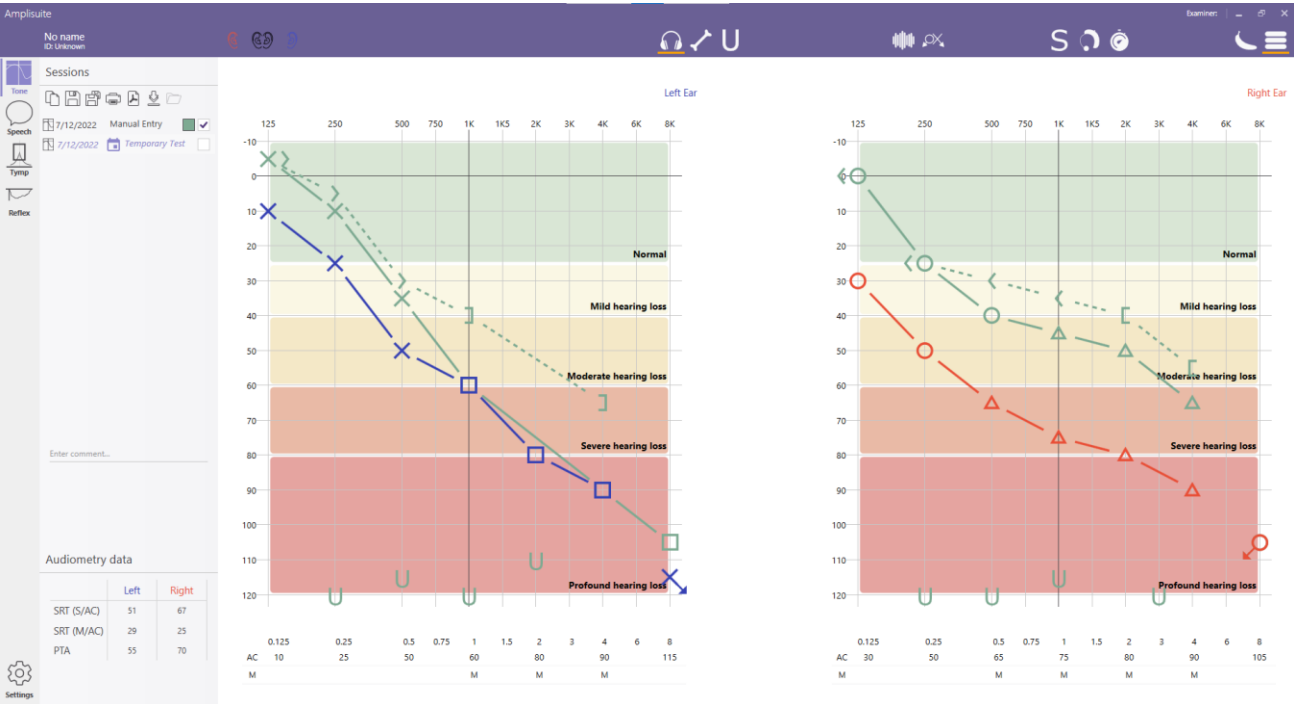


Amplisuite

INSTRUCTION FOR USE



ABOUT THIS MANUAL

READ THIS OPERATING MANUAL BEFORE ATTEMPTING TO USE THE INSTRUMENT.

This manual is valid for the Amplisuite (from firmware version 2.0 onwards).

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TABLE OF CONTENTS

1. INTRODUCTION	4
1.1. THANK YOU	4
1.2. INTENDED APPLICATIONS	4
1.3. DISCLAIMER	4
2. AMPLISUITE INSTALLATION	5
2.1. PRE-INSTALLATION NOTES	5
2.1.1. PC and system Requirements	5
2.1.2. Operation system Compatibility	5
2.2. INSTALLATION	5
2.2.1. General	5
2.2.2. Amplisuite installation package (Stand-Alone Module)	5
2.2.3. USB Driver Installation	9
3. AMPLISUITE	10
3.1. STARTING AMPLISUITE (STAND-ALONE MODULE)	10
3.2. STARTING AMPLISUITE (NOAH MODULE)	10
3.3. STARTING AMPLISUITE (OTOACCESS MODULE)	10
3.4. CHANGING THE LANGUAGE	11
3.5. SWITCHING BETWEEN MODULES	11
3.6. OVERALL FUNCTIONS	12
3.6.1. Add Patient and examiner TEst Details	12
3.6.2. Adding session comments	13
3.6.3. Saving a test	13
3.6.4. Changing session date	13
3.6.5. Updating Amplisuite	13
4. AUDIOMETRY MODULE	15
4.1. GENERAL	15
4.2. OVERALL FUNCTIONS	15
4.2.1. Download Results from device	15
4.2.2. Start auto test with Otosure or PC850	15
4.2.3. Ear Side Selection	15
4.2.4. Printing and PDF storage	16
4.3. TONE AUDIOMETRY MODULE	17
4.3.1. General	17
4.3.2. Selection of AC, BC, FF and UCL	17
4.3.3. Counseling Overlays	18
4.3.4. Entry of Data	19
4.3.5. Masking	20
4.3.6. No Response	21
4.3.7. Aided	21
4.3.8. Delete a test point	22
4.3.9. Audiometry Data calculation	22
4.4. SPEECH AUDIOMETRY MODULE	22
4.4.1. General	22
4.4.2. Selection of AC, BC and UCL	23
4.4.3. Single Syllabic and multi syllabic thresholds	23
4.4.4. Entry of Data	24

4.4.5.	Masking	24
4.4.6.	No Response	24
4.4.7.	Delete a Test point	24
4.4.8.	SRT calculation	25
4.5.	BASILINE COMPARISON	26
4.6.	AUDIOMETRY SETTINGS	27
4.6.1.	General	27
4.6.2.	Position of ear side specific audiogram	27
4.6.3.	Audiogram Icon Set	27
4.6.4.	PTA calculation	28
4.6.5.	Show PHL and NIHL	28
4.6.6.	Speech normative curves	28
4.7.	TROUBLESHOOTING AUDIOMETRY	29
5.	ADMITTANCE MODULE	30
5.1.	GENERAL	30
5.2.	OVERALL FUNCTIONS	30
5.2.1.	Open Test result(s) from PC	30
5.2.2.	Download Results from device	30
5.2.3.	Printing and PDF storage	32
5.2.4.	Zoom in and out	33
5.3.	TYMPANOMETRY MODULE	34
5.3.1.	General	34
5.3.2.	Tympanometric Test results	34
5.3.3.	Assign Curve type (Jerger)	35
5.3.4.	Baseline mode	36
5.4.	ACOUSTIC REFLEX MODULE (ART)	37
5.4.1.	General	37
5.4.2.	Acoustic Reflex Test results	37
5.5.	ADMITTANCE SETTINGS	39
5.5.1.	General	39
5.5.2.	Storage Location	39
5.5.3.	Normative Boxes tympanometry	39
5.5.4.	Acoustic Reflexes	40
5.6.	TROUBLESHOOTING ADMITTANCE	40
6.	SETTINGS	41
6.1.1.	General	41
6.1.2.	ABOUT	41
6.1.3.	General	41
6.1.4.	HELP	42

1. INTRODUCTION

1.1. THANK YOU

Thank you for using Amplivox Amplisuite. Amplivox Amplisuite is a software application that allows results to be uploaded from an Amplivox instrument to a computer via a USB port, viewed graphically and then printed. Amplisuite can be used with audiometers and immittance systems.

Amplisuite is easy-to-use software, that can work as a standalone software or can be integrated into different EMR systems such as Otoaccess and Noah databases.



Please note: Results can only be uploaded from Amplivox audiometers that incorporate the PC compatibility feature.

1.2. INTENDED APPLICATIONS

The software is intended to be used as an accessory with compatible hearing testing devices to manage audiometric data.

Amplisuite software can display audiometric test results from the screening audiometer models 116, 170 and PC850, as well as the diagnostic instruments 240, 260 and 270. The results that can be uploaded include air conduction thresholds (AC THL), uncomfortable loudness levels (ULL)*, bone conduction levels (BC), masked thresholds (AC and BC) and speech score percentage vs. levels*. Amplisuite can show up to 10 test results at once to make test comparison easier. It also calculates PTA (Pure Tone Average, customizable calculation), SRT and PHL(Percent Hearing Loss) values. Patient and test details can also be entered in the software via the computer or database and then printed with the audiogram data.

* These results can only be uploaded from Amplivox audiometers that incorporate these features.

Tympanometric and acoustic reflex tests saved in the memory of the Otowave Tympanometers can be transferred to a PC via an infrared adaptor (Otowave 102) or a USB connection (Otowave 202 & 302), and then viewed using Amplisuite Tympanograms and reflex traces (both Ipsilateral and Contralateral in the case of the Otowave 202 & 302) can then be displayed in greater detail than on the screen of the Otowave. All the data and traces from both ears are presented on a single screen, allowing easy comparison. Additionally, results may be classified according to the Jerger scheme and the entire record may then be printed.

1.3. DISCLAIMER

Amplisuite is a piece of **freeware** software which Amplivox provides for use in conjunction with supported Amplivox audiometers and tympanometers.

As freeware, Amplivox provides no warranty (implied or otherwise) regarding this software and is not liable for any aspect or consequences of its copying or use on a 3rd-party computer. By downloading and/or running the application, the user accepts these conditions.

2. AMPLISUITE INSTALLATION

2.1. PRE-INSTALLATION NOTES

2.1.1. PC AND SYSTEM REQUIREMENTS

The PC-requirements are as follows:

- Processor: 1 GHz or faster, one or multi-core
- RAM: 1 GB or more
- Available hard disk space: minimum 200 MB
- Resolution: minimum 1378 x 768
- Graphics device: DirectX 9 with WDDM 1.0 or higher driver
- Available 2.0 or 3.0 USB Port

2.1.2. OPERATION SYSTEM COMPATIBILITY

Amplisuite is supported on the following Microsoft Operating Systems:

- Windows 10
- Windows 11

2.2. INSTALLATION

2.2.1. GENERAL

Installation is a straightforward process, but the steps must be carried out in the correct order. To ensure you are familiar with the instructions please read this entire user manual before commencing installation.

During Amplisuite installation you may select which of the following versions will be installed on your PC

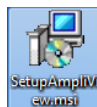
- Stand-alone modules
- Noah modules
- OtoAccess modules



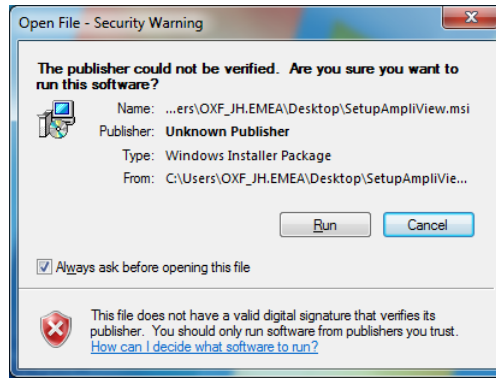
Please note: that when Noah or OtoAccess are being used, this software has to be purchased separately from Amplisuite

2.2.2. AMPLISUITE INSTALLATION PACKAGE (STAND-ALONE MODULE)

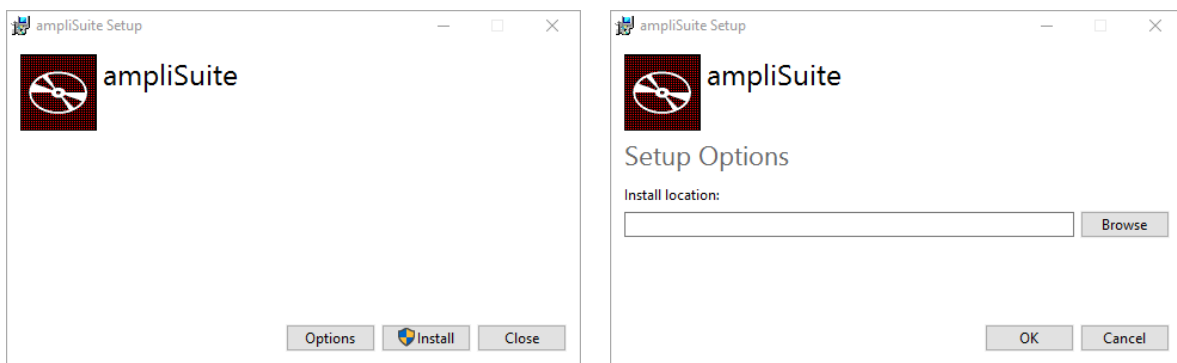
Run **ampliSuiteInstaller.exe**:



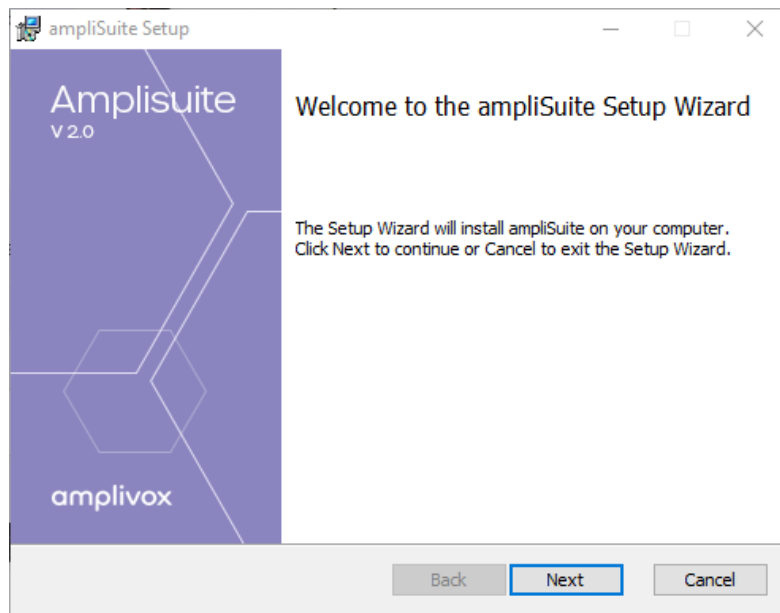
Select **Run** to any security warnings that are displayed:



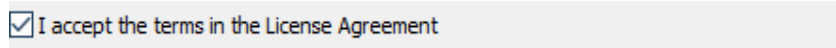
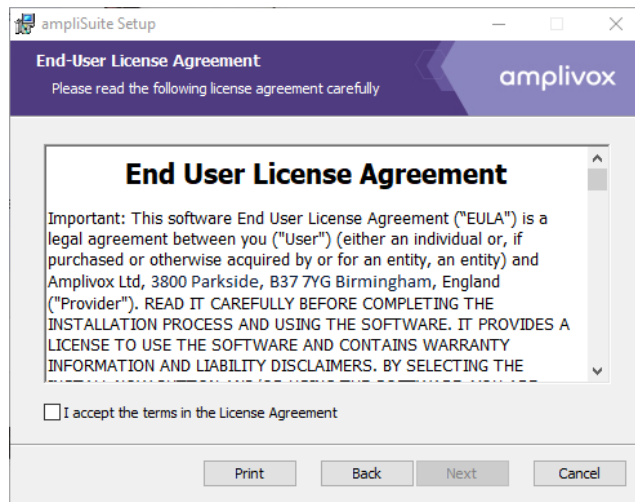
If desired, change the installation location by **Options**. Select **Install** on the welcome screen to proceed with the installation:



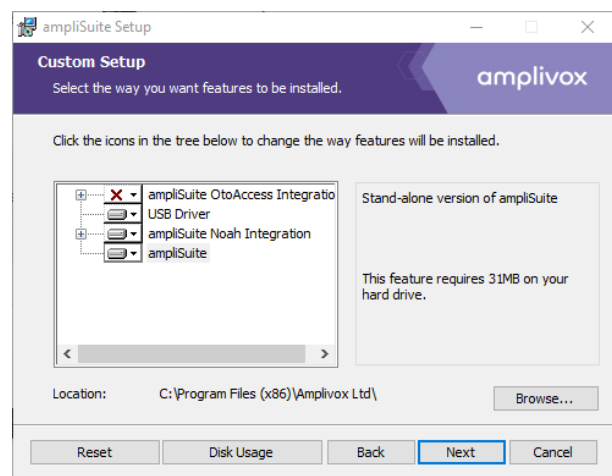
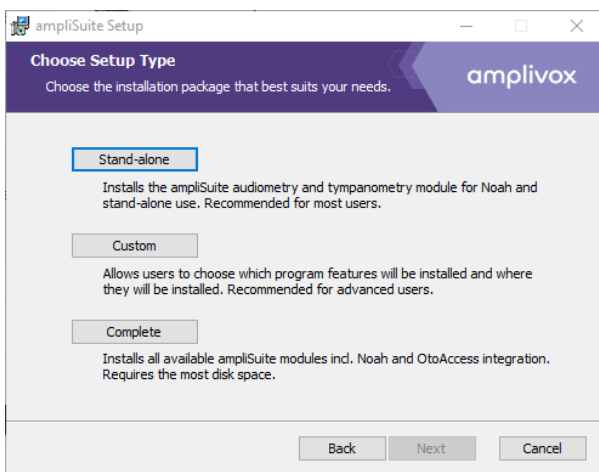
Select **Next** to proceed with the installation:



Read carefully the **end user license agreement**. If you agree with it, select checkbox next to “I accept terms in License Agreement” text and select **Next**. If you don’t agree with the Agreement, select **Cancel** to stop software installation. You can print End-User License Agreement using the Print Button.

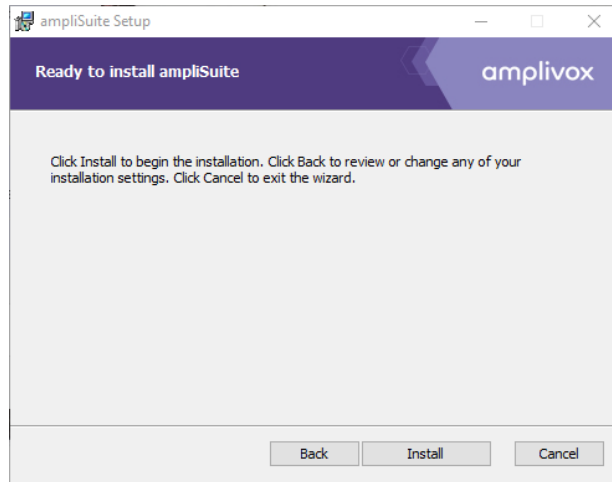


Choose one of the **setup types**. If you select **Typical** or **Complete**, both audiometry and tympanometry modules, as well as Amplivox USB drivers will be installed. Select Custom to manually select what modules you want to install. **Typical Setup** is recommended for most users.

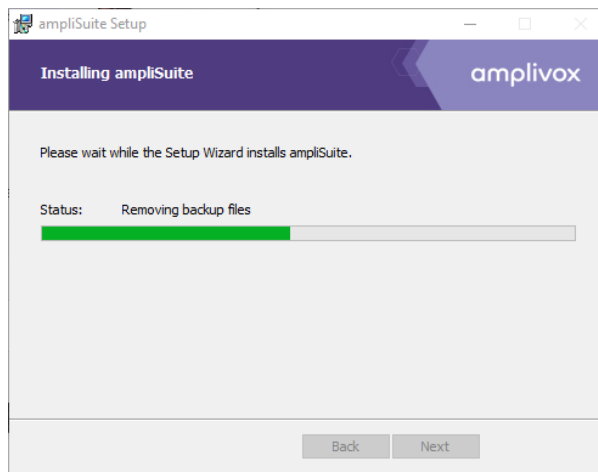


Please note: Noah and Otoaccess must be installed **before** the ampliSuite modules are installed. When installing Amplisuite together with Noah or Otoaccess, please refer to the operating manual of Noah for further installation information.

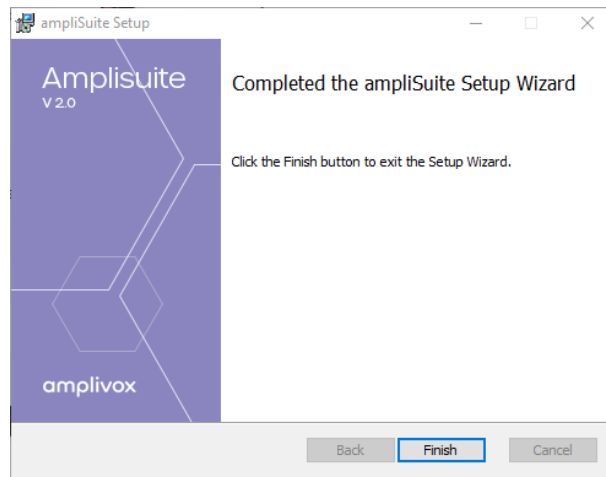
Select **Install** to proceed with the installation:



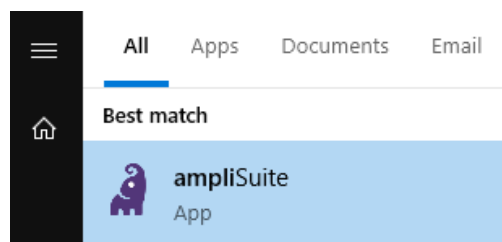
Amplisuite installation will then commence:



Amplisuite installation will continue until complete. Select **Finish**.



To start Amplisuite , select **Amplisuite** from the start menu or the **Amplisuite** icon on the desktop.



The ampliSuite Software can also be started by double-clicking on the **ampliSuite.exe** file. A desktop shortcut to this may be created if desired.

2.2.3. USB DRIVER INSTALLATION



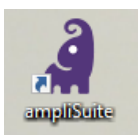
Please note: Make sure that no device is connected to your computer while installing the drivers.

The USB driver installation is part of the Amplisuite installation package. After Amplisuite has been successfully installed, the last window shown will offer the installation of the USB drivers. Select **Finish**.

The installation of the latest drivers is not required if the latest version of the USB drivers are already installed. For example, if an Amplivox instrument has previously been connected to the PC, performing the installation again is not necessary.

3. AMPLISUITE

3.1. STARTING AMPLISUITE (STAND-ALONE MODULE)

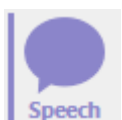


Open Amplisuite by double-clicking on the shortcut icon on the desktop. The Suite will start in the tone audiometry module.

In the case that several modules are available (audiometry and immittance module), the module can be switched by selecting the corresponding icon in the left-hand side of the screen.



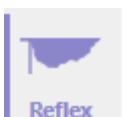
To access the tone audiometry module, select the **Tone** icon.



To access the speech audiometry module, select the **Speech** icon.



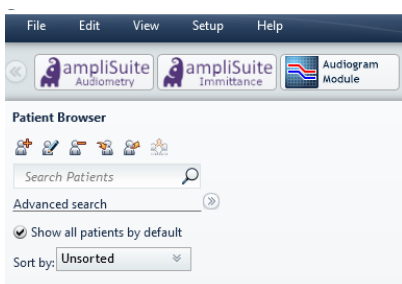
To access the immittance module, select the **Tymp** icon.



To access the reflex module, select the **Reflex** icon.

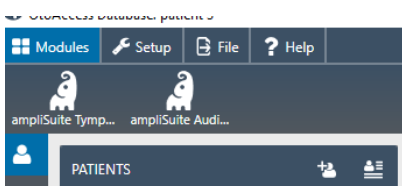
The selected module will be highlighted by colour and a line at the left of it.

3.2. STARTING AMPLISUITE (NOAH MODULE)



If you use Amplisuite with your Noah database, open the database first, select a patient and then open the desired module from the Noah toolbar.

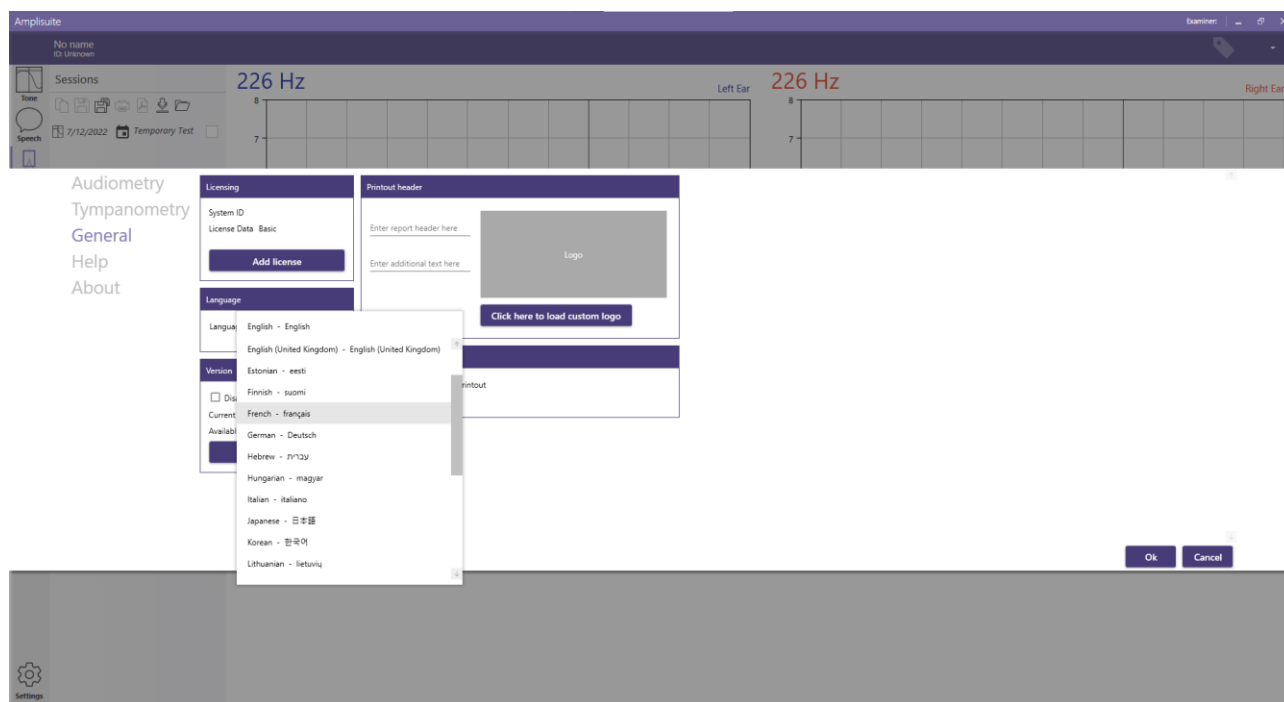
3.3. STARTING AMPLISUITE (OTOACCESS MODULE)



If you use Amplisuite with your Otoaccess database, open the Otoaccess database first, select a patient and then open the desired module from the OtoAccess toolbar.

