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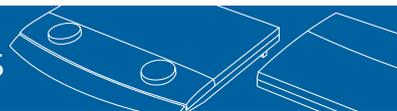| The NEW speech test modality	Description	Advantages	Benefits
2-channel binaural speech	Full 2-channel flexibility.	You can compensate for asymmetry in the hearing loss and test the patient's full capability. You can present and store the speech stimulus to both ears at independent levels at the same time.	• Accuracy • Flexibility
Score'n'Store™	Store and review complete word list results for all speech tests including QuickSIN and LIPread™.	Everything you see on the speech screen is stored and can be reviewed and printed at anytime.	• Better knowledge of the patient case and progress • More professional follow up
Integrated speech list name stored with the data	The name of the list is stored with the speech data and is accessible on the GUI and the report.	Full documentation related to the speech material used for the measurement.	• Professional • Comfortable • Completed
Intelligent speech table (Click'n'Get™)	Clicking a predefined speech test in the speech table automatically adjusts the settings and selects the relevant speech list.	All the speech tests you perform on a daily basis is instantly available.	• Efficient • Comfortable
Customizable layouts	The user can modify or customize the layout of the table in relation to the work flow of the clinic by right clicking and moving up or down the row (e.g. SDT, WRS, L or R etc.)	You can predefine a consistent table layout which makes the review extremely efficient for you as well as the referring physician. A predefined table reveals what has been tested. All the speech tests you perform on a daily basis is instantly available.	• Efficient • Comfortable
Data sorting	The speech table can be sorted by columns and you can easily get back to your starting point based on the Excel sheet sorting model.	You can easily view and compare the speech data in different ways, e.g. sorted by ear, by test type, by aided condition etc.	• Professional • Efficient • Flexible
Add comments to any test	The operator can write comments in the "info field" for each measurement.	Any event or specific circumstances that may have influenced the measurement can be noted for future reference. E.g. a patient with a different language skill can be reported directly on the test. Also if the list could not be completed due to e.g. fatigue this can be noted.	• Professional • Accurate
Speech line output (More than 105 dB HL)	The audiometer delivers a balanced noise free line output. The hardware has 3 mini XLR connectors providing a 5 balanced outputs. External amplifiers are required.	The 5 balanced output can be amplified immensely (up to 105 dB HL in a 3mx3m sound booth) for extreme output level and still comply with low level output standards.	• Powerful
Speech power output (96 dB HL)	Potent built-in amplifiers (5x40 Watts)	Reduces the need for external hardware and still accomplishes high noise free output levels (up to 96 dB HL in a 3mx3m sound booth with the provided loudspeakers).	• Ergonomic • Economic • Modern • Flexible • Powerful
Specific phoneme scoring (Score'n'Store™)	Click on individual phonemes to score them as correct or incorrect directly on the word displayed on the screen.	You can easily score and review phonemes recognition without the use of pen and paper.	• Environmentally friendly • Modern • Ergonomic • Economic
Comprehensive playing and scoring options	A collection of options (options dialogue) for scoring and playback preferences.	You can tailor your speech test score and play based on your individual preferences, e.g. continuous play back, play on count, and counting correct, incorrect, phonemes, sentences, number of words etc.	• Professional • Efficient • Flexible • Traditional • Comfortable
Automatic SNR calculation	An option to automatically store the difference between the noise and stimulation output levels as Signal to Noise Ratio (SNR).	Allows the operator to set, store and document the speech in noise test conditions in an intuitive way.	• Professional • Efficient • Comfortable

MADSEN Astera² - Features, Advantages & Benefits

Sunshine™ control panel	Description	Advantages	Benefits
Alternative control panel	A new control panel is introduced with MADSEN Astera² as an alternative to the original one. This new control panel is refined for standard audiometry and optimized for touch screen. The new design offers another way to control Astera² through OTOsuite with all the existing settings available.	A more visual and clean access to the different settings. The Sunshine™ mode offers large icons and pictures illustrating the transducers, tests, ears etc. This layout is touch screen friendly. It has been designed to be more intuitive and require less training.	• Easy to use • Efficient • Comfortable • More professional with the touch screen • Modern
