Cochlear®
Hear now. And always

Custom Sound® Pro
software

Custom Sound®
Version 7.0
User Guide

Product information

Product name: Custom Sound®
Version: 7.0

This guide refers to the product by its trade name, Custom Sound Pro.

Symbols used in this guide

Note

Important information or advice

Tip

Time saving hint

Contents

About Custom Sound® Pro software

Custom Sound® Pro software is intended to be used by cochlear implant and hearing care professionals to create and modify hearing profiles in order to provide comfortable and usable stimulation to cochlear implant patients. (The hearing profile refers to the recipient MAP as well as other device configuration completed in Custom Sound as described in this guide.)

- Login
- Patient List
- Dashboard
- Measure
- Adjust
- Finalise
- My clinic
- Reference topics

Intended purpose

The fitting software is used in combination with other devices as part of a hearing implant system. It is intended to create and modify hearing profiles, to monitor the performance of the system and to facilitate firmware updates of the system.

Indications

These sections contain the indication for use for the core Custom Sound Pro software and specific indication for features within the software.

Custom Sound Pro software

Custom Sound Pro software operates in conjunction with a compatible Cochlear™ sound processor. It is compatible with all Cochlear Nucleus® implants and auditory brainstem implants:

- CI600 Series Implants: CI612, CI622, CI624, CI632
- CI500 Series Implants: CI512, CI513, CI522, CI532, CI551, ABI541
- CI24RE Series Implants: CI422, CI24REH (Hybrid L24), CI24RE (CA), CI24RE (ST), CI24RE (CS), CI24RES, Hybrid S12, Hybrid S8
- CI24R Series Implants: CI24R (CA), CI24R (CS), CI24R (ST)
- CI24M Series Implants: CI24M, ABI24M, CI11+11+2M, CI24MH (CI+6+2M)
- CI22M Series Implants: CI22M, CI1+10+11, ABI22M

Custom Sound Pro software is indicated for use with recipients of a Cochlear Nucleus Implant who have any of the following Cochlear Sound Processors:

- Nucleus 8: CP1110
- Kanso® 2: CP1150
- Nucleus 7: CP1000, Nucleus 7 SE: CP1001 and Nucleus 7 S: CP1002
- Kanso: CP950
- Nucleus 6: CP910, CP920
- Nucleus 5: CP810
- CP802
- Freedom: Freedom® Sound Processor, Freedom Hybrid™ Sound Processor

Remote Assist

Remote Assist feature delivers the ability to conduct a remote session via a live video through the Custom Sound Pro software and the Nucleus Smart App. It enables the clinician to make select programming adjustments, enable processor settings and provide counselling via a live video session with their patient.

- The in-app video functionality, chat functionality and enabling patient control of processor settings (ForwardFocus, Volume and Sensitivity), are indicated for use for the recipients of a Cochlear Nucleus implant with the compatible sound processors shown in the table below.
- The remote global adjustment and enabling patient control of processor settings (MVBT- Master Volume, Bass, Treble) are indicated for use for recipients with the compatible sound processors and a compatible Cochlear Nucleus implant shown in the table below.

Remote Assist Functions	Sound Processors	Implants
• Video • Chat • Enabling patient control of processor settings (ForwardFocus [2], Volume and Sensitivity)	• Nucleus 8 • Nucleus 7 • Nucleus 7 SE • Nucleus 7 S[1] • Kanso 2 • Sound processors in Hybrid configuration	Implant compatibility is not relevant for this function
As above plus: • Remote global adjustment • Enabling patient control of processor settings (MVBT)	• Nucleus 8 • Nucleus 7 • Nucleus 7 SE • Nucleus 7 S[1] • Kanso 2	• CI600 Series: CI612, CI622, CI624 and CI632 • CI500 Series: CI512, CI522 and CI532 • CI24RE Series: CI24RE (CA), CI24RE (ST) and CI422

[1:] Compatible only with Nucleus Smart App (Model No: NSA-2) for Android

[2:] ForwardFocus is compatible with Nucleus 8, Nucleus 7 and Kanso 2 Sound Processors

Contraindications

These sections contain the contraindication for the core Custom Sound Pro software and specific contraindication for features within the software.