3.4. CHANGING THE LANGUAGE

Select **SETTINGS** in the upper right corner of Amplisuite. A popup will open with all available Amplisuite settings. Select **GENERAL** to find the language settings on the left-hand side.

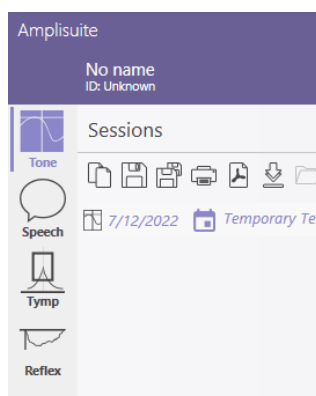


The following languages are available to use in the Amplisuite: Chinese (中文), English, Estonian (eesti), French (français), German (Deutsch), Hebrew (עברית), Hungarian (magyar), Italian (italiano), Japanese (日本語), Korean (한국어), Lithuanian(lietuvis), Polish (polski), Portugese (português), Russian (русский), Serbian (srpski), Spanish (español), Turkish (Türkçe), Thai(ภาษาไทย) or Vietnamese (Tiếng Việt).

Select the language you would like to use Amplisuite in and confirm the change by clicking **OK**. Amplisuite will require a restart for the changes to take place.

3.5. SWITCHING BETWEEN MODULES

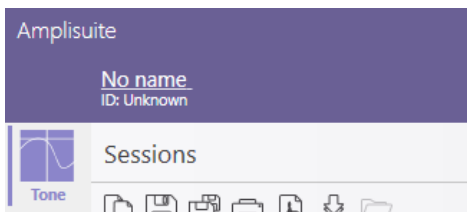
If you open Amplisuite without a database, the audiometry module will display as the home screen. You can switch between the audiometry and tympanometry modules, by clicking on the right icon, at left side toolbar. The currently selected module's icon will be highlighted by colour and a line at the left of it .



If you are using Amplisuite with a database, you select the desired module as is explained in sections 3.2 and 3.3.

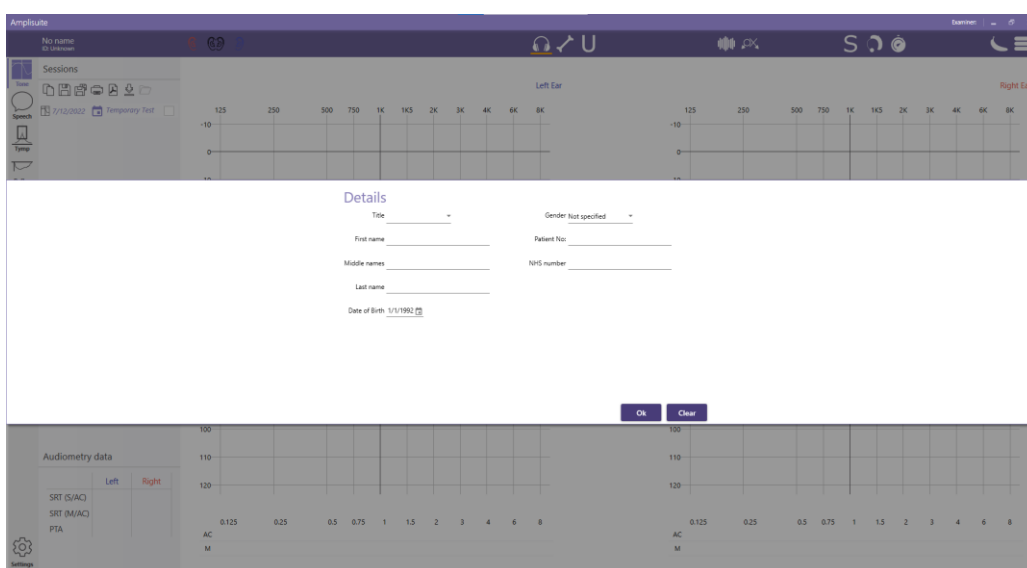
3.6. OVERALL FUNCTIONS

3.6.1. ADD PATIENT AND EXAMINER TEST DETAILS

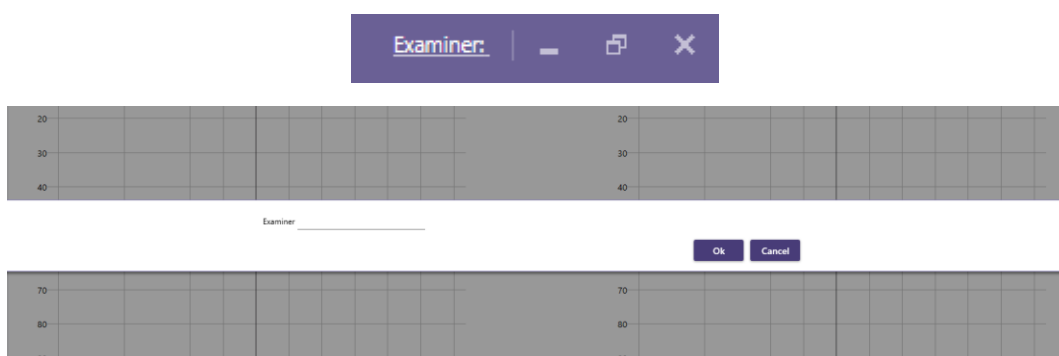


To enter basic patient information, click on the patient name on the top of left corner of the session bar. If no patient name has been assigned yet, the patient is called **No name**.

The patient details form will then be displayed. Enter the patient details and select **OK**.



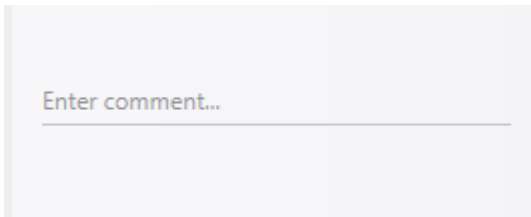
To add an examiner name, click on **Examiner** text, at the right top corner.



Added details will then be displayed on the main patients details screen and on the test printout (see 4.2.4).

If you are using Amplisuite with a database, both patient details and examiner name will be uploaded from the database automatically.

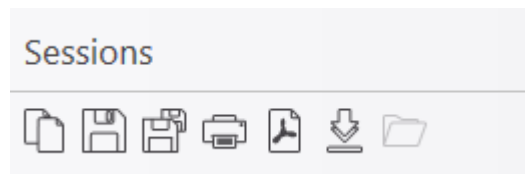
3.6.2. ADDING SESSION COMMENTS



At the bottom of the sidebar there is a comment section. Click the field to add a comment to the currently selected session.

Added comments will also be displayed on the printout(see 6.1.3).

3.6.3. SAVING A TEST



To save a test, please use one of the following saving options described below.



Please note that when using stand-alone module all results are removed after closing Amplisuite.



Save – saves the current session



Save All- saves all open and unsaved sessions to the database

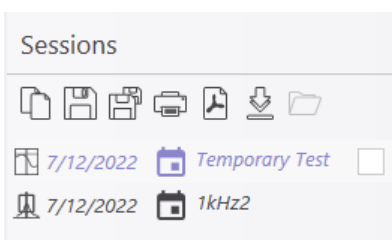


Copy – Copy the current session to temporary test (function accessible only in audiometry module)



Please note: As soon as you save a test it can no longer be edited.

3.6.4. CHANGING SESSION DATE



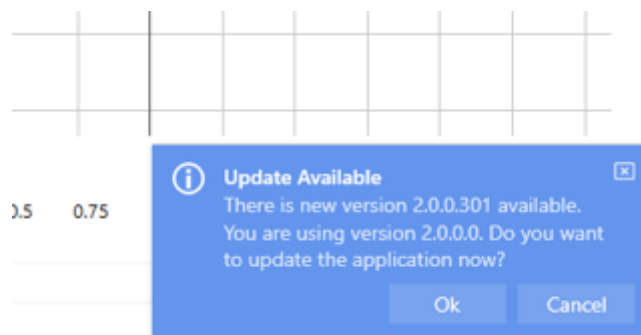
You can change the session date manually by pressing date in the session list, or you can select date by pressing the calendar icon.



Please note: You can't change a saved session date.

3.6.5. UPDATING AMPLISUITE

If there is new Amplisuite version available information will be displayed in bottom right corner. Select **Ok** to proceed with Amplisuite update, or select **Cancel** to keep using current version. You can disable update notification in **General Settings**(see 6.1.3).



Please note: Amplisuite will be restarted during version update. Please save or print all you data before you start it.

4. AUDIOMETRY MODULE

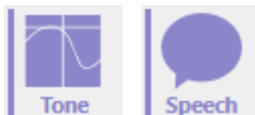
4.1. GENERAL

The audiometry module allows you to review audiometric test results (**Tone** and **Speech**).



Video available on how to use the audiometry module.

The audiometry module can be used with the following Amplivox Audiometers: 116, 170, PC850, 240, 260, 270 and 270+.



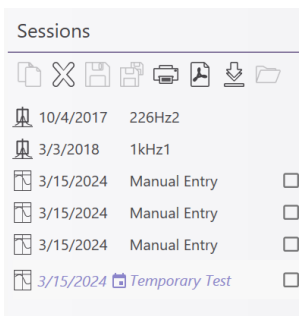
To access the module, select the tone or speech audiometry icon.

4.2. OVERALL FUNCTIONS

4.2.1. DOWNLOAD RESULTS FROM DEVICE



Download the current record displayed on the device to the PC (AC, BC and if available speech SRT).



As soon as a test is downloaded and selected, the result will be shown, and further details can be found in the session panel. Several sessions can be uploaded into Amplisuite and be opened through the session panel.

4.2.2. START AUTO TEST WITH OTOSURE OR PC850



If you own an Otosure or PC850 audiometer, you can start the auto test software from Amplisuite.

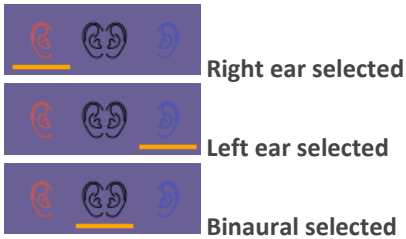
For more information about the how to conduct a test with the Otosure or PC850 audiometer please refer to your instrument manual.

4.2.3. EAR SIDE SELECTION

The ear to be displayed can be selected in 3 different ways:

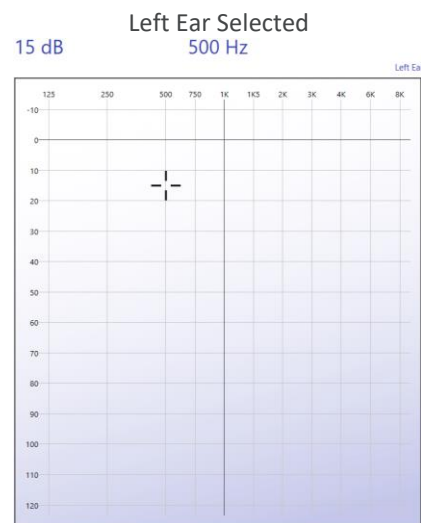
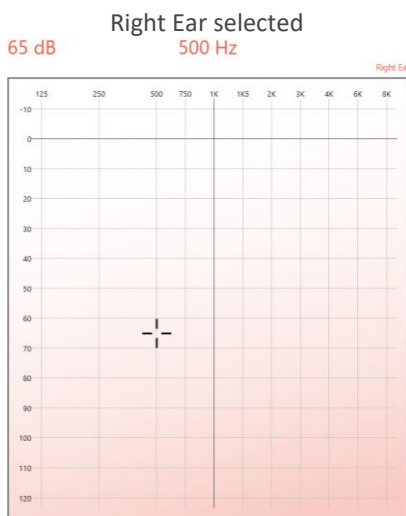
- **Mouse:** Double-click on the audiogram of the ear side to be tested (only possible when an audiogram for each ear is shown)
- **Keyboard:** Select **R** for right ear, **L** for left ear and **B** for binaural

• **Icons in Toolbar:**



One ear will be shown at a time and can be changed using the left, right or binaural ear icons in the control panel. The current selected ear will be highlighted with an orange line below.

The selected ear will be highlighted in red (right ear) or blue (left ear) or and the cursor will show in the graph area.



