 per sec in 0,1 steps
masking:	0 - 80 dB white noise
measurement:	1 channel (ipsi / contra)
EEG amplifier	80 dB / input imp. > 48 MOhm / automatic or manual gain selection
converter:	A/D 12 bit / 100 kHz
averager:	max 10.000 sweeps
analysis time:	10 ms (early potentials)
artefacts:	online elimination (time and amplitude)
filters:	1. highpass 100 - 150 - 200 - 300 Hz
	2. lowpass 1 - 2 - 3 - 8 kHz
	3. software filters
	4. 50 Hz notch filter
results:	1. curve diagrams 8x right und 8x left
	2. latency diagram
	3. direct comparison right / left
dimensions	W = 32 / D = 27 / H = 7,5 cm
weight	1,8 Kg
measure cable, lenght	275 cm + 60 cm electrodes cable
power consumption	13,2 V 15 W
accessories:	1 headphone DT 48 A
	1 measure cable with 3 electrode clamps, red - yellow - black
	1 bag standard electrodes at 50 pieces
	1 power pack
	1 set cables
	1 program CD
	1 instruction manual

CE 0124

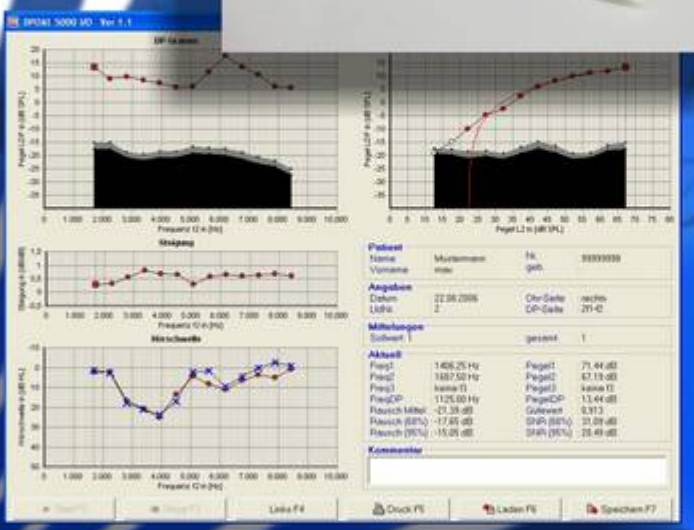
Rev.04 / Stand 01-2007

HOMOTH Medizinelektronik GmbH & Co KG, Baumacker 1a, 22523 Hamburg
Tel.: ..49..40-54 72 65 0 Fax: ..49..40-54 72 65 50
Internet //www.homoth.de e-mail: info@homoth.de

HOMOTH

MEDIZINELEKTRONIK GMBH & CO KG

DP-OAE 4000
otoacoustic emissions



we are one of the
leading companies
in the field of ENT-diagnostics
- worldwide -

DP-OAE 4000

Lately the Otoacoustic Emissions (OAE) have become more and more important in the field of objective diagnosis at sensorineural deafness. Using the T-OAE measurement (Transient Evoked Otoacoustic Emissions) clicks will cause a wide-band-irritation, using the DP-OAE´s specific frequencies for irritation, (Distorsion-Products Otoacoustic Emissions) it is possible to provoke, measure and evaluate frequency related parts of the cochlear. A sound proof cabin is not necessary, only a noise-reduced area.

By continuous stimulation with two presetable primary sinus tones(f1, f2), the selected area of the cochlea is provoked. The DP-OAE method increasingly rises in clinical means.
This unproblematic and quick measurement is suitable for all age groups. Especially as a precaution-examination for children and newborns this method is established worldwide.
In this occasion, already a low distinctive hearing-loss, at the begin of a deafness, can be recognized.