Custom Sound Pro software

Custom Sound Pro software is not indicated for use with sound processors other than those listed in *Indications*.

Remote Assist

In-App Video and Chat, Enable ForwardFocus (FF)

Remote Assist in-app video, chat and enabling patient control of processor settings (ForwardFocus only) are not indicated for use with sound processors other than those listed in *Indications*.

Remote Global Adjustment, Enable Patient Driven Master Volume Bass Treble (MVBT)

Remote Assist remote global adjustment and enabling patient control of processor settings (MVBT) are not indicated for use for recipients with sound processors and implants other than those listed in *Indications*.

Intended patient population

Custom Sound Pro software is intended for patients implanted with a compatible Cochlear™ Nucleus® implant and with a compatible Cochlear sound processor. There are no restrictions for the intended patient population of Custom Sound Pro software in terms of age, weight, health or other condition.

Clinical benefit

Custom Sound Pro software operates in conjunction with a compatible Cochlear™ Nucleus® implant system. Potential benefits of receiving a Cochlear™ Nucleus® implant system Include:

- Better understanding of speech in quiet
- Better understanding of speech in noise
- Increased satisfaction based on hearing capabilities

Intended users

The intended user group(s) for Custom Sound Pro software are:

- Audiologist/ clinician.

Special training or qualifications

Clinicians using the Custom Sound Pro software must have training in audiology, including an understanding of audiological software functionality, basic understanding of information technology and experience with programming cochlear implant systems.

Use environment

The use environment for Custom Sound Pro software is a non-sterile environment with programming software operating on either a desktop computer, laptop or tablet. This may occur in a clinician's office (audiological clinic), or in another environment where the user and patient are able to focus on the software tasks without distraction and speak to and hear one another clearly (e.g. quiet, enclosed room with minimal ambient noise in the home healthcare environment).

A clinician may also intentionally select a noisier environment to ascertain the effectiveness of a MAP in different conditions.

Cochlear implant compatibility with Custom Sound Pro software

Cochlear™ implant system component combinations compatible with Custom Sound Pro software are listed below:

Cochlear Nucleus® Implants	Cochlear Nucleus® Sound Processors					
	CP1110 - Nucleus® 8 Sound Processor	CP1150 - Kanso® 2 Sound Processor	CP1002 - Nucleus® 7 S Sound Processor	CP1001 - Nucleus® 7 SE Sound Processor	CP1000 - Nucleus® 7 Sound Processor	CP950 - Kanso® Sound Processor
Nucleus® CI632 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI624 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI622 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI612 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI551 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI532 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI522 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI513 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI512 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® ABI541 auditory brainstem implant	✓	✓	✓	✓	✓	✓
Nucleus® CI422 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® Hybrid™ L24 cochlear implant	✓	✓	✓	✓	✓	✓

Cochlear Nucleus® Implants	Cochlear Nucleus® Sound Processors					
	CP1110 - Nucleus® 8 Sound Processor	CP1150 - Kanso® 2 Sound Processor	CP1002 - Nucleus® 7 S Sound Processor	CP1001 - Nucleus® 7 SE Sound Processor	CP1000 - Nucleus® 7 Sound Processor	CP950 - Kanso® Sound Processor
Nucleus® Freedom® CI24RE (CA) Contour Advance® cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® Freedom® CI24RE (ST) Straight cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® Freedom® CI24RE (CS) Contour® cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 24 Contour Advance® CI24R (CA) cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 24k CI24R (ST) cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 24 Contour® CI24R (CS) cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 24 ABI Auditory Brainstem Implant	✓	✓	✓	✓	✓	✓
Nucleus® 24 Double Array implant	✓	✓	✓	✓	✓	✓
Nucleus® 24 CI24M cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 22 cochlear implant			✓ *	✓ *	✓ *	