4.2.4. PRINTING AND PDF STORAGE



Print Results

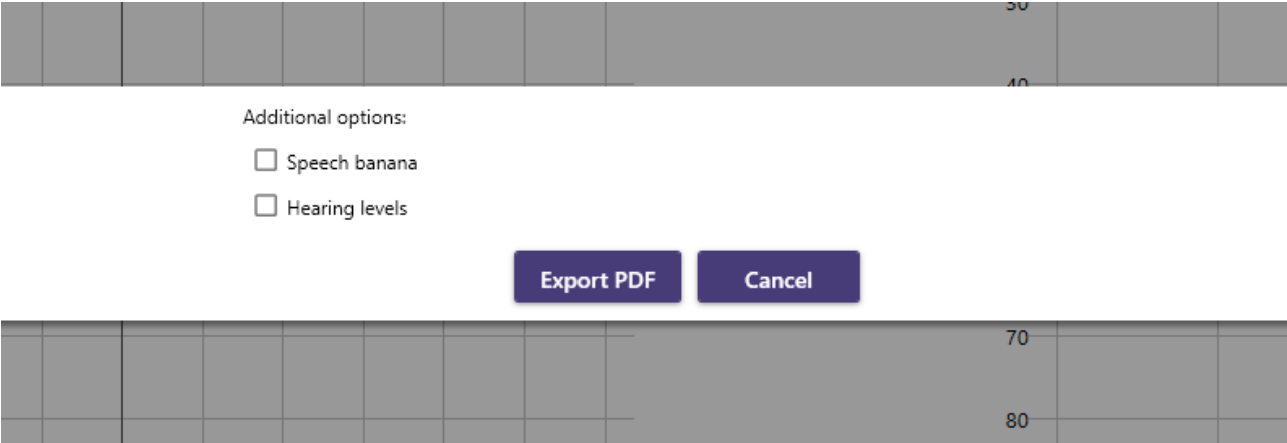
Selecting the print icon in the control panel will print the currently displayed test.



Store Result as PDF

Selecting the PDF icon in the control panel will store the current displayed test as a PDF.

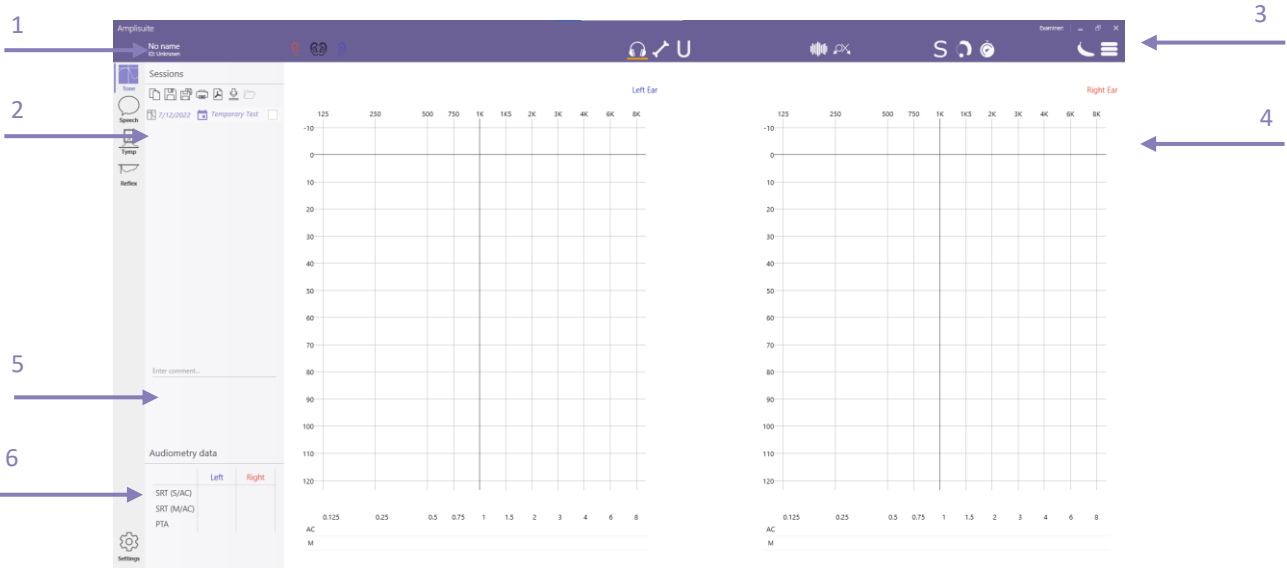
When printing or creating test PDFs you can add WHO hearing levels or speech banana to the audiograms (see 4.3.3).



4.3. TONE AUDIOMETRY MODULE

4.3.1. GENERAL

The audiometry module consists of patient and examiner information (1), the currently uploaded session details (2), the control bar (3), audiograms for the left and right ear in table (4), comment section(5) and diagram format and the PTA/PHL calculation (6),.



4.3.2. SELECTION OF AC, BC, FF AND UCL

In the toolbar, select the corresponding icon of the graph that shall be plotted. The following selection is possible:



Air Conduction (AC): Select this icon to plot the air conduction.



Bone Conduction (BC): Select this icon to plot the bone conduction.



U-Threshold (UCL/ULL): Select this icon to plot the uncomfortable loudness threshold.



Sound field (FF): Select this icon to plot the sound(free) field threshold.

In addition to the selection of AC, BC and UCL, masking can be activated. It is also possible to mark no response and aided.



Masking: Select this icon in addition to AC or BC to mark a masked threshold.



Not heard/no response (NR): Select this icon in addition to AC or BC to mark a no response frequency.



Aided: Select this icon in addition to AC, FF or UCL to mark a aided threshold.



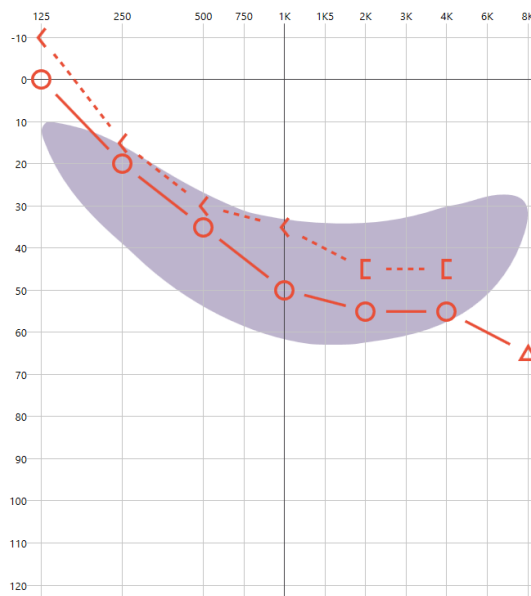
Please note: The data shown in the table below the graph, plotted or deleted is always equivalent to the selection (AC, BC, UCL, FF) made in the toolbar. If air conduction is selected, no bone data can be deleted and vice versa.

4.3.3. COUNSELING OVERLAYS

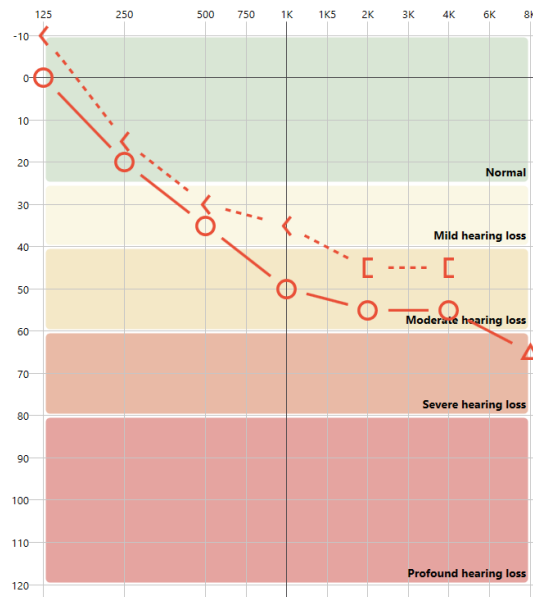
It might be desired to use additional explanation tools to help the patient better understand his or her hearing threshold.



Speech Banana: Will show the speech area as it is selected in the settings.



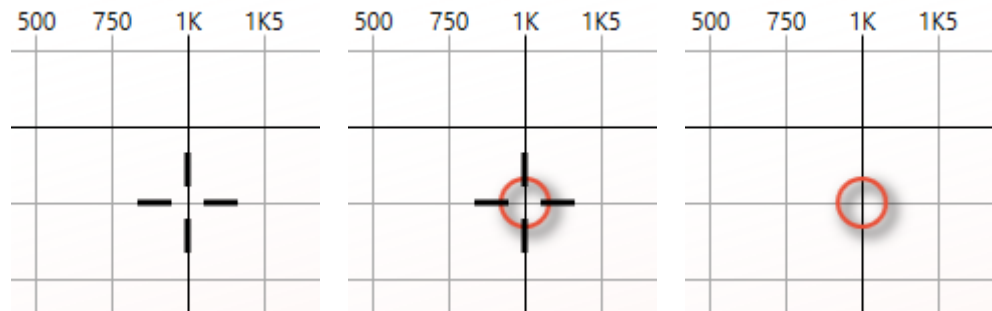
Hearing Levels: Will show the degrees of hearing loss based on the World Health Organization’s (WHO) recommendation.



4.3.4. ENTRY OF DATA

There are different options to enter test data. Data can be plotted directly into the graph using the mouse or the keyboard, or the **Manual Entry Table** below the audiogram.

Select the desired ear and test method (AC, BC, UCL, FF, (un)masked, NR and Aided) to start plotting data.



Mouse: Use the mouse to move the cursor to the desired frequency and level.

Double-click left and store the test point.

Right-click at any level of the frequency to delete the test point again.

Keyboard: Use the arrow keys to move the cursor to the desired frequency and level.

Hit the Enter-key or S-key on the keyboard to store the test point.

Hit the Delete key on the keyboard at any level of the frequency to delete the test point again.




As soon as the point has been entered, the table below the graph will show the equivalent value.

Manual Entry Table: Click in the table below the graph to enter the corresponding level of the selected frequency. The top row represents the Air or Bone conduction values, whereas the second row represents the masking values, if any exist.

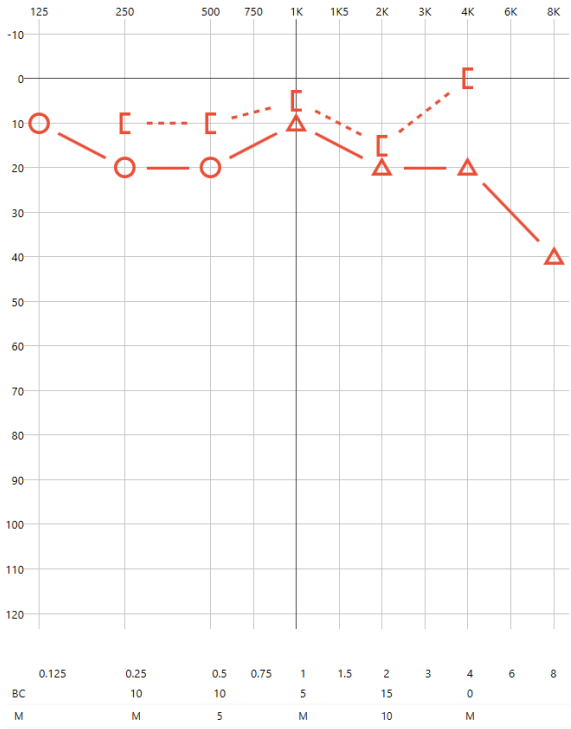
	0.125	0.25	0.5	0.75	1	1.5	2	3	4	6	8
AC	0	20	35		50		55		55		65
M											M

4.3.5. MASKING

Masking values can be added in two different ways.




Either, the masking button  in the toolbar is selected together with the AC  or BC  function, or the **Manual Entry** table is used to manually add the masking values.

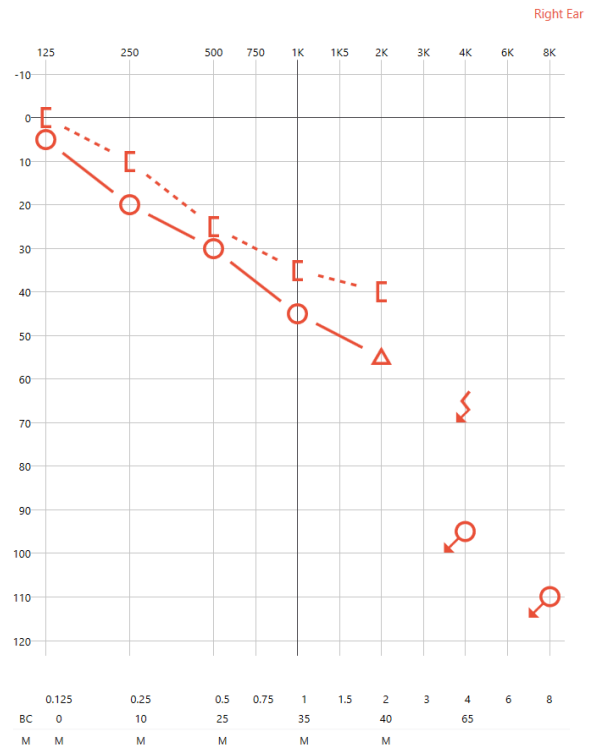
When masking is used, but the actual masking value is unknown, the table will show an **M** to indicate masking was active. If the masking value is known, a number will show in the second row of the table.