From screening measurements in the paediatrics using 4 frequency-areas up to clinical examinations containing 10 frequency-areas, the HOMOTH DP-OAE 4000 covers the entire spectrum of test demands of regular DP OAE measurements. The two measure-requirements **DP 1 = $2F_1 - F_2$** or **DP 2 = $2F_2 - F_1$** and averaging in time or in spectral area, makes this device suitable to a wide range of diagnostic.

In addition, the HOMOTH DP-OAE offers a "Hearingloss-Mode". Using this mode, a predefined (By doctor or audiologist) number of frequencies is tested by decreasing the input of SPL. The SPL range lasts from 70dB to 0,5dB splitted into 0,5dB steps. Using an algorithm, the DP-OAE software is able to determin the hearingloss. This method is very helpful in cases a "real" tone-audio can not be realized.
Ensuringing the optimal positioning of the probe, a "best-fit-test" is integrated. A volume measurement is testing probe-stability during the complete measurement.

In order to make measurements more reliable, two additional methods of surpressing artefacts and unwanted responses are used. First, a third frequency (f3, surpressor tone) can be added in order to avoid finestrukture of the response and work out the distorsion products with very high quality. Second, the output is set into a phase-relation to the inputsignal. Doing this, steady occuring artefacts will be spotted, specially marked and taken out of the evaluation.

The results of the diagnostics are diplayed within the following graphics: DP-Diagram, Input/Output-Funktion, Slope, Hearing-Loss-Diagram. A special 3-D graphic allows to see all evaluated curves in one diagram, which can be turned into all directions for easy analysis.
All data is stored on harddisc of the computer. Other HOMOTH diagnostic-moduls can be connected to the computer and use the same patients-datafiles.

technical data

System :	PC-module with microprozessor controller and USB 2.0 port
system requirements:	Pentium PC min. 500 MHz, USB 2.0 port, Window 98, ME, 2000, XP
Standard :	EN 60601 -1 / 1-1 / 1-2 / MPG / NUB rules
Stimulus :	562 Hz to 9,843 kHz
Intensity :	0,5 dB SPL to 70 dB SPL choosable in 0.5 dB steps level differences free selectable
Probe :	miniature design with pressure ventilation and half autom. self-cleaning
Probe control :	with best-fit-test and realtime control view of stimulus and spectrum
Averaging :	all sweeps can be averaged in time- or spectralarea
Results-presentation :	DP-graph with signal, noise, and the corresponding spectrum input / output function - slope - hearing loss in HPL alternatively evaluation of DP 1 = $2F_1 - F_2$ or DP 2 = $2F_2 - F_1$
Dimensions / weight :	290 X 250 X 75 mm (B, L, H) / 1,8 Kg (probe-weight 12 g)
Probe cable:	2000 mm, flexible with fastening clip
Power pack :	+ 13,2 V = (MSELV) / 15 W
Accessories :	1 miniature probe complete 30 earplugs in 5 different sizes 1 external power pack 1 USB cable 1 program CD 1 instruction manual

technical modifications reserved

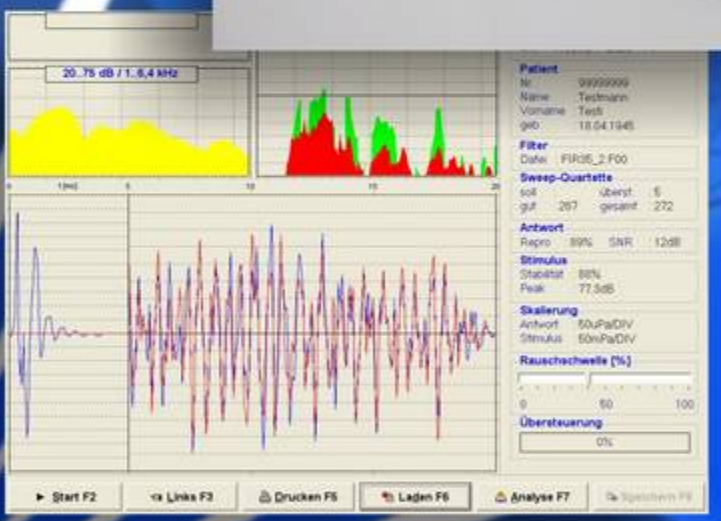
CE 0124

Rev 04 / Stand 01-2007

HOMOTH Medizinelektronik GmbH & Co KG, Baumacker 1a, 22523 Hamburg
Germany Tel.: ..49-40-54 72 65 0 Fax: ..49-40-54 72 65 50
Internet //www.homoth.de e-mail: info@homoth.de

