

**Technical specifications:**

**Channels**

Two separate and identical channels

**Frequency range**

FRESH noise stimulus*:	125 - 12500 Hz
Insert phones:	Standard frequencies: 125 - 8000 Hz
TDH39:	Standard frequencies: 125 - 12500 Hz
HDA 200 phones:	Standard frequencies: 125 - 20000 Hz
BC:	Standard frequencies: 250 - 8000 Hz
SF:	Standard frequencies: 125 - 20000 Hz
Frequency resolution:	1/6, 1/12, 1/24 and 1/48 octave as well as 1 Hz**
NBN masking:	Available for each stimulus frequency

\* Range may be limited by choice of transducer

\*\* You can store up to 24 points for each audiometry curve

**Stimulus types**

- Tone
- Warble
- Pulsed tone
- Pulsed warble
- FRESH noise (FREquency-Specific Hearing assessment noise)
- Pulsed FRESH noise

**Masking types**

Narrow Band Noise	
• AC and BC	Correlated
• SF	Non-correlated <sup>(a)</sup>
Speech Weighted Noise	
• AC and BC	Correlated
• SF	Non-correlated <sup>(a)</sup>
White Noise (Wide band noise)	
• AC and BC	Correlated
• SF	Non-correlated <sup>(a)</sup>

<sup>(a)</sup> 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**

MLD, ABLB, SISI, Weber, Rinne, Stenger, Tone Decay, Tinnitus tests

**Accuracy of sound level**

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

**Attenuator**

1, 2, or 5 dB step resolution over the entire range

**HL 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:	102 dB SPL in a 6' by 6' or 2 x 2 m sound room

**Total harmonic distortion**

Air	< 2.5 %
Bone	< 5 %

**Selectable transducers**

AC:	TDH39, HDA 200, and Insert phones
BC:	B71 (Mastoid / Forehead)
SF:	Passive sound field speaker, using the built-in amplifier in MADSEN Astera, or Sound field speaker with built-in amplifier or external amplifier, with both types using the line output from MADSEN Astera

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

**Outputs**

AC:	3 x 2 mono jacks, 1/4 "
BC:	2 x mono jacks, 1/4 "
SF power output:	4 x terminals, 4 x 40 W peak, 8Ω load
SF line output:	4 x RCA phone, 4 x 1.6 Vrms,

**External inputs**

CD/Tape:	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

**Stimulus presentation**

Normal:	The signal is presented when the <b>Stimulate</b> button is pressed
Continuous ON:	The signal is interrupted when the <b>Stimulate</b> button is pressed
Pulse:	The signal is pulsed
Pulse duration:	200 ms on and 200 ms off

**USB port connector**

Type:	USB device port
Compliant:	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 supplies, type:	
Output:	24 V, 3.75 A
Input:	100-240 V, 50-60 Hz, 1.0 A

**Standards**

Audiometer:	EN60645-1, Type 1, EN60645-2 Type A-E, EN60645-4, and ANSI S3.6
Patient Safety:	Complies with EN 60601-1, Class 1, Type B; U2601-1; CAN/CSA-C22.2 NO 601.1-90.
EMC:	EN 60601-1-2

**Audiometer Control Panel**

**USB port connector**

Type:	USB device port
Compliant:	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**

- Pentium 4, 1.5 GHz
- 1 GB RAM
- 32 MB graphics adapter, 32 bit color
- 3 GB free disk space for installation of this software
- Windows XP Professional SP1, Windows 2000 SP3 or Windows Vista
- Internet Explorer 6 Service Pack 1
- A USB port for connection of the accessories
- NOAH 3.1™ or higher for NOAH mode operation (please refer to HIMSA at [www.himsa.com](http://www.himsa.com))

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It's familiar. Just more...

## Benefits



### Fast testing

The full function Astera Audiometer Control Panel ensures high speed of operation throughout the testing process.

### Familiarity and comfort

The ergonomic and familiar design of the Audiometer Control Panel provides a test setup that you know and trust and makes the testing process extremely comfortable.

### Save your favorite user tests

With the Astera, setting up for tests is faster than ever since you can create, save and recall your preferences for the ideal testing scenario at the push of a button.

### Ideal for pediatric testing

Features such as multiple speaker routing, FRESH (FREquency Specific Hearing assessment) noise and talk-to-assistant functionality, support the pediatric testing process. Channel Specific Threshold Storing lets you measure both ears at the same time and yet store the results separately.

### Exceptional amplification

The built-in internal power amplifier enables you to perform sound field testing at 90dB HL without an external amplifier – saving your clinic both money and space.

### Total routing flexibility

The true two-channel layout of the software and Audiometer Control Panel give testers full routing flexibility making test setup simple and efficient.

### The power to do it all

The Astera's full featured clinical test battery gives you the freedom to perform every type of test necessary in a clinical setting.

### Uninterrupted communication

A custom-made monitor headset and Talk-forward/Talk-back microphones, and a talk-to-assistant communication system, ensure clear communication throughout the testing process.

### Speech testing – your way

Integrated word lists in the speech testing module ensure more efficient testing. With the Astera, you see the words on the PC monitor and can set up the speech testing the way you like, so you can choose to present only certain words, use half lists, score phonemes etc.

### Focus on what matters

One-click data logging lets you eliminate pen and paper from the testing process – this means a more efficient workflow, better data handling and more time with your patients.

### Personalize your view settings

The Astera allows you to choose your favorite view settings, including the option of graphical or tabular view of speech results, giving you a good overview while testing.

### Save your data anywhere

With the Astera it's possible to save data directly on your PC, in NOAH, or in a third party EMR system.

### Fast and easy reporting

Print data on a wide variety of reports, including overlays and a combined immittance and audiometry report. This makes documentation fast and easy – and enables you to easily share data with others.

### Small footprint

As if it wasn't small enough already, the audiometer hardware can easily be mounted on the wall, to take up even less space in the clinic.

### Enhanced workflow with OTOSuite

Because the Astera audiometer is an integrated part of the OTOSuite universe, it gives you many opportunities to make your workflow more efficient – and even go paperless. OTOSuite combines individual diagnostic and fitting tools in one software and enables you to move seamlessly from one audiometric process to another.

Read more about OTOSuite on [www.myaudiometer.com](http://www.myaudiometer.com)