4.3.6. NO RESPONSE

In the case where the patient did not respond to the test signal, the symbol of **no response** (NR) can be added to the audiogram.

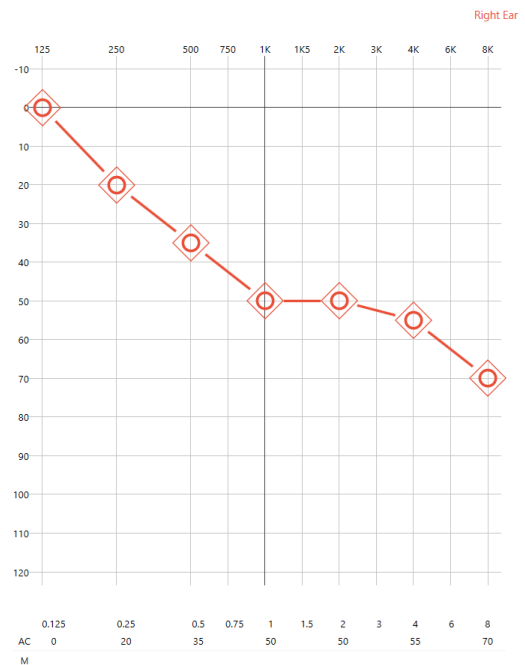
Select the NR button  in the toolbar together with the AC  or BC  function to mark the level as not heard.



4.3.7. AIDED

In the case where the patient was tested with his hearing instrument on, the symbol of **Aided** can be added to the audiogram.

Select the aided button  in the toolbar together with the AC , UCL  or FF  function to mark the level as aided.



4.3.8. DELETE A TEST POINT

In case a test point was placed incorrectly and should be removed, it is possible to delete a test point. Select the threshold that should be removed (air or bone) and move the mouse over the corresponding level, ideally the test point, to be deleted.

To delete the point, select the **delete** button on the **keyboard** or click the right button on the **mouse**.

4.3.9. AUDIOMETRY DATA CALCULATION

Audiometry data		
	Right	Left
SRT (S/AC)	52	32
SRT (M/AC)	28	33
PTA	41.3	51.3
NIHL	46.7	53.3
PHL	37.7%	

An automatic audiometry calculation takes place when adding air conduction values and will be visible for each ear in the **Audiometry Data** table, shown below the audiograms.

The PTA is calculated out of the average of the hearing threshold for specific test frequencies. These specific frequencies can be customized in the audiometry settings.

The SRT is the lowest level where a 50 % recognition was found. It is calculated separately for single syllabic and multi syllabic thresholds.

The PHL is calculated based on Republic of South Africa Government Gazette No. 422 instruction.

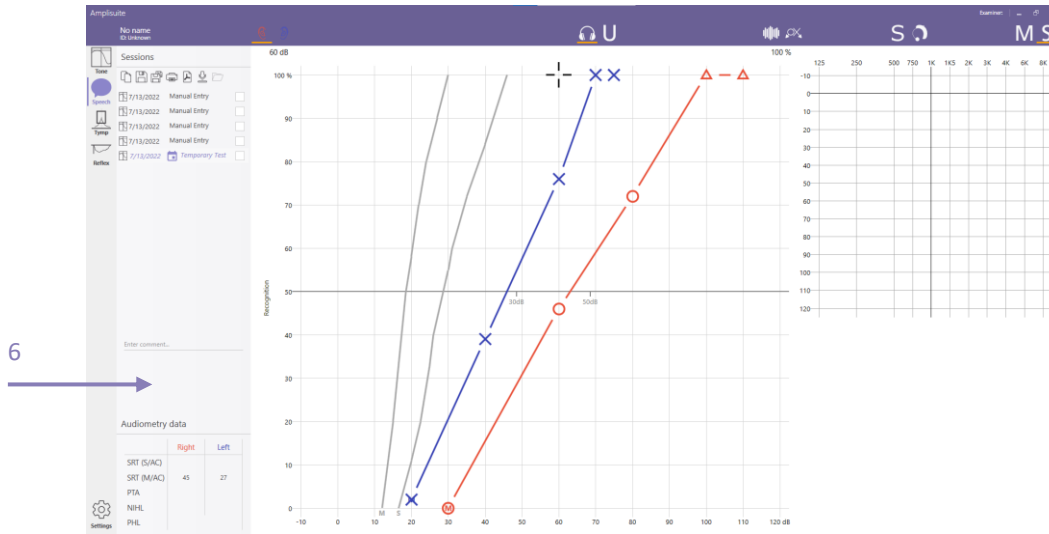
The NIHL is calculated out of the average of the hearing threshold for 2kHz, 3kHz and 4kHz frequencies. Value will be marked equal or higher then 25dB.

4.4. SPEECH AUDIOMETRY MODULE

4.4.1. GENERAL

The speech audiometry module consists of patient and examiner information **(1)**, the current uploaded session details **(2)**, the control bar **(3)**, audiograms for the left and right ear in the table **(4)** and diagram format **(5)**, comment section**(6)**.





4.4.2. SELECTION OF AC, BC AND UCL

In the toolbar, select the corresponding icon of the graph to be plotted. The following selection is possible:



Air Conduction (AC): Select this icon to plot the air conduction.



U-Threshold (UCL/ULL): Select this icon to plot the uncomfortable loudness threshold.



Sound field (FF): Select this icon to plot the binaural sound (free) field threshold.

In addition to the selection of AC, BC and UCL, masking can be activated. It is also possible to mark no response and aided.



Masking: Select this icon in addition to AC or BC to mark a masked threshold.



Not heard/no response (NR): Select this icon in addition to AC or BC to mark a no response frequency.



Aided: Select this icon in addition to AC, FF or UCL to mark an aided threshold.



Please note: The data shown in the table below the graph, plotted or deleted is always equivalent to the selection (AC, FF, UCL) made in the toolbar. If the air conduction is selected, no sound field data can be deleted and vice versa.

4.4.3. SINGLE SYLLABIC AND MULTI SYLLABIC THRESHOLDS

All options listed in 4.4.2 can be set for single syllabic and multisyllabic threshold.



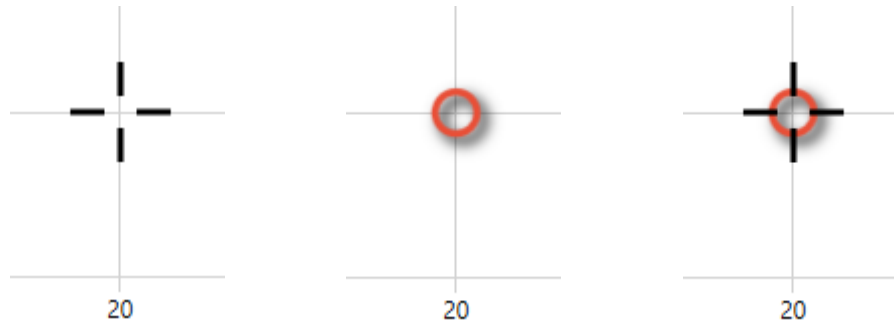
Single Syllabic: Select this icon to plot the single syllabic threshold.



Multi Syllabic: Select this icon to plot the multi syllabic threshold

4.4.4. ENTRY OF DATA


Data can be plotted directly into the graph using the mouse or the keyboard. Select the desired ear and test method (AC, BC, UCL, (un)masked and NR) to start plotting data.



Mouse:	Use the mouse to move the cursor to the desired frequency and level.	Double-click left and store the test point.	Right-click at any level of the frequency to delete the test point again.
Keyboard:	Use the arrow keys to move the cursor to the desired frequency and level.	Hit the Enter-key or S-key on the keyboard to store the test point.	Hit the Del-key on the keyboard at any level of the frequency to delete the test point again.



As soon as the point has been entered, the table below the graph will show the equivalent value.

4.4.5. MASKING

Select the masking button  in the toolbar is selected together with the AC  function to add a masked threshold.

4.4.6. NO RESPONSE

In the case where the patient did not respond to the test signal, the symbol of **no response** (NR) can be added to the audiogram.

Select the NR button  in the toolbar together with the AC  function to mark the level as not heard.

4.4.7. DELETE A TEST POINT

In case a test point was placed incorrectly and should be removed, it is possible to delete a test point. Select the threshold that should be removed (air or bone) and move the mouse over the corresponding level, ideally the test point to be deleted.

To delete the point, select the **delete** button on the **keyboard** or click the **right button on the mouse**.

4.4.8. SRT CALCULATION

Audiometry data		
	Right	Left
SRT (S/AC)	52	32
SRT (M/AC)	28	33
PTA	41.3	51.3
NIHL	46.7	53.3
PHL	37.7%	

An automatic audiometry calculation including SRT values, takes place when adding both single and multi syllabic thresholds values and will be visible for each ear in the **Audiometry Data** table, shown below the audiograms.

The SRT is the lowest level where a 50 % recognition was found. It is calculated separately for single syllabic and multi syllabic thresholds.

For more information see 4.3.9.



Please note: SRT is calculated change when normative curves are enabled. In this case the value is an expression of how much you need to turn up the level compared to normative data in order for the patient to be able to repeat 50%. See 4.6.6.

4.5. BASELINE COMPARISON

Sessions

7/13/2022 Manual Entry

7/13/2022 Manual Entry

7/13/2022 Manual Entry

7/13/2022 Temporary Test

Measurements obtained for the same patients can be overlapped and displayed at the same time for review purposes.

To show several curves at once, select the check box next of the test you want to display. The selected thresholds will be shown in a different color to allow a differentiation of the different measurements. The color will be displayed next to the selected test.

Please note: You can show up to 10 tests at once. If you select more than 10, the first selected test will be deselected.

Sessions

7/13/2022 Manual Entry

7/13/2022 Manual Entry

7/13/2022 Manual Entry

7/13/2022 Temporary Test

Enter comment...


Audiometry data

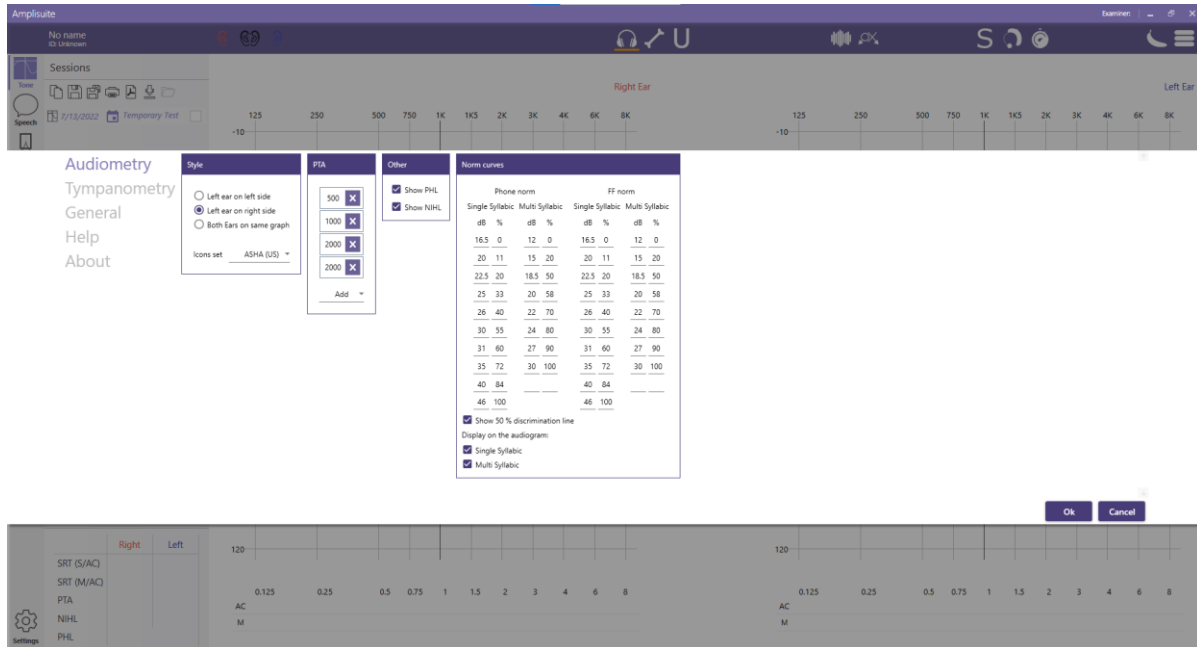
	Right	Left
SRT (S/AC)		
SRT (M/AC)		
PTA	96.3	
NIHL	115	
PHL		



4.6. AUDIOMETRY SETTINGS

4.6.1. GENERAL

Selecting the settings icon  at the bottom of Amplisuite left sidebar will open a pop-up with all available settings for the audiometry modules.



