

Otoacoustic emissions - TEOAE - DPOAE - SOAE - ABR

lab  
 e



Screening and clinical modality - Programmable protocols



The **Echolab** is an advanced, fast and easy handled instrument testing Otoacoustic Emissions with dual aims. On the one hand, it needs the requirements of the newborn screening.

On the other it fixes the stimulant aim of satisfying the different needs of ORL Specialists, Audiologists, Pediatricians, by combining an extremely simple use

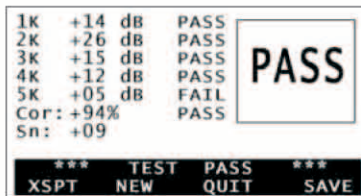
with a wide range of softwares.

In this way, it guarantees both a daily clinical use and research, allowing to be well informed to the continuous scientific and technological innovations.

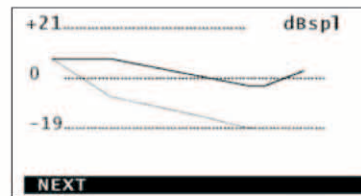
It's possible to submit several kind of OAEs, TEOAE, DPOAE, SOAE, suppression test (noise insert optional) and ABR test.

## All Reports In The Display

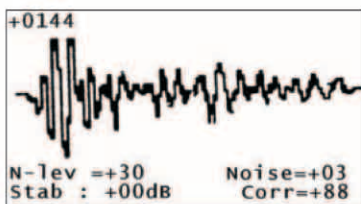
All detailed test reports are always available, from the simple PASS/REFER result, to the complete graphic trace of TEOAE, DPOAE and ABR and allows you to evaluate their real quality.



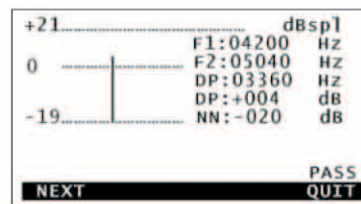
**TEOAE**  
automatic  
PASS/REFER  
final result



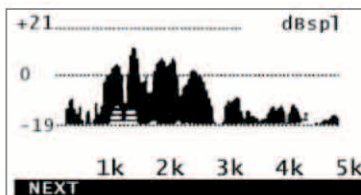
**DPOAE**  
DP-gram  
complete  
with Signal  
and noise



**TEOAE**  
acquired  
signal



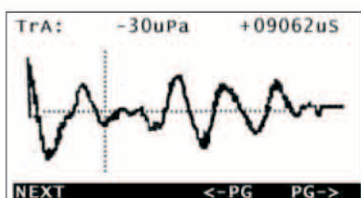
**DPOAE**  
bar chart  
of F1/F2 and DP  
With pass  
mathematic  
information