Large icons	New icons have been implemented with Sunshine™ to reach the standard representations used in audiology to show transducers or signals. These large icons are easily reachable and can be customized in the way they are displayed.	These large icons are easily recognizable and familiar to the clinicians. The size of the icons has been optimized for a comfortable touch screen navigation.	• Easy to understand • Comfortable to use • Touch screen friendly
Customization	The way the icons are displayed or the number of icons can be adjusted by the user.	Customization offers more freedom for the clinician to design the control panel to his/her own needs thereby making the control panel more familiar.	• Efficient • Familiar
Right click function	The right click function is known by PC users as the possibility to reach more commands by a single click. This possibility has been implemented in Sunshine™ through the right click of the mouse or through the touch screen by touching the icon. The right click displays a window next to the icon offering the opportunity to customize the control panel, to adjust the number of settings available and or to use the cycle button option.	This right click feature is provided for unlimited operations beyond standard audiometry.	• Efficient • Familiar
User test access	User tests are predefined setups for performing tests without manually changing the settings. In the traditional control panel the user test feature is accessed by clicking the specific icon in the tool bar. The Sunshine™ control panel offers a direct access to this function.	The icon located in the Sunshine™ control panel provides a clear and easy access to this feature.	• Efficient • More test/less settings
Tone, speech and pediatric audiometry	The Sunshine™ control panel is available for tone, speech and pediatric test modalities.	The operator can use Sunshine™ in the most used test modalities.	• Efficient • Comfortable • Professional • Safe
Intelligent choice of transducers	When using the masking function the cycle button automatically selects the right masking transducer based on the one used during the threshold assessment. E.g. if the THR has been performed with the inserts, the masking button will provide the inserts as the first choice to perform the masking.	The operator does not have to double check the choice of the transducer or to think about setting the masking conditions.	• Efficient • Comfortable • Intuitive • Ergonomic
Cycle buttons technology	The cycle button technology is typically the technology used in the touch screen application. One single button can propose several possibilities by clicking the choice of transducer, ears etc. The choice offered by the cycle button can be adjusted by right clicking.	The user can obtain an uncluttered control panel by reducing the number of buttons. E.g. the transducer button can select the TDH, HDA 200, inserts, SF, SFA, SFA1.	• Ergonomic • Comfortable

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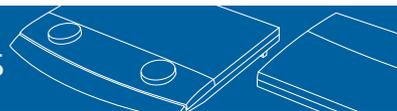
Tinnitus test modality	Description	Advantages	Benefits
Tinnitus matching	Tone, warble, FRESH, NBN and WN available as signals in high frequency resolution down to 1 Hz steps. Change octave up and down from any frequency at a single mouse click. 1, 2 and 5 dB for loudness matching optionally expressed in dB SL. Tone audiogram presents tinnitus markers. The tinnitus matching data is stored in a table independent of the signal routing.	You can perform all established tinnitus matching tasks to describe the patient's tinnitus pitch (including octave confusion) and loudness.	• Fast and accurate • Minimize human error • Save energy • Focused on the task
Minimum masking level	Dedicated data storage for Minimum Masking Level (MML) as well as predefined descriptors (Complete, Partial, None and Exacerbation). Optionally expressed in dB SL.	You can record and describe the tinnitus maskability. It gives an indication for the appropriate management.	• Professional • Focused
Residual inhibition	The residual inhibition player presents the noise for 1 minute and then measures how long it takes for the tinnitus to return. It also contains a predefined characterization (Complete, Partial, Reduced, Absent).	You can easily manage noise presentation and timing as well as the patient's response to perform a residual inhibition. The result is automatically stored in the table.	• Focused • Fast and convenient • Minimizes human error