4.6.2. POSITION OF EAR SIDE SPECIFIC AUDIOGRAM

Depending on your preferences, you might like to have the audiogram of the right ear displayed on your right hand side and the one of the left ear on your left hand side. In this case, select **Left ear on left side**.

Others prefer to see the audiogram arrangement according to the patients view. In this case, select **Left ear on right side**.

If you want to see the thresholds for both ears on one audiogram, please select **Both ears on the same graph**.

4.6.3. AUDIOGRAM ICON SET

The audiogram icons used in the audiometry module might be dependent on your location. The Amplisuite audiometry module offers you 5 different icon sets, based on your location: ASHA (US), Australia, BSA (UK) or Hong Kong.

4.6.4. PTA CALCULATION



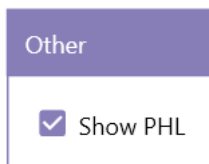
Amplisuite offers to calculate the PTA (Pure Tone Average) which is shown in both the Tone and Speech Audiometry Module.

The frequencies used for the PTA calculation can be customized. In the dropdown menu, select all frequencies that should be part of the PTA calculation. To add a frequency select the **Add** button, then select the frequency. To delete a frequency from the calculation, click on the cross next to it.

It is possible to have the same frequency selected several times for the PTA calculation (e.g. 500, 1000, 1000 and 2000 Hz).

By default, the 500, 1000, 2000 Hz are selected for the PTA calculation.

4.6.5. SHOW PHL AND NIHL



To see PHL or NIHL calculation on the test screen select **Show PHL** or **Show NIHL** box.

4.6.6. SPEECH NORMATIVE CURVES

Norm curves					
Phone norm			FF norm		
Single Syllabic	Multi Syllabic		Single Syllabic	Multi Syllabic	
dB	%	dB	%	dB	%
16.5	0	12	0	16.5	0
20	11	15	20	20	11
22.5	20	18.5	50	22.5	20
25	33	20	58	25	33
26	40	22	70	26	40
30	55	24	80	30	55
31	60	27	90	31	60
35	72	30	100	35	72
40	84			40	84
46	100			46	100

Show 50 % discrimination line

Display on the audiogram:

Single Syllabic

Multi Syllabic

Amplisuite offers option to set speech normative curves for both single and multi syllabic thresholds.

Both multi and single syllabic as well as Phone(air) and Sound Field(FF) threshold can have separate normative data.

To show Single Syllabic and Multi Syllabic threshold on speech audiogram select **Single Syllabic** and **Multi Syllabic** box.

To show discrimination line on speech audiogram select **Show 50% discrimination line**.

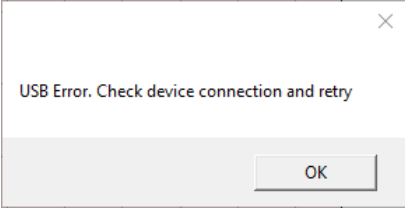


Please note: SRT is calculated change when normative curves are enabled. In this case the value is an expression of how much you need to turn up the level compared to normative data in order for the patient to be able to repeat 50%. See 4.4.8 .

4.7. TROUBLESHOOTING AUDIOMETRY



Please note: Refer to the installation & operating instructions provided with your instrument(s) for details of the data transfer operation and errors that could possibly occur. If a fault cannot be fixed, the operator is cautioned against repeatedly restarting the instrument.

PROBLEM	CAUSE	SOLUTION(S)
Instrument doesn't connect. 	<ul style="list-style-type: none"> • Device is not switched on • USB connection unstable 	<ul style="list-style-type: none"> • Switch on /Restart device • Check USB connection in both instrument and PC • Ensure cable is in good working order
No data is transferred to PC.	<ul style="list-style-type: none"> • Specified location to store data is different than expected • Specified location to store data does not exist • LoadIt.exe is stored in a different location 	<ul style="list-style-type: none"> • Review the store location in settings • Store LoadIt.exe in same folder as Amplisuite.exe
Text is outside the boxes on created PDF.	<ul style="list-style-type: none"> • Windows default PDF creator is uninstalled 	<ul style="list-style-type: none"> • Install Microsoft Print to PDF, you can find on Microsoft website.

5. ADMITTANCE MODULE

5.1. GENERAL

The admittance module allows you to review tympanometric (**Tymp**) and acoustic reflex test (**ART**) results. The admittance module can be used with all Otowaves 102,102-C, 202, 303 and 302+.




Video available on how to use the admittance module.

5.2. OVERALL FUNCTIONS

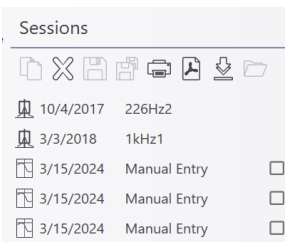
5.2.1. OPEN TEST RESULT(S) FROM PC



Open from file

To review any test results which have been **DOWNLOADED**  from an Otowave, select the **OPEN** icon in the control bar of Amplisuite.


Only one test at a time can be opened and imported into Amplisuite.



As soon as a test is selected, the result will be shown and further details can be found in the session panel.

Several sessions can be uploaded into Amplisuite and opened through the session panel.

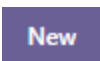
5.2.2. DOWNLOAD RESULTS FROM DEVICE

After pressing **download**  button two options will be displayed to select.



Download all

All records stored on the device are transferred to the PC.



Download new

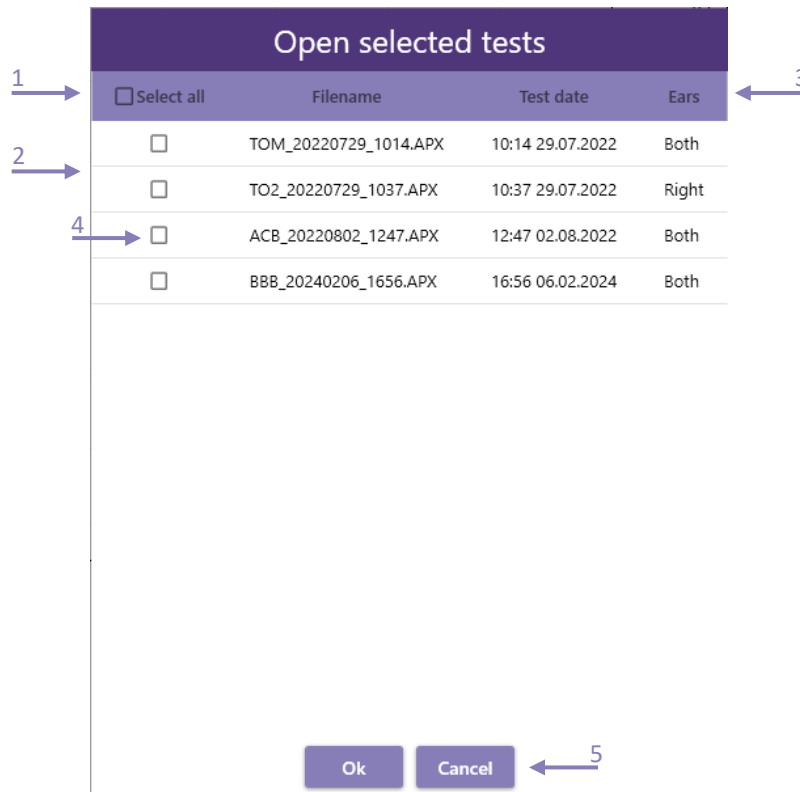
Records stored on the device, which have not been sent yet, are transferred to the PC.



Please note: The option 'Download un-sent records from Tympanometer' is not supported on the Otowave 202 running firmware version prior to 1.0.0.043200.

After selecting one of the options new window will be displayed. It allows to add selected test to patient session.

Select all tests(1), list of downloaded tests(2), select column to sort(3), press checkbox to select test(4), press **Ok** to add all selected tests to the session, **Cancel** to close the window without any test added(5).



There are some slight differences in the download function using the Otowave 102 than either the Otowave 202 or 302.

102		102-C, 202, 302 and 302+
Transferal	Infrared	USB
Special attention	If you can't find the Otowave 102 results after you've transferred them, look in Control Panel > Infrared for the location that files will be transferred to (under Save received files here). Note that this location will be retained until changed.	Before attempting to download test results, ensure that the Amplisuite & USB Device Drivers have been correctly installed.



Please note: Refer to the operating manual of your Otowave for further guidance and troubleshooting advice regarding the connections.

When downloading files from the 102-C, 202 or 302 unit, these files are automatically placed in the location specified in Amplisuite. The default location is the 'User Profile' within Windows. Typically, this will be **C:\Users\,**

where <user name> is the name of the user account currently logged into Windows. This can be changed to any location you wish by setting the radio button to 'Specify Location', specifying a location of your choice and pressing 'OK'.



Please note: If the specified folder does not exist, the transfer will not take place, though the transfer screen will appear to be normal. Ensure the specified location exists.

When downloading results from the 102 unit, a new folder containing the files will be created on the Desktop. Each patient test is stored on the PC as a separate file within the **Amplivox** folder. If the Amplivox folder already exists on the PC, subsequent transfer sessions automatically create new folders called **Copy 1 of Amplivox**, **Copy 2 of Amplivox** etc. To avoid excessive duplication of these folders, move the transferred files to a preferred location on the PC and then delete the **Amplivox** folder. Files have the extension **.APX** and they follow a specific naming convention:

- nnn_DDMMYYYY_HHMM.APX¹ (when the default date format is used on the Otowave 102)
- nnn_MMDDYYYY_HHMM.APX (if the date format was changed to **MM/DD/YY** on the Otowave 102 – see the product operating manual)



Please note: Sometimes it might be necessary to attempt to download the files a second or third time; this is due to limitations in the software supplied with Windows being unable to initiate communication properly with the Otowave 102.

5.2.3. PRINTING AND PDF STORAGE



Print Results

Selecting the print icon in the control panel will print the current previewed test.



Store Result as PDF

Selecting the PDF icon in the control panel will store the current previewed test as a PDF.

In both cases, when the print or the PDF button is pressed, a popup will show with print/PDF options. From here, you can select what baseline mode shall be shown on the printout.

¹ nnn is either the initials entered when the test was saved in the database on the Otowave 102, or 'xxx' (lower case) if none have been entered yet (e.g. if it is the **Last Test** – see the Otowave 102 operating manual). DDMMYYYY (or MMDDYYYY) is the date of the test. HHMM is the time of the test

Printer
OneNote for Windows 10

Page size
ISOA4

Margin
Small

Page orientation
Portrait

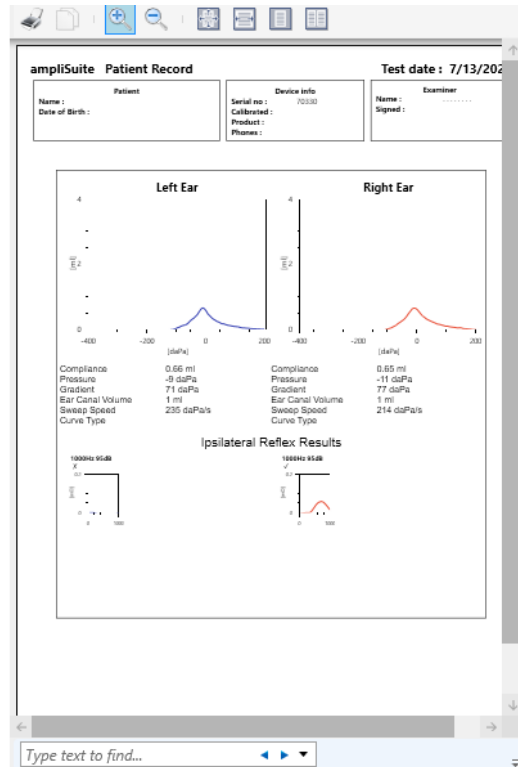
Output color
Color

Available baseline modes
Scalar200

Copies
1

Page count : 1

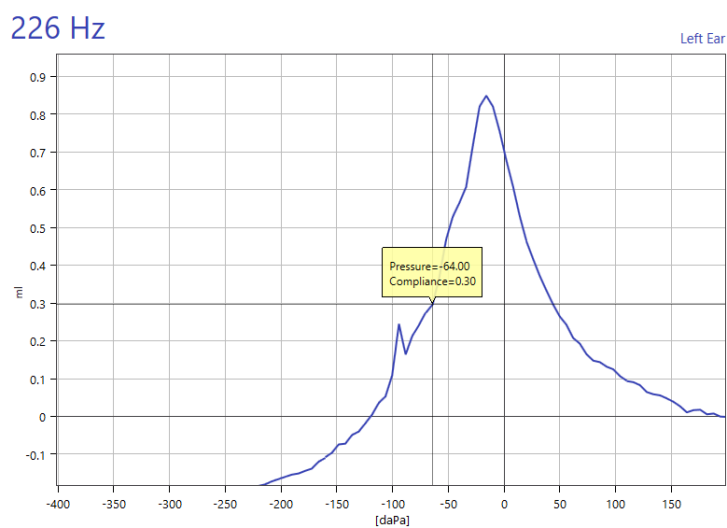
Print **Cancel**



5.2.4. ZOOM IN AND OUT

Any graph displayed in Immittance Module can be adjusted.

