Titan

ABRIS, OAE, Impedance

Fast, multi-purpose and portable

Interacoustics®

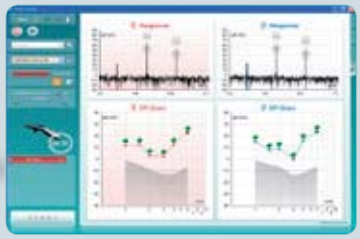
leading diagnostic solutions

Titan
ABRIS, OAE, Impedance

The Titan concept

Titan Impedance

Titan
Impedance, DPOAE, automated ABR choose between one, two or all modules



Titan DPOAE

Titan automated ABR (ABRIS)

The Titan is a modular platform with clinical impedance, clinical DPOAE and **automated** ABR (ABRIS) options. This flexibility permits the creation of an ideal screening instrument or advanced diagnostic tool.

Modularity lets you expand with optional modules at a later time to meet your growing clinical requirements.

Titan

- *Portable and lightweight*
- *Fully customizable*
- *Complete clinical test battery*
- *Flexible printout with .PDF capability*
- *Integrated and customized display and reporting*
- *PC integration and standalone option*

Easy handling

The sleek, slim and lightweight form of the Titan accommodates easy handheld operation. The contemporary design and high-resolution color display offer easy monitoring of test results with an extremely professional appearance.

The color LED on the extension probe provides information on test status and test ear, while a button on the probe box initiates the test or changes between right and left ear.

Micro-technology stores calibration values within the probe, which permits quick replacement in the field without further calibration.

Titan carrying case

Probe light indicates status and test ear.

Right ear ***Left ear*** ***In ear*** ***Blocked/leaking***

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Titan
IMP440 module

The impedance module

The impedance module (IMP440) is available in a screening, diagnostic or clinical version allowing you to configure the Titan for the tests you need. The test battery features standard tympanometry, ipsi- and contralateral acoustic reflexes, reflex decay and reflex latency, as well as three Eustachian tube function tests. Together with optional high frequency probe tones (678, 800 and 1000 Hz), IMP440 is designed to meet and perform the most demanding of clinical testing requirements. Each version comes with preloaded factory protocols as well as the option for creating one's own test protocols and sequences.

Tympanometry
Interacoustics utilizes two beneficial advanced technologies to acquire tympanograms. The first is an "endless airflow" technology which improves the instrument's ability to obtain a tympanogram on difficult-to-test patients or when a slight leak is present. The second is an intelligent pump control system with an adaptive speed control around the tympanic peak. This feature, combined with high-resolution recording of both compliance and pressure level, provides the fastest and most reproducible tympanometry measures available.

Acoustic reflex test
Acoustic reflexes are measured ipsi- and contralaterally (through a headphone or insert phone). Protocols can be set up for quick screenings at a single intensity or for fast reflex threshold searches. Manual testing at individual frequencies and intensities is also available. The optional Automatic Gain Control (AGC) also provides accurate and safe intensity reflex stimulation for small ear canal volumes.

Reflex Decay
Acoustic reflex decay testing is available with ipsilateral as well as contralateral stimulation using a single EarTone3A or optional, TDH39/DD45 headphone.

Reflex latency
The reflex latency test focuses on the first few hundred milliseconds of the acoustic reflex. It allows a detailed investigation of the onset of the reflex as a function of stimulus type and intensity. As in decay testing, Titan will automatically search for the reflex threshold if that is not yet known, and perform the ipsi- or contralateral stimulus 10 dB above the threshold level.

Three Eustachian tube function tests
Titan performs three different Eustachian Tube Function tests for different conditions of the eardrum and Eustachian tube: ETF for intact eardrum, ETF for perforated eardrum, and ETF for a patulous Eustachian tube. In addition to recording information about Eustachian tube function, the third ETF test is suitable for measuring spontaneous changes in the middle ear system (e.g. due to heart beat pulsation in a glomus tumor). Acoustic reflexes evoked by a cochlear implant can also be easily measured.