✓Available

* Requires Nucleus 22 coil

Cochlear Nucleus® Implants	Cochlear Nucleus® Sound Processors					
	CP920 Sound Processor	CP910 Sound Processor	CP810 Sound Processor	CP802 Sound Processor	Freedom® Hybrid™	Freedom®
Nucleus® CI632 cochlear implant						
Nucleus® CI624 cochlear implant						
Nucleus® CI622 cochlear implant						
Nucleus® CI612 cochlear implant						
Nucleus® CI551 cochlear implant	✓	✓	✓	✓		✓
Nucleus® CI532 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI522 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI513 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® CI512 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® ABI541 auditory brainstem implant	✓	✓	✓			✓
Nucleus® CI422 cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® Hybrid™ L24 cochlear implant	✓	✓	✓		✓	✓

Cochlear Nucleus® Implants	Cochlear Nucleus® Sound Processors					
	CP920 Sound Processor	CP910 Sound Processor	CP810 Sound Processor	CP802 Sound Processor	Freedom* Hybrid™	Freedom*
Nucleus® Freedom® CI24RE (CA) Contour Advance® cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® Freedom® CI24RE (ST) Straight cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® Freedom® CI24RE (CS) Contour® cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 24 Contour Advance® CI24R (CA) cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 24k CI24R (ST) cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 24 Contour® CI24R (CS) cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 24 ABI Auditory Brainstem Implant	✓	✓				✓
Nucleus® 24 Double Array implant	✓	✓	✓	✓		✓
Nucleus® 24 CI24M cochlear implant	✓	✓	✓	✓	✓	✓
Nucleus® 22 cochlear implant	✓ *	✓ *				✓ *

✓Available

* Requires Nucleus 22 coil

Note:

- CP1150 - Kanso 2 and CP950 - Kanso Sound Processors do not support acoustic hearing.
- Not all products are approved in all markets.
- Some products may no longer be approved.
- Some products require a regional option to be installed. See your Cochlear representative for information about regional options.

Remote Assistant compatibility with Custom Sound Pro software

The software on the following remote assistants are compatible with these sound processors and can be upgraded with Custom Sound Pro software:

Cochlear Nucleus® Remote Assistants	Cochlear Nucleus® Sound Processors					
	CP1110 - Nucleus® 8 Sound Processor	CP1150 - Kanso® 2 Sound Processor	CP1002 - Nucleus® 7 S Sound Processor	CP1001 - Nucleus® 7 SE Sound Processor	CP1000 - Nucleus® 7 Sound Processor	CP950 - Kanso® Sound Processor
Nucleus® CR110 Remote Assistant						
Nucleus® CR210 Remote Control						✓*
Nucleus® CR220 Intraoperative Remote Assistant						
Nucleus® CR230 Remote Assistant						✓
Nucleus® CR310 Remote Control	✓*	✓*	✓*	✓*	✓*	
Nucleus® Smart App	✓*	✓*	✓*	✓*	✓*	

✓Available

* The Nucleus Smart App, the CR310 and CR210 Remote Control software cannot be upgraded with Custom Sound Pro software

Cochlear Nucleus® Remote Assistants	Cochlear Nucleus® Sound Processors					
	CP920 Sound Processor	CP910 Sound Processor	CP810 Sound Processor	CP802 Sound Processor	Freedom* Hybrid™	Freedom*
Nucleus® CR110 Remote Assistant			✓			
Nucleus® CR210 Remote Control	✓*	✓*				
Nucleus® CR220 Intraoperative Remote Assistant			✓			
Nucleus® CR230 Remote Assistant	✓	✓	✓	✓		
Nucleus® CR310 Remote Control						
Nucleus® Smart App						

✓Available

* The Nucleus Smart App, the CR310 and CR210 Remote Control software cannot be upgraded with Custom Sound Pro software

Note:

- CP1150 - Kanso 2 and CP950 - Kanso Sound Processors do not support acoustic hearing.
- Not all products are approved in all markets.
- Some products may no longer be approved.
- Some products require a regional option to be installed. See your Cochlear representative for information about regional options.