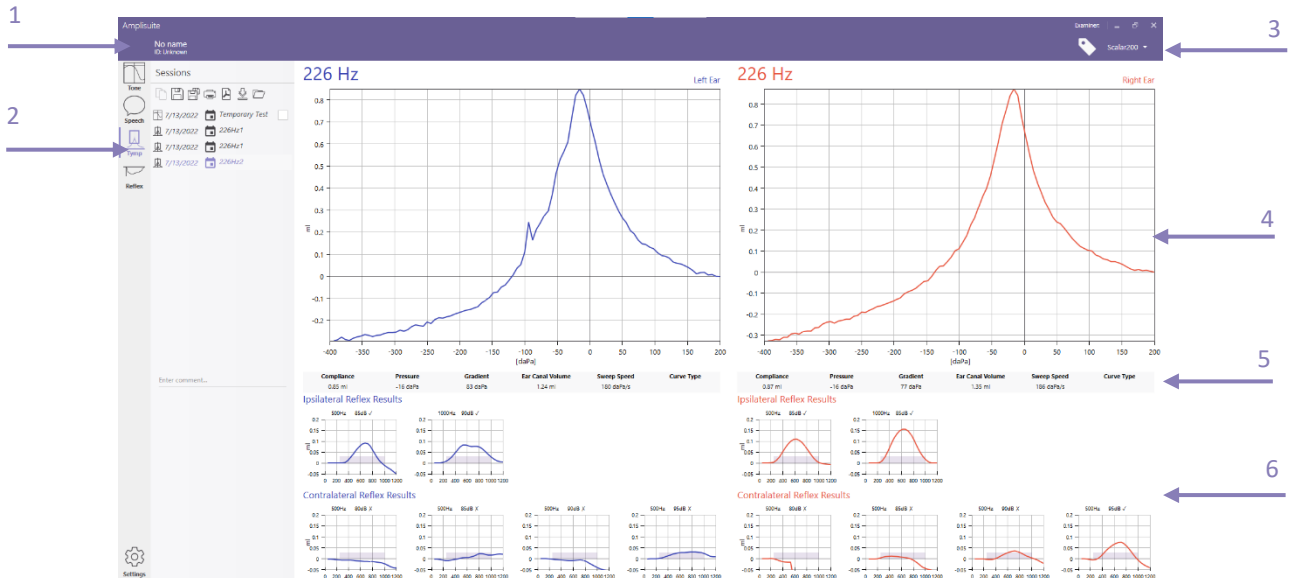
- Scroll in to zoom in
- Scroll out to zoom out
- Click mouse scroll wheel(mouse 3 button) to select and zoom
- Double click mouse scroll wheel(mouse 3 button) to change graphs back to default size
- Right click and hold to move graph
- Left click and hold to display specific point data



5.3. TYMPANOMETRY MODULE

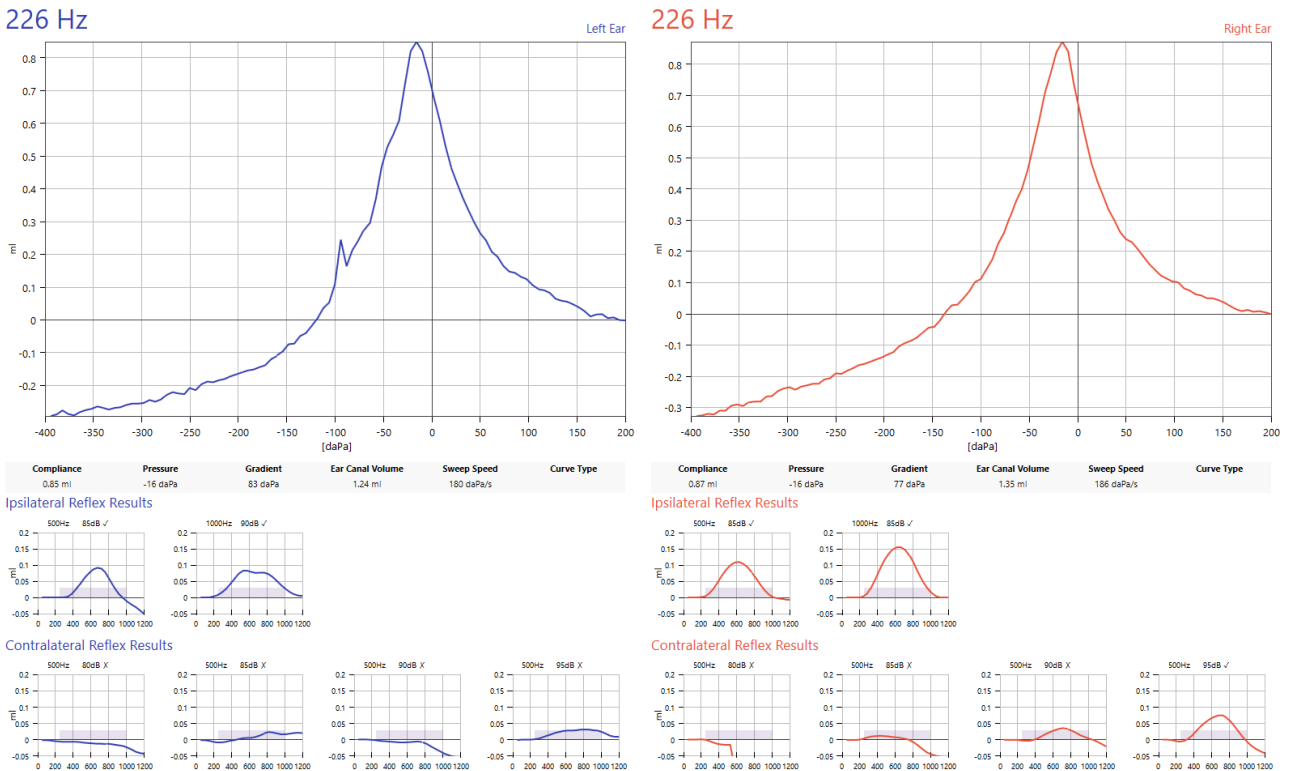
5.3.1. GENERAL

The tympanometry module consists of patient information (1), the current uploaded session details (2), the control bar (3), tympanograms for the left and right ear (4), test parameters for tympanometry (5) and the preview of ipsi and contralateral test results if available (6).



5.3.2. TYMPANOMETRIC TEST RESULTS

The graphs are similar to those shown on the Otowave.



On the tympanometry graphs, the option is given to show a normative box. This area is intended to help identify normal tymp curves, according to default or customised specifications. In the case that the peak of the curve falls into the normative area, the tymp is marked with a ✓ to identify a normal shaped curve.



Please note: Depending on the version of your Otowave, a normative box based on the BSA standards will be transferred with the test result to the PC. If you prefer to define your own normative boxes, please refer to chapter 5.5.

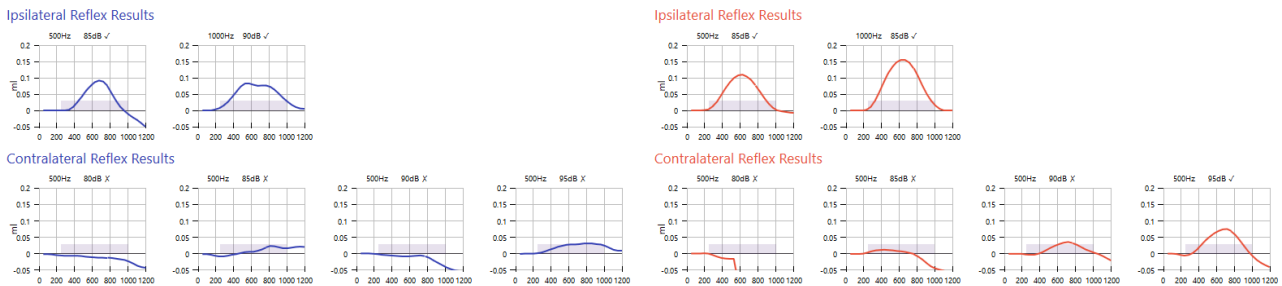
Below the tympanograms, the test parameter for the tymp curve shown are listed:

- **Compliance:** Peak of tympanogram in ml (226 Hz) or mŪ/mmho (1 kHz), representing the maximum compliance/admittance of the middle ear system²
- **Pressure:** Equivalent pressure point describing the compliance peak.
- **Gradient:** Width of tympanogram at 50% height
- **Ear Canal Volume:** Equivalent volume of the ear canal in ml
- **Sweep Speed:** Actual average sweep speed of the pump during the measurement
- **Curve Type:** Option to classify the tympanogram pattern based on the Jerger system (1970)³. Refer to chapter 5.3.3 for more detailed information on how to assign the classification.



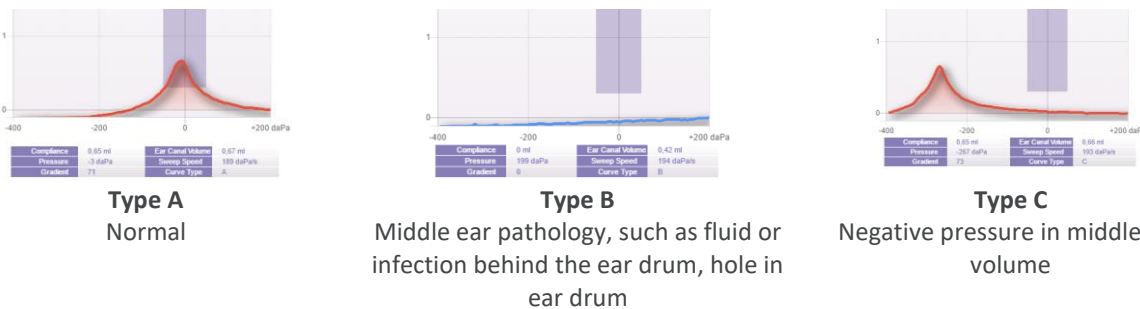
Please note: The compliance and pressure value as well as the gradient are dependent on the position of the cursor in the Otowave unit before data transfer. When using the cursor function in the Otowave, re-defining the peak value of the tymp curve, the value for compliance, pressure and gradient are adjusted accordingly.

A small preview of ipsi and contralateral reflexes are shown below the test parameter. A review in more detail can be found in the ART module (refer to chapter 5.4). The reflexes are shown for all frequencies tested. When marked with a ✓, a reflex trace was detected, which was regarded as a valid reflex response by the Otowave. When marked with a x, a reflex trace was detected, but this was not regarded as a valid reflex response by the Otowave.



5.3.3. ASSIGN CURVE TYPE (JERGER)

Amplisuite offers you the function to classify the tymp curves after the Jerger system. There are three main types of tympanograms according to Jerger, specified by the letters A, B, and C, as shown in the figure below.



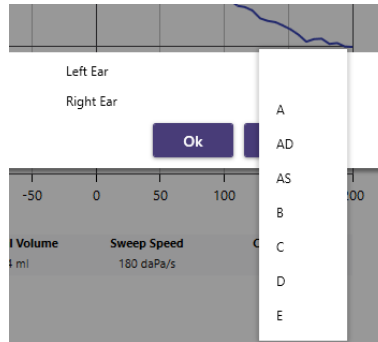
² The maximum compliance occurs when the pressure in the middle ear cavity is equal to the pressure in the external auditory canal.

³ J Jerger (1970). Clinical experience with impedance audiometry. Archives of Otolaryngology, 92 (4), 311-324.

Amplisuite will in addition allow you further classification such as AD and AS, as well as D and E.

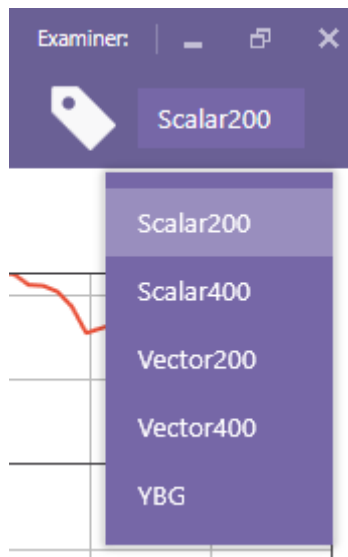


Selecting the tag icon in the control panel will open a pop-up. From here, the categorisation for each ear takes place. Select the drop down to choose between the different tympanometry types.



5.3.4. BASELINE MODE

Select Baseline button in right side of the control bar to select tympanometry graphs baseline.



Scalar and vector mode

Changing the baseline mode from 2 and 4 scalar (226 Hz and 1000 Hz) or 2 and 4 vector (only 1000 Hz).