Extension cord with shoulder unit and probe indicator LED
At times when the clinician cannot step away from the patient, the extension cord with the shoulder box enables full operational control (ear choice, start/stop) and the LED indicates if the probe is sealed correctly or blocked.

Clinical impedance highlights

- *Automatic and manual testing*
- *High frequency probe tones (678, 800 and 1000Hz)*
- *Ipsi and contra acoustic reflexes*
- *3 ETF tests: Intact, perforated and patulous*
- *Reflex decay*
- *Reflex latency*

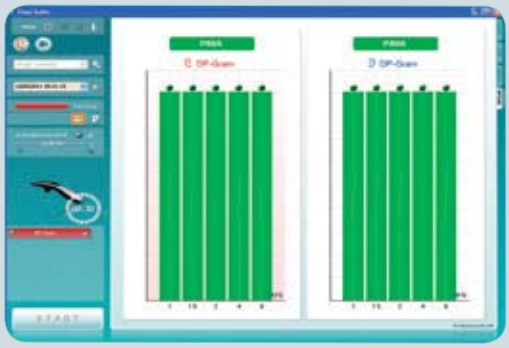
Titan
DPOAE440 module

The DPOAE module

The Titan has full clinical Distortion Product OAE capabilities with the addition of the DPOAE440 module.

DP GRAM protocols include test frequency ranges from 500 to 10kHz, with multiple stop criteria options to satisfy your personal clinical requirements. Pass/Refer indicators are also selectable for user convenience. Upon test completion, the operator can manually select single frequency rechecks without starting from the beginning.

DP/Input-Output protocols are also available for those who wish to perform more extensive OAE investigations.



DPOAE440 DP-Gram - a PASS (Bar view)

DPOAE highlights

- *Noah & HiTrack compatibility*
- *Handheld or PC Controlled use*
- *Customizable protocols*
- *500Hz – 10kHz (1kHz – 6kHz Screener)*
- *Customizable PASS/REFER criteria*
- *DP-Gram or DP-I/O tests available*
- *Bar or Graph View*

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Titan
ABRIS440 module

The ABRIS ABR infant screener module (Automated ABR)

A unique automated screening ABR technology is available with the addition of the ABRIS440 module making the Titan a multifaceted and ideal infant screening device. The CE-Chirp® stimulus commonly reduces test times by as much as 50%! Results are displayed in an easy to understand manner, providing real-time test information. A Hi-Track transfer interface is provided within the database program. Simple protocols are pre-loaded but may be modified to user preferences.

ABRIS440 - PASS

Reliability
Dependable and trusted results are a key feature of the ABRIS440. A 99.9% sensitivity - or confidence index - aids in properly detecting babies with hearing problems with a 96% specificity, which is crucial for excluding babies with normal hearing.

Easy to Use
After patient preparation and viewing electrode impedance status, you simply press 'Start' and let the test run to completion upon which a Pass/Refer status indication will appear.

Transducer Options
Unlike any other system, the ABRIS440 comes with the possibility to use 3 different transducers – which is dependent on your test situation and patient requirements. The user has the choice of using the standard Impedance probe, insert phones or traditional headphones. The correct calibration files are identified by the pre-amplifier for each transducer.

CE-Chirp®
The primary secret to the ABRIS is stimulation with the CE-Chirp®. The patent pending CE-Chirp® enhances the synchronized firing of the auditory nerve which doubles the size of the responses and in turn allows faster response detection times by as much as 50%. The improved responses and detection times have been documented in numerous scientific studies including thousands of patients.