Questionnaires with automatic classification	Tinnitus Handicap Inventory, Tinnitus Functional Index and Tinnitus and Hearing Survey questionnaires are integrated to be filled out on the computer screen or a touch screen. The score is automatically calculated and a predefined description is presented. The data is stored as a separate NOAH questionnaires entry. All the performed questionnaires are listed on the screen with the respective dates and can be clicked for review. They are available in many languages.	Large choice of validated tinnitus questionnaires establishing an in depth classification of the symptom and its impact on the patient life. These questionnaires (THI, TFI and THS) are used to evaluate the necessary level of management. You can view and print the questionnaires in a language different from what was used to fill out the questionnaire. This is particularly useful in multilingual regions. You can also compare results directly on the screen to monitor progress.	• Easy review of records for follow ups • More professional
T report	A dedicated tinnitus report for the psycho-acoustic evaluation. It includes an audiogram with tinnitus markers, a table with pitch and loudness matching, minimum masking level and residual inhibition. The report also includes a tinnitus specific note.	You can visualize and share the tinnitus evaluation data in a focused way.	• Focused • Collaborative • Professional
Historical tinnitus data overview (psychoacoustic and questionnaires data)	All historic tinnitus sessions are readily available in the data view area.	You can monitor progress in the tinnitus management. This feature is helpful for providing counseling and selecting the right tinnitus management program. It also facilitates an outcome measurement.	• Efficient • Individualized

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Pediatric license	Description	Advantages	Benefits
Dedicated test modality	The pediatric test modality is focused on the specific needs and challenges of testing children. It takes the most useful features already introduced in the first generation of MADSEN Astera and adds the specific requirements that have been expressed by pediatric professionals. It contains a clear separation between setting up for the test and performing it. This is accomplished with two different control panels in the same view (one on each side of the screen). Both tone and speech awareness testing can be performed in the same view. The audiogram graph is tailored for the needs by reducing the number of frequencies and the level range to what is actually used in this patient group.	With a single dedicated test modality designed specially for pediatric hearing assessment, the clinician can work with the right tools at the right place in order for her/him to conduct the test by keeping the maximum of attention on the patient behavior, but it also offers the operator a setup which fits the environment instead of adjusting the environment to the new tool, meaning there is no need for parallel routing systems or paper next to the audiometer to notice the uncertainty of the response.	• Efficient • Comfortable • Intuitive • Ergonomic
Integrated VRA control	Settings and activation of the visual reinforcers in the audiometer user interface. It supports any VRA system with IR control. The pediatric package includes an USB to IR adapter.	You can present the stimulus and reinforce the child without moving your hands between different devices and without looking away from the patient. You can reduce the complexity of your hardware setup.	• Efficient • Comfortable • Safe and accurate • Intuitive • Ergonomic
Integrated assistant communication	A specific headset for the assistant to hear what the operator is saying.	The operator and the assistant can collaborate closely without disturbing the child. The mic is integrated reducing the complexity of the hardware by avoiding peripheral communication equipment.	• Ergonomic • Comfortable
2-channel storing	When stimulus is presented through both channels - one to each ear, the two store buttons also become ear specific.	You can alternate between testing the right and the left ears without changing any settings in between. This is of advantage when performing VRA testing.	• Efficient • Comfortable • Intuitive • Ergonomic
Pediatric Sunshine™	Two different control panels located to each sides of the screen. The first panel (also available as classic mode) handles all settings and the second panel handles stimulation, reinforcement and storing responses. The Sunshine panels have large buttons.	You can operate both the audiometer and the VRA system on the same touch screen. The intuitive control panel separation lets you focus on the patient.	• Efficient • Comfortable • Intuitive • Ergonomic
Special ACP function buttons	Dedicated ACP buttons for left/right/center VRA as well as tracking of responses (√, ?, ÷).	All necessary functionalities at your finger tips allows the user to quickly alternate between presenting stimulus and reinforcing.	• Efficient • Comfortable • Intuitive • Ergonomic