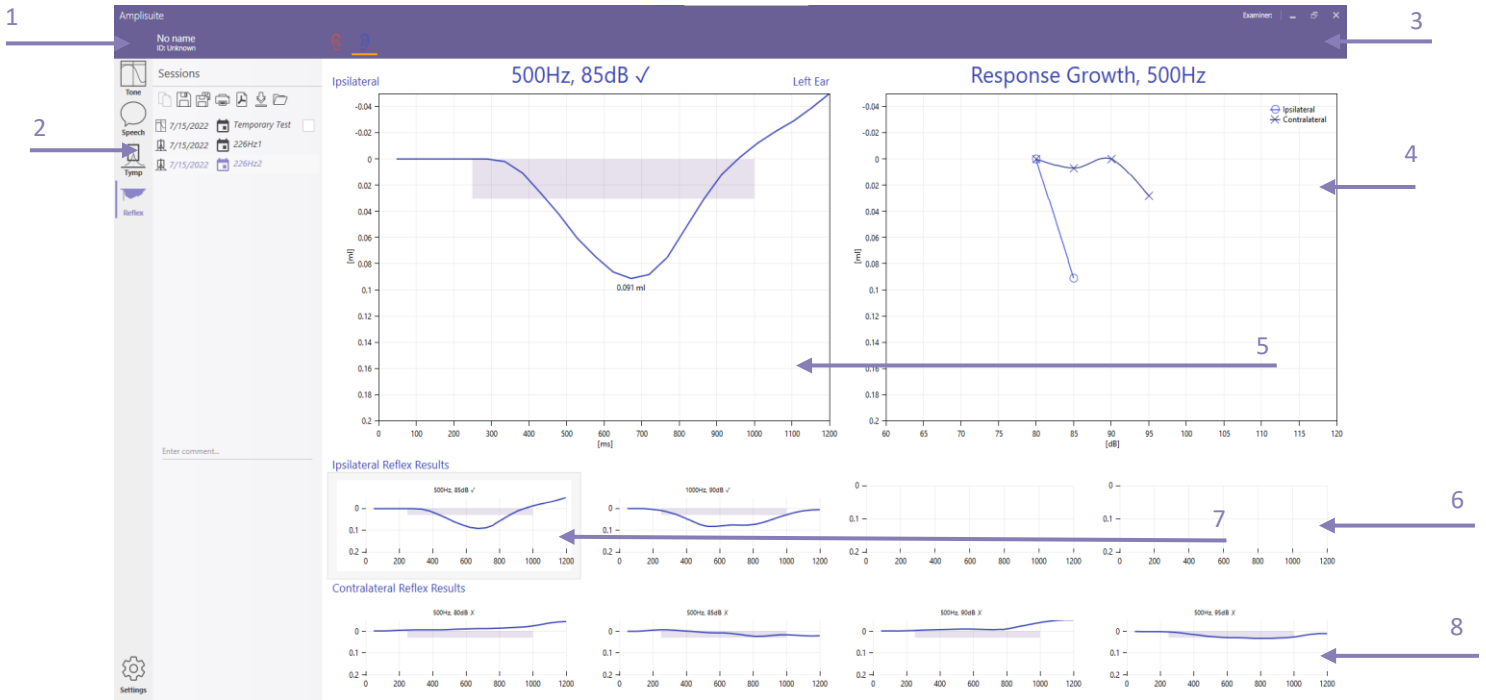
YBG curve

Show YBG graph (only available for 1000 Hz tests)

5.4. ACOUSTIC REFLEX MODULE (ART)

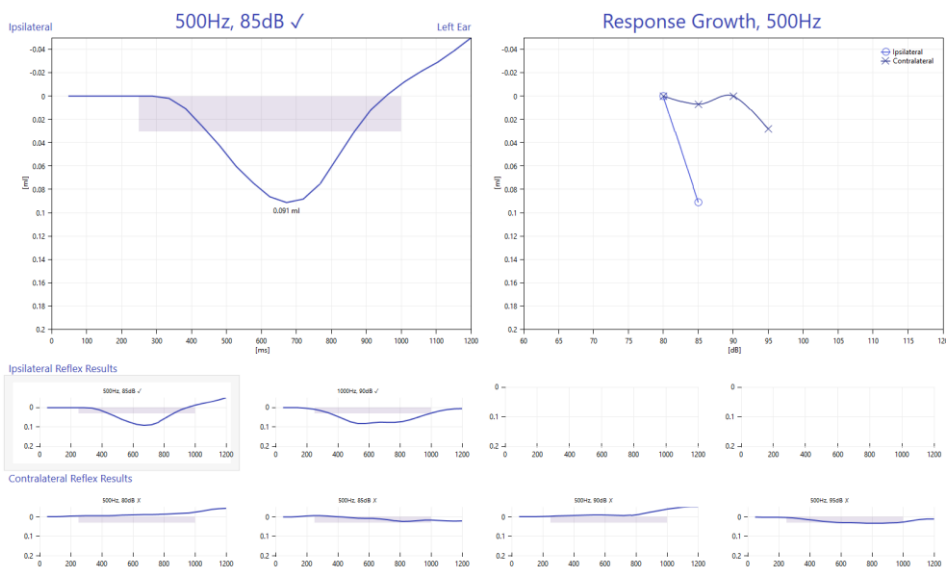
5.4.1. GENERAL

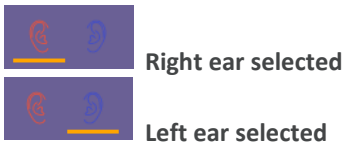
The acoustic reflex (ART) module consists of patient information **(1)**, the currently uploaded session details **(2)**, the control bar **(3)**, a reflex growth diagram for the current selected ear **(4)**, reflex diagram **(5)** based on the selected reflex graph **(7)** and all available ipsi and contralateral reflex results **(6 and 8)**.



5.4.2. ACOUSTIC REFLEX TEST RESULTS

The graphs are similar to those shown on the Otowave.

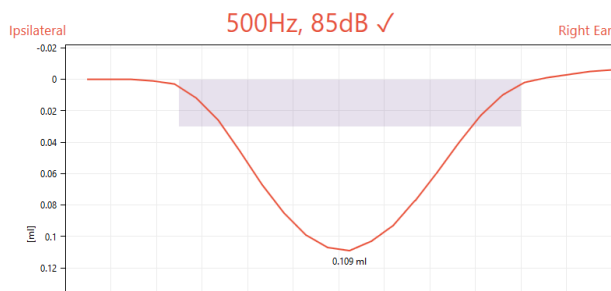




One ear will be shown at a time and can be changed using the selected ear icons in the control panel. The current selected ear will be highlighted with an orange line below.

To review a single graph in the detail view, select the specific reflex from the ipsilateral or contralateral results. The current selection will be highlighted with a purple frame.

When marked with a ✓, a reflex trace was detected, which is regarded as a valid reflex response by the Otowave. When marked with a x, a reflex trace is detected, but this was not regarded as a valid reflex response by the Otowave. The criteria to reach a pass can be shown visually in each of the graphs.



The criteria are shown in the form of a purple box in the reflex graph.

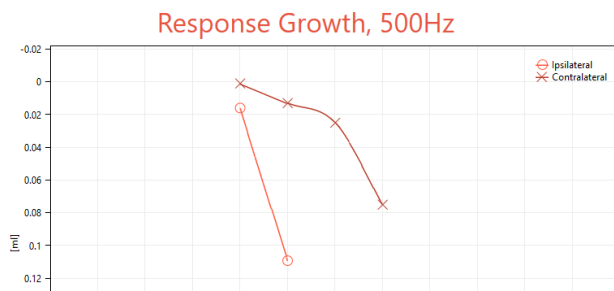
The height of the box is depending on the threshold criteria defined in your instrument. The length of the box is given by the time the test signal is presented.

If the amplitude of the reflex reaches the height of the box as well as the contraction time meets the presentation time of the test stimulus, among other criteria, the reflex is considered a pass.



Please note: The box shown is depending on the version of your Otowave.

The reflex growth diagram⁴ is shown for the current selected frequency. The ipsilateral plot is with an o for the right ear and an x for the left ear, whereas the contralateral side is marked with the opposite sign. The definition of contralateral is according to Katz, 2002⁵.



The acoustic reflex magnitude increases as the stimulus level increases. The peak magnitude of the reflex is plotted for each level tested, resulting in a reflex growth function.

The normal acoustic reflex growth function for pure tone stimuli shows that reflex magnitude increases linearly with the stimulus level⁵.


This graph helps you quickly identifying the amplitude growth for the selected frequency.

⁴ BH Sprague, TL Wiley, MG Black (1981). Dynamics of Acoustic Reflex Growth. *Audiology* 20: 15-40(1981)
 GB Michael, LW Terry (1979). Acoustic-Reflex Growth and Loudness. *JSLHR* June, 1979

⁵ J Katz. *Handbook of Clinical Audiology – Fifth Edition*. Lippincott Williams & Wilkins, 2002

5.5. ADMITTANCE SETTINGS

5.5.1. GENERAL

Selecting the settings icon  at the bottom of Amplisuite left sidebar will open a pop-up with all available settings for the tympanometry and acoustic reflex modules.

Audiometry

Tympanometry

General

Help

About

Location to transfer APX files

In User Profile

Specify location

Normative Boxes

226 Hz

Show Normative Boxes

Custom Range ▾

From to daPa

From to cc

1000 Hz

Show Normative Boxes

Reflexes

Show Sensitivity

Reverse Graph Polarity

5.5.2. STORAGE LOCATION

When tests are downloaded to the PC, they are automatically placed in the location specified in Amplisuite. The default location is the **User Profile** within Windows, which is `C:\Users\, where <user name> is the name of the user account currently logged into Windows.`

This can be changed to any location you wish by setting the radio button to **Specify Location**. It is then required that you specify a location of your choice.

5.5.3. NORMATIVE BOXES TYMPANOMETRY

If desired, normative boxes can be shown in the tympanograms. This function is enabled by selecting the checkbox. There are 2 default normative boxes for 226 Hz, based on the recommendation of the BSA⁶ (UK) or the ASHA⁷ (US).

	BSA (UK)	ASHA (US)
Volume	0.3 to 1.6 cc	0.3 to 1.4 cc
Pressure	-50 to + 50 daPa	-150 to 50 daPa

⁶ British Society of Audiology. Recommended Procedure Tympanometry. 2013

⁷ ASHA, Committee on Audiometric Evaluation. Guidelines for Audiometry Symbols. 1990

If it is preferred to use user-specific normative areas, the **CUSTOM RANGE** option can be selected to define your own customised box.

5.5.4. ACOUSTIC REFLEXES


When **Show Sensitivity** is selected, the threshold line defined in the settings of your admittance meter (between 0.01ml and 0.5ml) will be shown in the reflex graph.

When **Reverse Graph Polarity** is selected, the reflex graphs are plotted downwards.

5.6. TROUBLESHOOTING ADMITTANCE

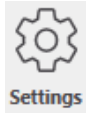


Please note: Refer to the installation & operating instructions provided with your instrument(s) for details of the data transfer operation and errors that may occur. If a fault condition cannot be cleared, the operator is cautioned against repeatedly starting the instrument.

PROBLEM	CAUSE	SOLUTION(S)
Instrument doesn't connect. 	<ul style="list-style-type: none"> • Device is not switched on • USB connection unstable 	<ul style="list-style-type: none"> • Switch on /Restart device • Check USB connection in both instrument and PC • Ensure cable is in good working order
No data is transferred to PC.	<ul style="list-style-type: none"> • Specified location to store data is different than expected • Specified location to store data does not exist • LoadIt.exe is stored in a different location 	<ul style="list-style-type: none"> • Review the storing location in the settings • Store LoadIt.exe in same folder as Amplisuite.exe
Text is outside the boxes on created PDF.	<ul style="list-style-type: none"> • Windows default PDF creator is uninstalled 	<ul style="list-style-type: none"> • Install Microsoft Print to PDF, you can find on Microsoft website.

6. SETTINGS

6.1.1. GENERAL



There are a number of configuration settings available in Amplisuite. To access these, Selecting the settings icon at the bottom of Amplisuite left sidebar. A popup will appear to allow you to change different settings.

6.1.2. ABOUT

Audiometry

Tympanometry

General

Help

About



Address: Amplivox Ltd.
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Birmingham Business Park,
Birmingham, West Midlands, B37 7YG

E-mail: hello@amplivox.com

Website: www.amplivox.com

Tel: +44 1865 880 846

In the **About** section you can find useful information about Amplivox. You can contact us directly via email or access our website.

6.1.3. GENERAL

Under **General**, you can find information about the System ID, the license data and the version of Amplisuite.

Furthermore, the printout settings are located here. From here, you can add and edit the printout header, upload a custom logo, and some additional information you would like to show on the printout.

- Audiometry
- Tympanometry
- General**
- Help
- About

Licensing

System ID

License Data Basic

Add license

Language

Language English - English

Version

Disable update notifications

Current Version 2.0.0.0

Available Version 2.0.0

Check for update

Printout header

Enter report header here

Enter additional text here

Logo

Click here to load custom logo

Printout settings

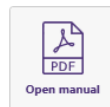
Show comments on printout

Hide calibration date

6.1.4. HELP

Under **Help**, the Amplisuite manual is stored. The manual can also be opened from every screen, by pressing F1 key.

Audiometry
Tympanometry
General
Help
About





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