ABRIS highlights

- *Noah & HiTrack compatibility*
- *Handheld or PC Controlled use*
- *Customizable protocols*
- *CE-Chirp® stimulus*
- *Results displayed as PASS/REFER*
- *Three transducer options*

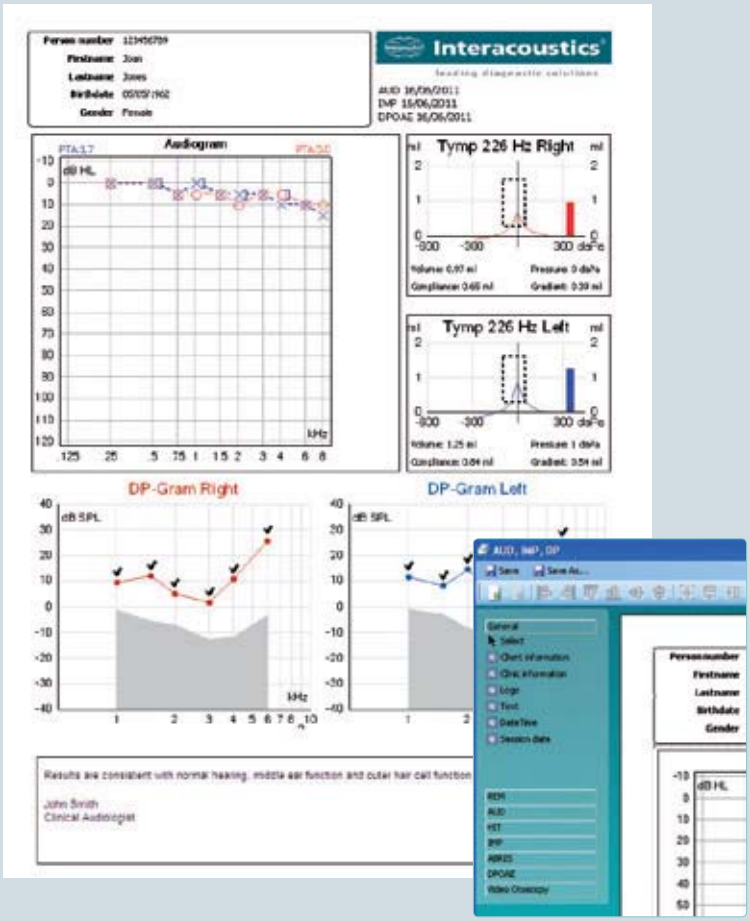
CE-Chirp® *is a stimulus family designed to compensate for the cochlear travel time. The result is a synchronized neural firing of the nerve fibers creating up to twice the response amplitude compared to standard click.*

Design your own reports

Although electronic communication plays an increasing role in audiology, the printed report is still important. The Titan software suite includes an embedded print wizard. This flexible tool enables customization for individual reporting needs, as well as adherence to internal reporting and archiving structures to streamline clinic workflow.

The print wizard can merge data from all three modules and other Interacoustic Suites for full patient reporting. Once completed, test data is automatically routed to predefined templates, eliminating redundancy and the labor intensive tasks routinely involved in getting all information presented on a single page. Reports can either be printed or saved as .PDFs for insertion into EMR systems.

The optional printer



Merge and configure input from different sources in the Print Wizard

Reporting highlights

- *Customizable print-outs*
- *NOAH3 and OtoAccess™ compliant*
- *EMR integration*
- *Portable printer option*

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Titan
Specifications

Specifications Titan Hardware:

Medical CE-mark:	The CE-mark indicates that Interacoustics A/S meets the requirements of Annex II of the Medical Device Directive 93/42/EEC. Approval of the quality system is made by TÜV – identification no. 0123
ETL:	Approved
Standards:	**Safety:** IEC 60601-1, Internally powered, Type B+BF applied parts **EMC:** IEC 60601-1-2 **Impedance:** IEC 60645-5/ANSI S3.39, Type 1 **Test signal:** IEC 60645-1/ANSI S3.6 , IEC 60645-3 **OAE:** IEC 60645-6 2009, Type 2 Otoacoustic emissions **ABR:** IEC 60645-7 2009, Type 2
Probe specifications:	**Titan IOW probe:** IMP, DPOAE and ABRIS capable Replaceable probe tip **Test Pressure:** Ambient pressure.
PC control:	**USB:** Input/output for computer communication. Titan can be fully operated from a PC. The measurements can then be followed on the PC screen. Data can be sent to and saved on the PC and stored in the Interacoustics database OtoAccess™. See separate section in Service Manual for programming details.
	Memory: Theoretically, an infinite amount of test results can be stored on the PC. The Titan hand held unit is delivered with a 1 Gb memory card, enough for storing more than a quarter of a million tests.
Thermal printer (Optional):	**Type:** Thermal (Bluetooth) printer with recording paper in rolls. Print on command through Bluetooth communication and through serial RS-232. **Paper width:** 57.5 ± 0.5 mm on thermal printer **Printing time:** Printing time depends on the size of the used protocol. For 2 tympanograms and 8 reflexes the thermal printer uses approximately 6 s.
Titan Dimensions:	6x6x28cm/2.4x2.4x11inch
Titan Weight:	360g /0.8lbs
ABR/OAE/IMP shoulderbox Weight:	120 g / 4.2 oz
ABR/OAE/IMP shoulderbox Dimensions:	102, 68, 26 mm / 4x2.7x1 inch
OAE/IMP shoulderbox Weight:	64 g / 2.3 oz
OAE/IMP shoulderbox Dimensions:	65, 35, 18 mm / 2.6x1.4x0.71 inch

Read more here:
www.interacoustics-us.com/com/Titan

Specifications DPOAE440 software:

Stimulus

Frequency range:	500 to 10000 Hz
Frequency step:	25 Hz
Level:	30 to 80 dB SPL (75 dB SPL for 6kHz and 65 dB SPL for 8kHz to 10kHz)
Level Step:	1 dB
Transducer:	IOW Probe auto detection, auto calibrated

Recording

Analysis time:	Minimum 2 seconds to unlimited time
A/D Resolution:	24 bit, 5.38 Hz resolution
Artifact rejection system:	-30 to +30 dB SPL or off
Stimulus tolerance:	Adjustable between 1 and 10 dB
SNR criteria:	Adjustable between 3 and 25 dB
Probe check window:	256 points frequency response of the ear canal due to a click stimulus.
DP-response window:	4096 points frequency response

Display

General display gain:	Applicable during testing
Display:	Stimulus level and type, Bar and Graph view

Probe specifications

Titan IOW probe:	IMP, DPOAE and ABRIS capable Replaceable probe tip

Other

Test types:		**Screener**	**Clinical**
	DP-Gram	500-6000Hz (max. 6 test points)	500-10000Hz
	DP-I/O	n/a	x
	Add test/measurement point	n/a	x
	Enable Pass/Refer	x	x
Test Pressure:	Ambient pressure.		
Included parts DPOAE440 module:		**Screener**	**Clinical**
	Titan handheld unit with basic probe	x	x
	Cradle	x	x
	ASA30M Power supply (with converter)	x	x
	Clinical probe extension	x	x
	BET55 Ear tips and box	x	x
	DG – LiBat – 001 back-up battery	x	x
	4 cavities (0.2, 0.5, 2 and 5cc)	x	x
	Titan PC suite with DPOAE440	x	x
	OtoAccess™ database	x	x
	USB cable, USB adaptor	x	x
	Operation manual	x	x
	Multilingual CE manual	x	x
	TCB Carrying Bag	x	x
Optional parts DPOAE440 module:	Short probe extension	optional	optional
	Thermal printer AB1310/AB1310 Bluetooth	optional	optional

Titan
Specifications

Specifications IMP440 software:

Impedance Measuring System

Probe tone:	Frequency; 226 Hz. Optional 678 Hz, 800 Hz and 1000 Hz Clinical version Optional 1000 Hz Diagnostic version Level: 69 dB HL with AGC, assuring constant level at different ear canal volumes.
Air pressure:	Control: Automatic. Indicator: Measured value is displayed on the graphical display. Range: -600 to +300 daPa. Pressure limitation: -750 daPa and +550 daPa. Pressure change rate: Very slow, Slow, Medium, Fast, Automatic with slow speed at compliance peak. Selectable in the set-up.
Compliance:	Range: 0.1 to 8.0 ml at 226 Hz probe tone (Ear volume: 0.1 to 8.0 ml) and 0.1 to 15 mmho at 678, 800 and 1000 Hz probe tone.
Indicators:	Graphical display Compliance is indicated as ml and pressure as daPa. In PC-controlled mode admittance, susceptance and conductance can be printed. Stimulus level is indicated as dB Hearing Level.
Memory:	Tympanometry: 1 curve per ear per tympanometry test. 3 curves per ear per Eustachian tube function test. And theoretically an infinite number of tests per protocol.

Test types:	**Diagnostic**	**Clinical**
• Tympanometry Automatic (flexible start and stop pressure)	x	x
• Tympanometry Manual	-	x
• ETF1 – Non perforated eardrum (Williams test)	x	x
• ETF2 – Perforated eardrum (Toynbee test)	n/a	x
• ETF3 – Patulous Eustachian tube (Sensitive baseline tympanometry for 10 up to 60 seconds)	n/a	x

Reflex Functions

Signal sources:	Tone - Contra, Reflex: 250, 500, 1000, 2000, 3000, 4000, 6000, 8000 Hz. Tone - Ipsi, Reflex: 500, 1000, 2000, 3000, 4000 Hz. NB noise - Contra, Reflex: 250, 500, 1000, 2000, 3000, 4000, 6000, 8000 Hz. NB noise - Ipsi, Reflex: 1000, 2000, 3000, 4000 Hz. Noise - Contra, Reflex: Wide Band, High Pass, Low Pass. Noise - Ipsi, Reflex: Wide Band, High Pass, Low Pass.
Outputs:	Contra Earphone: TDH39 earphone, DD45 earphone, EARtone 3A and/or CIR55 insert for Reflex measurements. Ipsi Earphone: Probe earphone incorporated in the probe system for Reflex.

Test types:	**Diagnostic**	**Clinical**
• Automated Reflex with single intensities or reflex growth		
- Ipsilateral	x	x
- Contralateral	x	x
• Manual control of all reflex functions	x	x
• Reflex decay, automatic 10 dB above threshold or manually controlled with stimulus duration of 10 up to 30 s	x	x
• Reflex latency, automatic 10 dB above threshold or manually controlled, first 300 ms from stimulus start	n/a	x

Read more here:
www.interacoustics-us.com/com/Titan

		Diagnostic	Clinical
Included parts IMP440 module:	Titan handheld unit with basic probe	x	x
	Cradle	x	x
	ASA30M Power supply (with converter)	x	x
	Clinical probe extension	x	x
	EARtone3A insert contra phone	x	x
	BET55 Ear tips and box	x	x
	DG – LiBat – 001 back-up battery	x	x
	4 cavities (0.2, 0.5, 2 and 5cc)	x	x
	Titan PC suite with IMP440	x	x
	OtoAccess™ database	x	x
	Operation manual & Multilingual CE manual	x	x
	TCB Carrying Bag	x	x
Optional parts IMP440 module:	Short probe extension	optional	optional
	Thermal printer AB1310/AB1310 Bluetooth	optional	optional
	DD45C contra cup headset	optional	optional

Specifications ABRIS440 software (ABR Infant Screening):

EPA Preamplifier:	One Channel EPA3 Cable Collector (3 electrodes). 50 cm. **Gain:** 64 dB. **Frequency response:** 0.5 - 5000 Hz. **Noise:** <25nV/√Hz. **CMR Ratio:** > 90 dB. **Max input offset voltage:** 2.5 V. **Input impedance:**10 MΩ/ 170 pF. **Power from main unit:** Isolated power supply
Electrical Impedance measurement:	**Measurement frequency:** 33 Hz. **Waveform:** Rectangular **Measurement current:** 11.25µA. **Range:** 0.5 kΩ – 25 kΩ ± 10 %
Stimulus:	CE-Chirp® range (177 – 11313 Hz) **Stimulus rate:** 90 Hz **Transducers:** EarTone ABR insert phone. TDH 39/DD45 head phone. IOW probe **Channels:** 1. **Level:** 35 dB nHL **Analysis time:** 1-10 min. **Bandwidth:** 22.05 kHz. **A/D resolution:** 24 bit **Artifact reject system:** Rejection level (Peak, Min RMS, Max RMS) Clipping (Saturation) Display Stimulus level and type, bar and graph view
Algorithmic Sensitivity:	CE-Chirp® 99.9%.