FRESH (FREquency Specific Hearing noise) stimulus	Alternative NBN stimulus with steep filter slopes. This stimulus has been developed by NAL in the early 1980's.	Allows you to alternate between different equally valid stimuli in order to keep the child's interest. Replaces the use of the NBN masking signal (not frequency specific). FRESH noise is narrow enough to also measure sloping hearing losses.	• Accurate • Efficient
Frequency specific warble	Customizable warble rate and width for each audiometric frequency.	You can optimize your warble rate for your sound field to decrease the risk of standing waves. You can also create warble tones that are more interesting to a child.	• Accurate • Efficient
Silent mode	A mouse-over control for level and presentation buttons.	It allows the operator to silently control the audiometer when in the same room as the patient.	• Efficient
Storing of audiometry method (Play, VRA, and BOA etc.)	The method of collecting the audiogram can be stored and printed with the data.	The user can easily report the hearing test in a consistent way.	• Efficient • Comfortable
Counseling overlays	Visual cues (severity scale, unusable area, pictures, speech banana, speech letters) offering different ways to interpret or describe the hearing loss.	It supports the counseling part which is important during the pediatric assessment. These overlays would help the operator communicate or adjust the communication to the parents.	• Professional • Focused
Pediatric report	A dedicated pediatric template report: 1. Pediatric tone + SDT + Tymp + reflex screening 2. Pediatric tone + SDT	The users have a specific report related to the pediatric performed into the pediatric test modality. The template shows large audiograms with tracking responses* (see below for more information) and SDT (Speech Detection Threshold). There is one combined report for integrated middle ear measurements using the OTOflex. It allows the user to communicate the results in a professional and clear manner.	• Professional • Focused
SDT speech awareness testing	Uses live voice through a microphone stimulus selection next to tone, warble and FRESH. SDT data is integrated in the pediatric tone audiogram as well as the report.	The operator can quickly estimate the patient's hearing capability as complement (or alternative) to the tone responses.	• Professional • Efficient • Flexible
Tracking of responses	Each response, either positive, negative or ambiguous can be stored and shown in the audiogram.	The different symbols in the audiogram let you monitor the test progress so you can alternate between different frequencies, levels and ears to keep the child's interest and still collect all necessary test data. Furthermore, as the threshold for children is not always precise the tracking of responses allows you to visualize the area of the patient's hearing.	• Efficient • Comfortable • Professional • Safe

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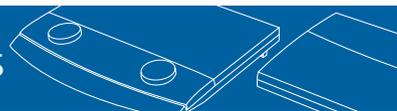
LIPread™	Description	Advantages	Benefits
HD video	The LIPread™ speech player can present video speech material in three different modes: Audio, Audio+Video or Video. By pressing 'Play' a single test item will be shown (typically a sentence). The Video is presented to the patient on a second monitor connected to the PC.	You can assess the patient's capability to understand speech and the impact of the addition of visual cues. The addition of visual speech cues such as the movements of the lips, tongue and facial expression has very different impact on different people's capability to understand speech. The LIPread™ data is used to assess progress, habilitation/rehabilitation and guide the clinical intervention.	• Precise • Consultative • Professional • Unique and relevant
MLST (children and adults)	Clinically validated LIPread™ material in American English developed by Dr Karen Kirk and co-workers at the University of Iowa, House Ear Institute, Children's Memorial Hospital Chicago, Washington State University and VA Mountain Home TN. The material has been carefully designed and composed to a high degree of list equivalency regardless of presentation mode. Otometrics has exclusive rights to audiometric SW/Audiometer integration.	Proven list and sentence equivalency is necessary to compare measurements made using different sentences and different amplification conditions on different occasions.	• Trustworthy • Clinically relevant • Well referenced for support • Modern
CUNY	British Audio-Video version of the classic CUNY speech material originally developed by Dr Arthur Boothroyd at City University of New York.	Well established material that is in clinical use in cochlear implant centers in the United Kingdom.	• Trustworthy • Clinically relevant • Well referenced for support
