MADSEN® Astera²



Full range of tests

- LIPread™
- Pediatrics
- Tinnitus
- TEN Test
- Békésy
- QuickSIN™
- ABLB
- SISI
- Stenger
- Tone Decay
- Multiple Frequency Weber
- Masking level difference (MLD)
- High frequency 20 kHz
- Lüscher/DLI (Difference Limen Intensity)

Excellence in audiometry

The MADSEN Astera² is a state-of-the-art clinical audiometer that enables you to work with precision and flexibility, whether you practice in a major health care facility or a one-person office. It combines the best features of traditional, stand-alone audiometers and newer PC-based systems so you can store, share and report all data in our OTOsuite software universe or integrate directly with NOAH and Electronic Medical Records.

More intuitive. More possibilities.
The goal for the new MADSEN Astera² was to improve the functionality and introduce groundbreaking new assessment tools into daily audiometry. The result is a new and refined clinical audiometer with dedicated test modalities for pediatrics, LIPread™ and tinnitus. In addition to this, new features such as Click'n'Get™ and Score'n'Store™ makes it easy to stay focused on the patient. You have the choice of operating the audiometer either through the intuitive Sunshine™ interface optimised for touch screen, the Audiometer Control Panel or the PC keyboard or mouse depending on your preference.

Future-proof design
The MADSEN Astera² is durable, comfortable and future-proof. Not only will users receive software upgrades for the life of the equipment, the Astera² is ready to meet future requirements of EMR (Electronic Medical Records) by incorporating standard data-transfer protocols.

OTOsuite®

Easy integration with other processes for seamless workflow
The MADSEN Astera² is part of the OTOsuite universe which means the audiometric workflow easily integrates with the immittance and fitting testing processes. This allows you to perform audiometry, fitting, counseling and verification in a seamless workflow. One-click data logging, combined immittance and audiometry reporting contribute to a more efficient testing process and help eliminate paperwork.

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MADSEN® Astera²

Technical specifications:

MADSEN Astera²	
Channels	
Two separate and identical channels	
Frequency range	
TDH39 earphones:	Standard frequencies: 125 - 12500 Hz
HDA 200 earphones:	Standard frequencies: 125 - 20000 Hz
Otometrics insert earphones:	Standard frequencies: 125 - 8000 Hz
BC:	Standard frequencies: 250 - 8000 Hz
SF:	Standard frequencies: 125 - 20000 Hz
FRESH noise stimulus*:	125 - 20000 Hz
NBN masking:	Available in entire frequency range
* *Range may be limited by choice of transducer*	
Frequency resolution	
1/6, 1/12, 1/24 and 1/48 octave as well as 1 Hz (You can store up to 24 points for each audiometry curve)	
Level range	
Maximum output will be limited by the transducer	
AC:	-10 to 120 dB HL (500 to 4000 Hz; supra-aural earphone)
BC:	-10 to 80 dB HL (1500 to 3000 Hz; mastoid placement)
SF:	105 dB HL (Note: with external amplifier)
Level accuracy	
Entire level range (AC):	125 to 5000 Hz: ±3 dB
	5000 to 20000 Hz: ±5 dB
Entire level range (BC):	250 to 5000 Hz: ±4 dB
	5000 to 8000 Hz: ±5 dB
Level resolution	
1, 2, or 5 dB step resolution over the entire range	
Stimulus types	
Tone	
Warble	
Pulsed tone	
Pulsed warble	
FRESH noise (FREquency-Specific Hearing assessment noise)	
Pulsed FRESH noise	
Stimulus presentation	
Normal:	The signal is presented when the Stimulate button is pressed
Continuous ON:	The signal is interrupted when the Stimulate button is pressed
Pulse:	The signal is pulsed
Pulse duration:	225 ms on and 225 ms off (default).
Masking types	
Narrow Band Noise	
• AC and BC	Correlated
• SF	Non-correlated[a]
Speech Weighted Noise	
• AC and BC	Correlated
• SF	Non-correlated[a]
White Noise (Wide band noise)	
• AC and BC	Correlated
• SF	Non-correlated[a]
(a) A maximum of 3 non-correlated simultaneous masking signals	
Stimulus modulation	
FM (Warble):	Adjustable modulation rate and depth:
	Modulation rate: 1-20 Hz (default: 5 Hz)
	Modulation depth: 1-25% of center frequency (default: 5%)
SISI:	5, 2, 1 dB increments
Special tests	
TEN Test, QuickSIN (optional), SAL Test, MLD, ABLB, SISI, Weber, Rinne, Stenger, Tone Decay, Tinnitus, LIPread™ (CUNY, MLST-C/A) (optional), Pediatric (optional), Békésy, DLF, DLI, HLS, MHA, Multiple Frequency Weber	
Total harmonic distortion	
Air < 2.5 %	
Bone < 5 %	
Selectable transducers	
AC:	TDH39, HDA 200, and Otometrics insert earphones
BC:	B71 (Mastoid / Forehead)
SF:	Passive sound field speaker, using the built-in amplifier in MADSEN Astera², or Sound field speaker with built-in amplifier or external amplifier, with both types using the line output from MADSEN Astera²