System requirements

	Minimum system requirements	Recommended system requirements
Operating system	Windows® 10 (64-bit) Version 2004 or Windows 11 21H2 (Note: 32-bit versions of Windows 10 are not supported)	Windows 10 (64-bit) Version 22H2 or Windows 11 22H2 or later (Note: 32-bit versions of Windows 10 are not supported)
Processor	6th Generation Intel® Core™ i5 Processor i5 6400/AMD Ryzen 5 2600	9th Intel Core i5 9500 Processor/ AMD Ryzen 5 3600 or faster
RAM	8 GB of DDR3 or higher	12 GB DDR4 RAM
Hard drive	Solid State hard drive with 10 GB of available space	HDD 10 GB Free Solid State NVMe PCIe
Screen resolution	1920 x 1080	1920 x 1080
Screen size (for tablet use)	12 inches or higher	12 inches or higher
USB port	2 x USB A ports	2 x USB A ports
Wireless	Bluetooth® 4.0 required for Cochlear™ Wireless Programming Pod	Bluetooth 4.0, or higher, required for Cochlear Wireless Programming Pod
SQL Server®	SQL Server 2014	SQL Server 2019
	Microsoft SQL Server Compact 4.0 x 64 ENU or Microsoft SQL Server Compact 4.0 x 86 ENU	Microsoft SQL Server Compact 4.0 x 64 ENU or Microsoft SQL Server Compact 4.0 x 86 ENU

To participate in Remote Assist sessions the computer system running the Custom Sound Pro software will also need the following:

Video	Integrated laptop camera or USB 2.0 video camera
Voice	Compatible microphone and speakers, headset with microphone, or equivalent device
Network	A stable internet connection

It is important to keep the Windows® operating system up to date. The computer or tablet must be capable of receiving Windows updates.

Any computer system connected to the Cochlear™ system, when used in programming mode, should meet FCC 47CFR Part 15 Class B and CISPR22 Class B emissions requirements. Consult the documentation provided by the computer system manufacturer to ensure compliance, prior to connecting any Cochlear device.

Installation and upgrade for Custom Sound Pro software

Please refer to the *Custom Sound Pro software- Installation Guide* for full installation instructions.

When installing or upgrading Custom Sound Pro software , the computer may need to be restarted. Ensure you close any applications before installing the software.

When installing Custom Sound Pro software, the user account used for installation must be added to the Windows Administrator group. When creating a database connection using the Windows integrated security option, use the CochlearClinical user account so that clinicians can start Custom Sound Pro software without experiencing any errors related to connecting to the database.

Upgrading to Custom Sound Pro software from earlier versions may require a database upgrade. If your clinic uses a network database, careful planning is required to ensure that all computers with Custom Sound Pro software can connect to the database.

Security considerations

Medical device security is a shared responsibility between medical device manufacturers and health care facilities. Custom Sound Pro software includes a number of built-in features that can help protect the integrity of information such as:

- Removal of patient-identifiable details from records when anonymously exported from the Cochlear database
- Validation checks within the Cochlear database to maintain data integrity
- A backup utility for the Cochlear database
- Encryption of CDX files that are exported from Custom Sound Pro software
- Code signing of installer executables
- User names and passwords to control access to Custom Sound Pro software

To help reduce the risk of unauthorised access to Custom Sound Pro software it is best practice to implement an IT security policy within the healthcare facility that considers the following items:

- Windows operating systems including the latest security updates from Microsoft®
- Anti-virus software including the latest updates available from the vendor with regular scanning of hard disk
- Scanning of USB storage devices for malware or viruses before connecting to the computer running Custom Sound Pro software
- Firewalls to protect computers running Custom Sound Pro software that are accessible to the Internet
- A password policy that requires strong passwords that are changed regularly and are applied to user accounts on computers where Custom Sound Pro software is installed and network-connected computers where the Cochlear database is installed
- Locking computers when unattended
- Regular backups of the Cochlear database

Cochlear also suggests following the recommendations from the **Security practices** section of the ***Custom Sound Pro software- Installation Guide***.

Login

When you start Custom Sound Pro software the Login window opens. Use the Login window to log in to Custom Sound Pro software.