Full patient history	The LIPread™ data is presented in a table with individual time stamps on each measurement. All measurements available for the selected patient are always displayed in the table. Also, the actual list and detailed score is displayed on the screen and in the reports.	The data is available which allows for comparison over time. This is particularly important when testing cochlear implant patients since the typical protocol includes measurements starting before implantation and ending a couple of years after the implantation with several measurements at different points in time in between.	• Professional • Efficient • Intuitive
Score'n'Store™	*) See Speech Test Modality section		
Automatic SNR calculation	*) See Speech Test Modality section		
Dedicated loudspeaker outputs for LIPread™	The Astera² supports up to five loudspeaker outputs that can also be given names in the user interface.	For LIPread™ testing which requires a video stimulus monitor for the patient, the setup of the monitor is not always optimal next to the regular audiometer loudspeakers. Hence the large number of loudspeaker outputs allow for dedicating a loudspeaker to mount together with the monitor screen to use specifically for LIPread. These multispeaker options also allow for testing with stimulus from the front and competing noise from behind which is very powerful assessment/demonstration. Naming the speakers also makes the user interface simple to navigate.	• Comfortable • Professional • Unique and relevant • Efficient • Intuitive

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MADSEN Astera² - Features, Advantages & Benefits
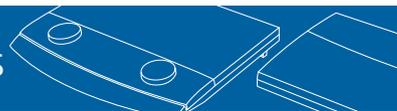
Various improvements	Description	Advantages	Benefits
Frequency specific warble	Warble tones where the rate and width are configurable per frequency with optional warble tones. Table provided based on H. Dillon article	To offer more stimulus variations under headphones and/or higher accuracy in SF	• Higher accuracy
Smile™	Configuration of view and controls to appear on either side of the screen/ACP	The operator can select the layout of left and right the way he/she prefers	• More user-friendly • More convenient • More ergonomic • Less errors • More efficient
Renaming all speakers in options	Configurable names for all speakers	You can make the user interface reflect your protocol	• More user-friendly • What you see is what you get • It fits your methods
Configurable masking assistant	Configuration of interaural attenuation values per transducer and frequency	Will follow your own masking criteria and fit into your working methods	• No surprises • High level of convenience and trust • Efficient • Fits the interpretation of both the operator and the physician
10 down/5 up	Configuration the attenuator to increase the level by 5 dB and decrease by 10 dB	The audiometer assists the operator to perform the modified Hughson/Westlake method of hearing testing	• More convenient
Swap ear data	You can shift the data across the ears for either a single curve or all measurements at once	You do not have to redo the test if you have placed the headset incorrectly	• Save time • More convenient • Save both your own and your patient's energy • Look more professional
Browse for user tests	You can load user tests from different PC directories inside the Tools -> Options file menu	You can easily add a new user test from another work station	
Printing overlays w/audiograms	You can print your audiograms as shown on the screen including the selected counseling overlays	You can create a counseling printout for the patients	• Better communication • Better counseling

Hardware & FW changes	Description	Advantages	Benefits
Pediatric ACP controls	VRA controls enabled with the pediatric test modality	You can present the visual reinforcers right next to your stimulus presentations controls	• Speed • Comfort • Less cluttered workspace • Always at your finger tips
5th speaker	The 5th speaker output is activated	More routing options You can tailor your sound booth to accommodate different test protocols (localization, CI, LIPread™ etc.)	• More advanced practice • Customizable setup
Clearer visibility of channels selection	The channels selection is intuitively marked with a blue line	You can clearly see which buttons control the two independent channels	• More intuitive navigation • Less cluttered user interface • Faster access
More than 105 dB HL	Eliminated noise on the line outputs. Line out is now using three XLR connectors	The audiometer delivers a balanced noise free line output. The hardware has 3 mini XLR connectors providing a 5 balanced outputs. External amplifiers are required.	• Test at extreme output levels