HOMOTH
MEDIZINELEKTRONIK GMBH & CO KG

T-OAE 4000
otoacoustic emissions



we are one of the
leading companies
in the field of ENT-diagnostics
- worldwide -

T-OAE 4000

As a world novelty, HOMOTH treads new paths in evaluating results of measured Otoacoustic Emissions. All measured data is classified according to signalstatistic and signaldynamic features. The result is transmitted to an expert system as parameter vectors. The expert system, containing

more than 10.000 evaluated OAE measurements,

compares all parameter vectors with the stored samples.

The analysis module consists of an artificial neuronal network, supplemented by modern fuzzy logic. The result is transmitted to the personal computer, via USB port, and is presented on the monitor.
Using the HOMOTH expert system an objective result of a hearing test, comparable to subjective evaluation of an experienced OAE expert, is possible.

The actual measured data is compared and evaluated automatically within a few seconds. So everybody is able to use the special knowledge of many OAE experts. The analysis module evaluates the signalstatistic- and the signaldynamic parameters, the artefacts are eleminated and the characteristic components of the emissions are isolated. The screen shows the SOAE, TE-OAE and the artefacts.

Therefore the HOMOTH expert system also allows the untrained user of the OAE system, a very high safety regarding the statement of result.
As for a classical OAE measurement, all relevant diagrams are displayed at the monitor.

The HOMOTH TE-OAE expert connects all advantages of the classical OAE diagnostic with the most modern computer technology as neuronal networks and fuzzy logic.

Technical data

system requirements :	Pentium PC min. 800 MHz, Windows 98 / ME / 2000 / XP
	USB port version 2.0 or free PCI 2.1-slot with USB Port 2.0
standards :	EN 60601 -1 / 1-1 / 1-2 / MPG / NUB rules
stimulus :	clickquartett (3 pos. / 1 neg.) 20 ms rate
intensity :	ca. 80dB with automatical gain control
probe :	miniature design with pressure ventilation
	realtime probe control via FFT
converter :	12Bit / 100kHz
amplifier :	80dB with automatical gain setting
measurement :	manual adjustable 16,32,64,128,256,512 clickquartetts
artefacts :	automatical artefact recognition and elemination,
results presentation :	time window with two correlating measurements in different colours
	time window with the spontaneous emissions
	maxima of the emissions
	realtime spectrum of the stimulus
	spectrum of the emissions / spectrum of the noise
	ZF correlation F/t
	parameter for SNR, stability, reproduction
	numbers of the artefacts and the given stimuli
	automatical analysis of the results after the expert system
	(certain positiv, positiv, poor positiv, negativ, certain negativ)
dimensions/ weight :	290 X 250 X 75 mm (W, D, H) / 1,8 Kg
probe-cable:	2000 mm, high flexible with a patients clip for fastening
power consumption :	15 W
accessories :	1 miniature probe, complete with 30 ear plugs in 5 different sizes
	1 extern power pack
	1 communikation cable USB 2.0
	1 program CD
	1 instruction manual

CE 0124

Rev.04 / Stand 01-2007

HOMOTH Medizinelektronik GmbH & Co KG, Baumacker 1a, 22523 Hamburg
Tel.: +49..40-54 72 65 0 Fax: +49..40-54 72 65 50
Internet //www.homoth.de e-mail: info@homoth.de