Note: Login is not required when the Cochlear Account Administration Tool (CAAT) has been set up. For more information see the section Cochlear Account Administration Tool (CAAT).

Display the Hardware Options window to set the Ports, Protocols, and Application Services (PPS) values for the Custom Sound Pro software communication port.

Task steps:

1. Double-click the Custom Sound Pro software icon located on the desktop, or from the Start menu, under Cochlear.
2. Select your clinician name from the **Clinician** drop-down list.
3. Type your password in the **Password** box.

   Note: A password is only required if one has been set up in the Clinician Details and Preferences window.
4. Click **Login**.

   The Patients screen displays.

Result:

- The Custom Sound Pro software application is active with the user logged on.

Cochlear Account Administration Tool (CAAT)

The Cochlear Account Administration Tool (CAAT) is an optional user authentication system based on Microsoft® Active Directory®. Clinician accounts can be set up for Custom Sound Pro software and any other tool that uses Custom Sound Pro software authentication. When configured, the clinician will not be required to log in to Custom Sound Pro software.

Note: You must install a regional key to access CAAT.

Hardware Options

Sets the Ports, Protocols, and Application Services (PPS) values for the Custom Sound Pro software communication port.

Training mode

Training mode simulates a connection to a sound processor and allows you to learn the features of Custom Sound Pro software without requiring physical hardware. Training mode uses a separate database to prevent real patient data from being unintentionally edited.

Training mode includes a test patient. You can add new patients to the training mode database.

Task steps:

1. Double-click the Training Custom Sound Pro software icon located on the desktop, or from the Start menu, under Cochlear.
2. Set the sound processors you want to use in training mode.
3. Click **Start Training Mode**.

   The Patient List screen displays.

Result:

Custom Sound Pro software is open in training mode, indicated by the training mode icon  .

Patient List

The Patient List screen displays automatically when you log in to Custom Sound Pro software, showing a list of all non-archived patients contained in the Custom Sound Pro software database.

Sort the list of patients into ascending or descending order by clicking the column heading you want to sort by. Filter the list by typing text into the **Search** box. You can search using patient information such as given name, family name and date of birth.

You can specify the information shown in the Patient List screen using the **Patient List** tab of the Clinician Details and Preferences window.

Create a patient

To program a patient's sound processor, perform intraoperative testing or create a patient record in Custom Sound Pro software.

Task steps:

1. Click **Add** in the Patients screen.

   The Patient Details window displays with the **General** tab selected.

2. Type the patient's name in the **Given Name** and **Family Name** boxes, and select a date in the **Date of Birth** box.

   Note: You must enter the given name, family name, and date of birth of the patient before you can proceed.

3. Click **Next**.

   The **Hardware** tab displays.

4. Use the drop-down lists under **What's on the right side?** or **What's on the left side?** and select the corresponding device type.

   Note: You must select an option for both sides before you can proceed.

   a. For a cochlear implant, choose the correct model, enter other details as appropriate, and click **Save**.

      Note: Ensure the correct implant is selected. Incorrect implant selection may result in excessive or unsafe charge being delivered to the patient.

      Note: For an activation session, hardware details are able to be added later in the programming session.

   b. For a hearing aid, choose the hearing aid model from the Hearing aid type list.

   c. If one side is unaided, select **Unaided (PTA ≤ 30dB) SSD** for single-sided deafness, or **Unaided (PTA > 30dB)**.

5. Click **Next**.

6. The Audiogram tab appears, displaying right and left audiograms.
7. Click **AC** 

to select air conduction thresholds, **BC** 

to select bone conduction thresholds or **Aided** 

to select aided thresholds.
8. Click the audiogram to enter the thresholds.

   Use the right-click menu to mark a point as no response.
9. Click **Next**.
10. The Contact tab displays.
11. Enter the patient's Email address, Mobile and/or Telephone number, and address information if available.
12. Click **Save** to save the changes and close the Patient Details window.

Result:

- The Dashboard screen displays, commencing a fitting session for the newly created patient.