		Screener
Included parts ABRIS440 module:	Titan handheld unit with basic probe	x
	Cradle	x
	ASA30M Power supply (with converter)	x
	PreAmplifier w/clothing clip & neckstrap	x
	Short extension cable	x
	ETSE tab surface electrode cables	x
	Ambu tab blue sensor (100pcs.)	x
	SPG15 preparation gel	x
	Alcohol pads, Gauze swabs	x
	USB cable, USB adaptor	x
	BET55 Ear tips and box	x
	DG – LiBat – 001 back-up battery	x
	4 cavities (0.2, 0.5, 2 and 5cc)	x
	Titan PC suite with ABRIS440	x
	OtoAccess™ database	x
	Operation manual & multilingual CE manual	x
	TCB Carrying Bag	x
Optional parts ABRIS440 module:	EarTone ABR earphones	optional
	Thermal printer AB1310/AB1310 Bluetooth	optional
	TDH39 Stereo ID headset	optional
	DD45 stereo ID headset	optional

Interacoustics – the wise choice

With over 40 years of experience, Interacoustics is dedicated to supplying its customers with the best possible solutions for their audiologic needs. This is accomplished by maintaining a continuous dialogue with healthcare professionals working in all sectors of audiology. Our equipment meets the highest possible engineering standards and we provide design expertise that can only come from close contact with clinical practice.

Solutions on every scale

Designing equipment for every size of clinic in so many countries puts us in the unique position of being able to offer solutions that fit your exact requirements. Audiometry, tympanometry, electrophysiology, hearing aid testing, balance investigation are all within our scope and can be integrated to suit your needs.

Designed for diagnostics efficiency

We design equipment to make testing and interpretation easier. This means better interfaces, well designed screen layouts, printed reports and interaction over networks with databases and electronic records systems. In most cases, you can configure the settings and layout yourself.

Support worldwide

The Interacoustics name is not only your guarantee of quality and functionality, but also for support. We operate in over 100 countries worldwide through a well coordinated network of distributors and service centers to ensure that you receive total support and service.

Related products:

Eclipse™:

- EP25 Advanced ABR
- EP15 Clinical ABR
- Interacoustics® ASSR
- TEOAE25 Sreening and Clinical TEOAE
- DPOAE20 Screening and Clinical DPOAE

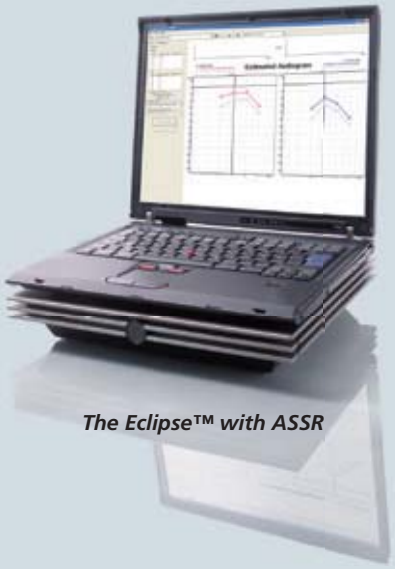
OtoRead™ Handheld OAE

Middle ear analyzers:

- AT235 Middle Ear Analyzer
- AT235h Middle Ear Analyzer
- MT10 Handheld Tympanometer

Audiometry and Middle Ear Analyzer in one:

- AA222 Audio Traveller



The Eclipse™ with ASSR

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