(Transducer options depend on how MADSEN Astera² is ordered and calibrated)

Outputs	
AC:	3 x 2 mono jacks, 1/4 "
BC:	2 x mono jacks, 1/4 "
SF power output:	5 x terminals,
	5 x 40 W peak, 8Ω load
SF line output:	3 x min XLR 6 pin
	(for 5 x balanced line outputs)
External inputs	
CD/Analog line in:	0.2 to 2.0 Vrms, 10 kΩ 2 x RCA phone
Talk Back microphone:	Electret microphone
Input voltage:	0.002 to 0.02 Vrms
Input resistance:	2.21 kΩ.
	3.5 mm jack
USB port connector	
Type:	USB device port
Interface:	USB 2.0
Speed:	Full-speed (12 Mb/s)
Dimensions	
Approx. 325 x 255 x 60 mm (12.8 x 10 x 2.4 inches)	
Weight	
Approx. 1.3 kg (2.85 lb)	
Power supply	
External power supply, type:	
Delta Electronics, Inc.	Output: 24 V, 3.75 A
	Input: 100-240 V, 50-60 Hz
Standards	
Audiometer:	EN60645-1, Type 1, EN60645-2 Type A-E, ANSI S3.6
Patient Safety:	Complies with IEC 60601-1, Class 1, Type B; AAMI
	ES60601-1; CSA C22.2 NO. 60601-1-08-CAN/CSA
EMC:	IEC 60601-1-2

Audiometer Control Panel

USB port connector	
Type:	USB device port
Interface:	USB 2.0
Speed:	Full-speed (12 Mb/s)
Dimensions	
Approx. 410 x 290 x 36 mm (16.1 x 11.4 x 1.4 inches)	
Weight	
Approx. 2.1 kg (4.6 lb)	
Power supply	
No external power supply. Supplied by the USB (5 V)	
*(If you are using a USB hub, use a **powered** USB hub)*	

PC System Requirements

- 1.5 GHz processor or higher (2 GHz recommended)
- 1GB RAM (2 GB recommended)
- 2.5 GB free disk space for installation of the OTOsuite software. Additional disk space is needed for installation of prerequisites.
- Windows XP Professional SP3 (X86), Windows 7 Professional (X64), Windows 7 Professional (X86 / 32-bit), Windows 8 Professional (X64)
- USB port for connectingaccessories, v.1.1 or higher (v.2.0 or higher for OTOcam 300)
- DVD drive
- 32 bit color display, 1024x768 screen resolution
- 128 MB graphicmemory
- Windows-compatible sound card
- If required, NOAH 3.5.2, NOAH 3.5.2 for ENTs, or higher, or NOAH 4 or NOAH 4 for ENTs, for NOAH mode operation.

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