Note: For Freedom Hybrid sound processors, CP900 Series, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 and CP1110 - Nucleus 8 Sound Processors in Hybrid mode, the audiogram must be entered in the **Audiogram** tab to enable acoustic levels to be prescribed.

Edit a patient

Existing patients can be edited as required.

Task steps:

1. Click on a patient in the Patients screen and click **Edit**.

   The Patient Details window displays with the **General** tab selected.
2. Update the General tab controls as required.
3. Click **Save** to save your changes and close the Patient Details window,

   or:

   select the **Hardware** tab to update the patient's devices:
4. To remove a previously specified Cochlear Implant entry:
   a. Click the implant name.

      The Implants window displays.
   b. Change the **Status** from 'Implanted' to 'Explanted'.
   c. Click **Save**.

      The Hardware tab displays again showing the status of the side that previously had the implant as 'Not Specified'.

      Note: When the Implants window is displays in future for this side and patient, the details of the explanted implant are included.
5. To add a device:
   a. Use the drop-down lists under **What's on the right side?** or **What's on the left side?** and select the corresponding device type.

      Note: You must select an option for both sides before you can proceed.
   b. For a cochlear implant, choose the correct model, enter other details as appropriate, and click **Save**.

      Note: Ensure the correct implant is selected. Incorrect implant selection may result in excessive or unsafe charge being delivered to the patient.
   c. For a hearing aid, choose the hearing aid model from the Hearing aid type list.
   d. If one side is unaided, select **Unaided (PTA ≤ 30dB) SSD** for single-sided deafness, or **Unaided (PTA > 30dB)**.

6. Click **Save** to save your changes and close the Patient Details window,

   or:

   select the **Audiogram** tab to update the patient's right and left audiograms:

   a. Click **AC** 

   to select air conduction thresholds, **BC** 

   to select bone conduction thresholds or **Aided** 

   to select aided thresholds.

   b. Click the audiogram to enter the thresholds.

      Use the right-click menu to mark a point as no response.

7. Click **Save** to save your changes and close the Patient Details window,

   or:

   select the **Contact** tab to update the patient details.

8. Change the patient's Email address, Mobile and/or Telephone number, and address information as required.
9. Click **Save** to save your changes and close the Patient Details window.

Result:

- The patient's audiogram data is now available in Custom Sound Pro software and will be used to calculate the amount of amplification.

Create audiogram

You can manually create an audiogram in Custom Sound Pro software from pure tone audiometric data and /or bone conduction data that will then be available during patient sessions.

Note: For Freedom Hybrid sound processors, CP900 Series, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, and CP1110 - Nucleus 8 Sound Processors in Hybrid mode, the audiogram must be entered in the **Audiogram** tab to enable acoustic levels to be prescribed.

Task steps:

1. Select a patient in the Patients List screen and click **Edit**.

   The Patient Details window displays with the **General** tab selected.

2. Select the **Audiogram** tab.

   The Audiogram tab appears, displaying right and left audiograms.

3. Click **AC** 

to select air conduction thresholds, **BC** 

to select bone conduction thresholds or **Aided** 

to select aided thresholds.

4. Click the audiogram to enter the thresholds.

   Use the right-click menu to mark a point as no response.

5. Click **Save** to save the audiogram entries and close the Patient Details window.

Result:

- The patient's audiogram data is now available in Custom Sound Pro software.

Work with Implant ID

The Implant ID feature in the CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series, CP800 Series, Freedom Hybrid and Freedom sound processors allows the sound processor to be associated with a specific implant or implant type. This reduces the risk of unintended stimulation due to mixing up sound processors between patients or between ears. Implant ID is not available for other sound processors.

Once you write a program to the sound processor, the status bar displays the padlock icon, indicating that Custom Sound Pro software has programmed the sound processor with Implant ID. Implant ID is not activated in the sound processor until a program is written.