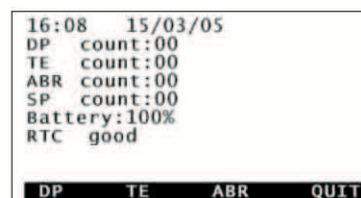
**TEOAE**  
signal  
spectrum



**PROTOCOLS**  
selected  
by user

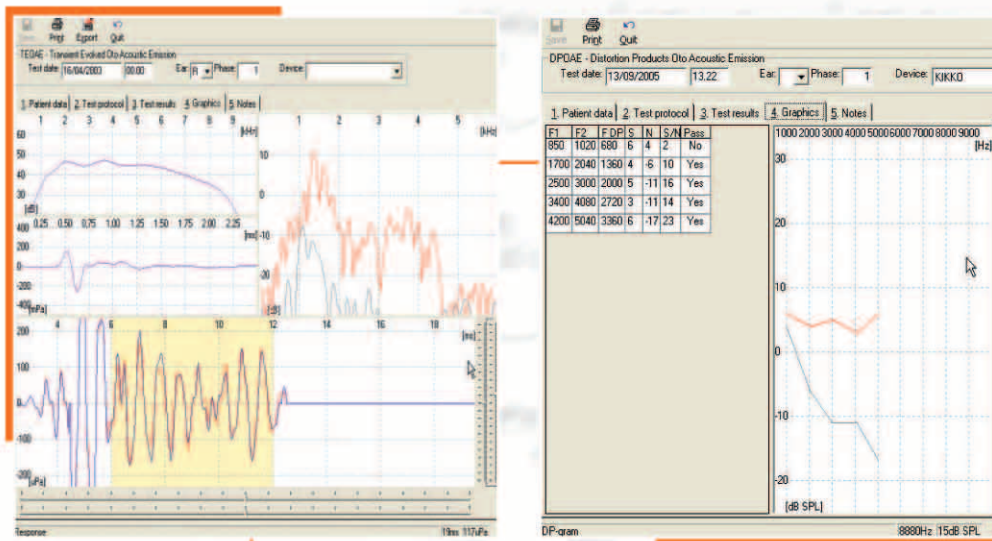


**TEOAE**  
elaborated  
Teoae graph



**TEST COUNT**  
executed by type  
and recalling  
on display

## Audiologic, the winner Database management

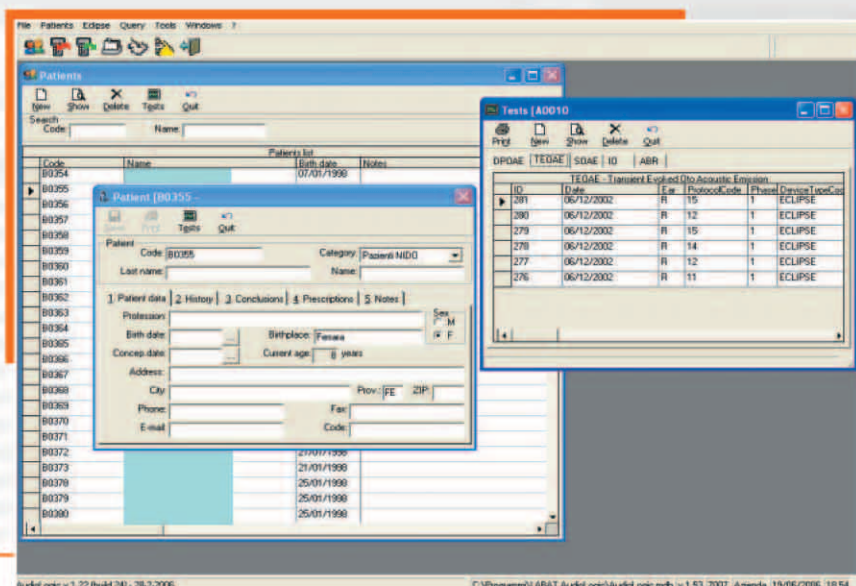


The **Audiologic** software, available with **Echolab**, gives you the complete data control. It is possible to transfer data via USB on your PC in a few seconds. TEOAE, DPOAE, SOAE, ABR can be stored and the complete graphical tests can be visualized for future evaluations.

## Patient file

The patient's file records personal data and specific informations about his/her case history, cures and the use of hearing aids or cochlear implants.

It is possible to associate digital images using Windows image viewer softwares. Moreover, it is easy to access each file searching by patient's name or individual code.



## Test data

The **Echolab** can interactively display stored tests and create new ones. The screen reporting graphical test can be linked and extended, allowing a comparison between the same or different tests.

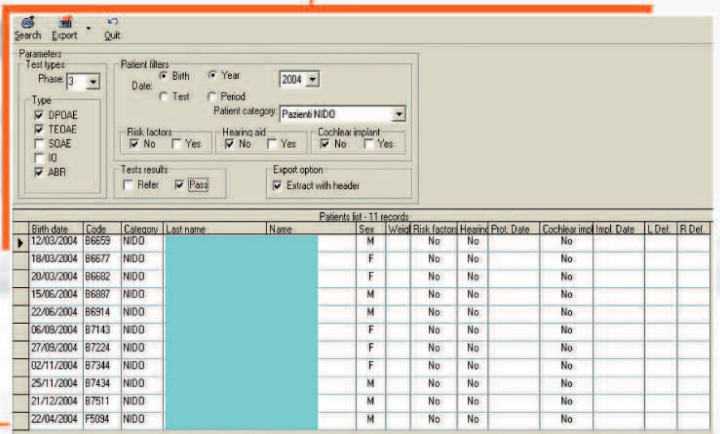
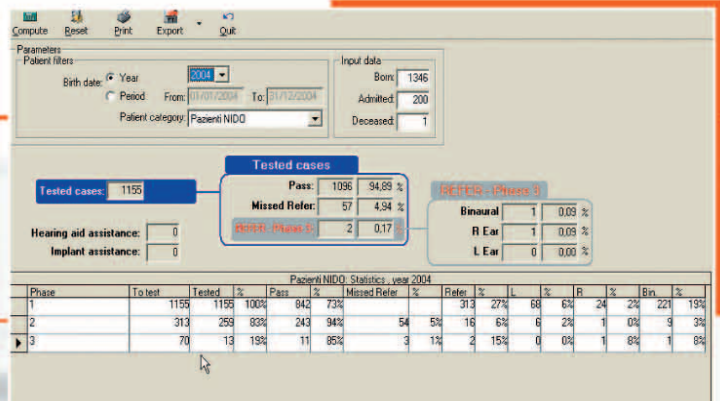
## After the screening, audiologic elaborates data

Audiologic can elaborate several statistic functions.

It is possible:

- to draw out patient's data "refer" in a single or in successive moments;
- to export data to external files;
- to elaborate automatic prints of personalized letters addressed to patients for the re-test.

It is possible to use several kinds of filters to extract data (for example date of birth, test date, period, PASS, REFER and so on).

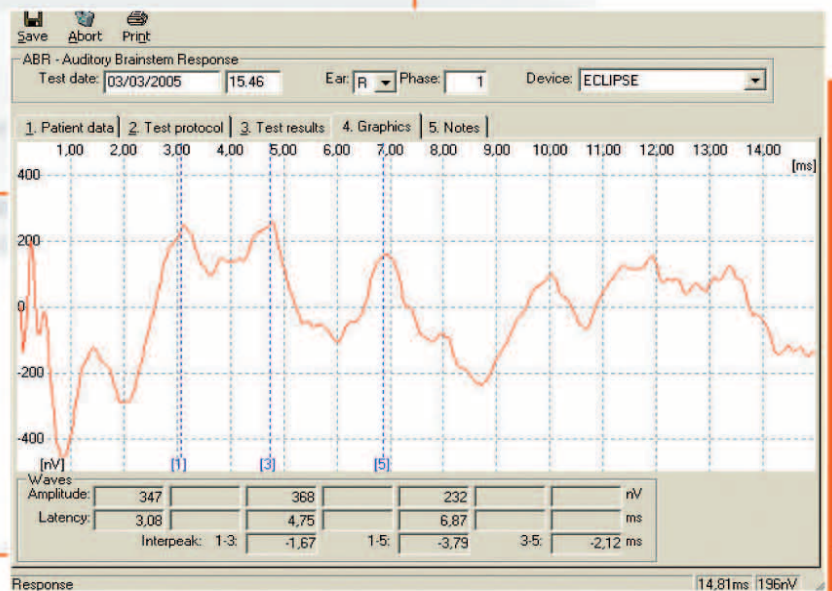


## ABR test

The Echolab can be implemented with a preamplifier for evoked potentials (optional), in order to submit ABR test, stimulating with an acoustic click with the same OAEs test probe.

This function permits to verify the impedance of the electrodes before starting the test, in order to be sure of their right placement and visualize, in real time, the ABR trace during data capture.

It is possible, through the appropriate marker, to identify the peaks of the waves for the automatic measurement of the latency time. The intensity of the stimulus can be programmed by the user.

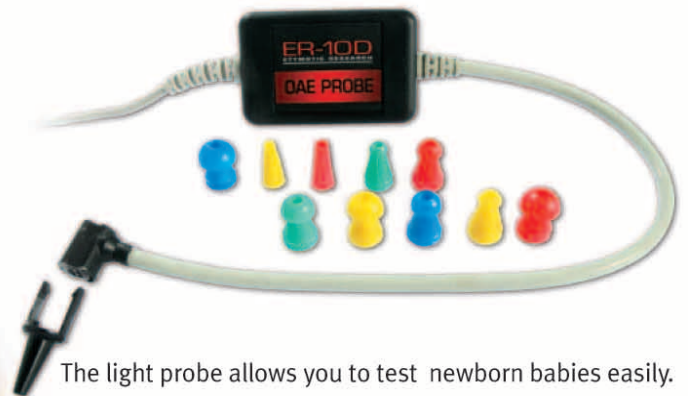


## *Screening* Simple to use, this is its power!



The **Echolab** is the best solution for newborn babies screening. Its intuitive use, thanks to the interactivity between the display and the keypad, allows the user to run the test at its best performances. The probe automatic control, its calibration and the real time ground noise checking give reliable test results. The **Echolab** can be used in nurseries, hospitals, clinics and medical offices. Its memory storing system guarantees the backup of 250 tests, before connecting to the PC for data transfer.

## *Probe, light and easy to clean*



The light probe allows you to test newborn babies easily. It is also a detachable device which is easy and quick to clean.



Ear tips in different sizes are available. The particular conformation of the tips and their softness facilitate the insertion into the ear canal of the newborn baby, providing high isolation from external noises.

# OAE specifications

**Labat Echolab OAE:** records otoacoustic emissions for screening and clinical investigation with optional ABR. The device is handheld and has an alphanumeric keyboard.

## OAE

- TEOAE transient
- DPOAE distortion products
- SOAE spontaneous

## TEOAE - linear and non linear

- Frequency range from 500 to 8000 Hz
- Frequency resolution: 50 Hz
- Frequency accuracy:  $\pm 0,01\%$  of displayed value
- Stimulus intensity: 0 to 85 dB SPL
- Level measurement accuracy:  $\pm 2$  dB SPL
- Dynamic range: 90 dB SPL

## DPOAE - distortion products

- Frequency range from 250 to 10.000 Hz
- Frequency resolution: 5,10, and 25 Hz programmable
- Frequency accuracy:  $\pm 0,01\%$  of displayed value
- Stimulus intensity: 0 to 90 dB SPL
- Level measurement accuracy:  $\pm 2$  dB SPL
- Dynamic range: 90 dB SPL

## SOAE - Spontaneous

- Input sensitivity: -30/+30 dB SPL
- Frequency range: 100 - 10.000 Hz
- Amplitude resolution: 2 dB
- Suppression test with contralateral masking by optional insert for masking (optional)

## LCD

- High definition graphic screen: 128x81 pixel displaying input signal, OAE trace, Cross Spectrum, DP-gram, PASS/REFER test results.
- ABR traces displayed.

## OAE GENERAL CHARACTERISTICS

sampling	TEOAE	DPOAE		SOAE	
	25600	20480	25600	40000	40960
samples for frequency	512	4096	1024	4000	2048

- Microphone system noise: -15 dB SPL at 1000 Hz -20 dB SPL a 2000 Hz
- Response accuracy: 2 dB SPL microphone and in situ sound level (calibration)
- Calibration: self-test and in situ before testing

## OAE ACCESSORIES

- Etymotic ER-10D probe with adult and newborn tips
- Set of adult ear tips; Set of newborn silicon ear tips
- 1 rechargeable NiMh battery
- Universal battery charger
- CDROM with software Audiologic
- Carrying case
- Multilanguage Instruction Manual
- Optional insert phone for contralateral masking (SOAE)

## INTERNAL DATA STORAGE AND DATA TRANSFER

- Internal data storage: up to 250 test records
- Built-in USB COM port

## POWER SUPPLY

- Built-in battery lasting up to 8 hours
- Automatic warning of low battery status
- Universal battery charger

# ABR specifications

## ACQUISITION

- 16 Bit ADC - CMR (Common mode rejection): 100dB
- Pass band: 100 Hz to 2500 Hz (fixed), preset Smoothing
- Analysis time: 10, 12 o 15 ms protocol programmable
- Stimulation rate: up to 18/s, protocol programmable
- Sweeps: 1000
- Artifact reject by amplitude. Number of rejects displayed

## STIMULATION

- Click: positive and negative
- Stimulus intensity: max output 85 dB pe SPL

# General information

## ENVIRONMENTAL

Storage/transport temperature: -20°C to +50°C; -4°F to +122°F  
 Operating temperature: +15°C to +35°C; +60°F to +95°F  
 Operating relative humidity: 30% to 90%, non-condensing

## MECHANICAL

Dimensions: cm 9,5 (w) x 23 (h) x 5,5 (d) - 3,7" (w) x 9" (h) x 2,2" (d)  
 Weight: net 493 grams - including battery

## STANDARDS

Audiometric equipment: EN 60645-1 (1994); EN 60645-3 (1995);  
 ANSI S3.6 (1996); EN ISO 389 (1995);  
 Safety: EN 60601-1 (1990) Class 2 type B;  
 EN 60601-1-1 (2001) - EMC; EN 60601-1-2 (1993)

## ELECTRODE IMPEDANCE

- Monitor of single electrode and differential impedance

## GRAPHIC DISPLAY

- ABR waveform during acquisition
- ABR acquired trace with analysis time scale
- NV latency with cursor

## ABR ACCESSORIES STANDARD

- ABR preamplifier with cable
- Surface pediatric electrodes, 3 pieces