The padlock icons are colour-coded to indicate the level of protection:

-  **Gold:** the sound processor that is programmed for use with this specific implant will not stimulate another implant. Gold padlock protection is not available for Nucleus 24, Nucleus 22 or Freedom (CI24RE) implant types prior to serial number 1020050437005.
-  **Green:** a sound processor that is programmed for use with a specific type of implant will not stimulate another implant which is a different type.
-  **Grey:** Implant ID has been disabled by a clinician.
- **No icon:** Implant ID is not available.

Where Implant ID is disabled or not available, a sound processor that is placed on the wrong implant could result in unintended stimulation.

If you experience problems with Implant ID, the auto correct option allows you to clear any previously recorded ID value and re-read the ID of that implant (excluding Nucleus 24 and Nucleus 22 implant types). Should the problem persist, Implant ID can be disabled for all implant types excluding Nucleus 22 implants.

Task steps:

1. Ensure the coil is on the patient's implant.
2. Click the **Hardware** tab in the Patient Details screen.

   The Hardware tab displays showing the patient implant.
3. Click  **Implants**.

   The Implants window displays showing the **Model**, **Status**, **Implant Date** and **Initial Stimulation** for the implant.
4. Click **Options**.

   The Implant ID Options window displays
5. Click **Auto Correct** or **Disable Implant ID** as required.
6. Click **OK** to apply the selected option and close the Implant ID Options window.

   The Implants window displays.
7. Click **Save** to save the changed Implant ID status.

Result:

- The Implant ID has been corrected or disabled.

  Note: To re-enable Implant ID, ensure the coil is on the patient's implant, open the Implant ID Options window and click **Enable Implant ID**, then apply and save the change.

Patient Details

Specifies information including:

- Patient identification (Name, Date of Birth, Gender, Cochlear ID, National ID, and Clinic's Patient Reference ID). A patient can be created with identification of just Name and Date of Birth.
- The model of implant the patient has been fitted with and the side on which the implant has been fitted.

  You can also specify other hearing devices such as bone conduction implants and hearing aids.
- Audiograms for right and left ears. To set acoustic parameters for a patient, you must enter the patient's audiogram.
- Patient contact information (Email, Mobile, Telephone, Street, City/Suburb, State/Province, ZIP/Postcode, and Country).
- Surgical data imported into Custom Sound Pro software. This can include the results of a placement check, estimated skin flap thickness, insertion time, angular depth, cochlea opening and any surgeon's notes.

Export a patient

A patient’s details can be exported to a file, which can then be imported into another Custom Sound Pro software database. The Anonymous Export function removes the patient's personal details from the exported file.

Task steps:

1. Click the desired patient in the Patient list.
2. Click the **Patient** menu and select **Export** or **Export Anonymously**.

   The Save As window displays.
3. Navigate to the desired file location.
4. Enter an appropriate file name or leave the default file name in place.
5. Click **Save**.

Result:

- The patient details are saved to the specified location as a Cochlear Data Exchange File (.cdx*).

Import a patient

Patient files that have been exported from another Custom Sound Pro software database can be imported into the patient list.

Task steps:

1. Click the **Patient** menu and select **Import patients**.

   The Open window displays.
2. Navigate to the Cochlear Data Exchange File (.cdx*) you want to import and click on it.
3. Click **Open**.

Result:

- The file is imported into Custom Sound Pro software. A new patient is created, or, if the patient already exists, the current details are overwritten.

Manage Patients

Archived patient records which are not to be used, and restores previously archived patient records so they can be used again.

Archive a patient

Patients who are no longer active can be archived from the Patient list provided a session is not open.

Note: An archived patient is not deleted from the database, and can be restored at a later date if required.

Task steps:

1. Click on **Patient > Manage** in the Menu bar.

   The Manage Patients screen appears.
2. Click on the patient to be archived in the Active list.
3. Click the **Archive** button on the right hand side of the screen.

Result:

- The patient record moves from the Active list to the Archived list and can no longer be selected in Custom Sound Pro software.

Restore a patient

You can restore patient data that was previously archived.

Task steps:

1. Click on **Patient > Manage** in the Menu bar.

   The Manage Patients window displays.
2. Sort patients by clicking the header of the column you want to sort by, or filter the list using the **Search** box.
3. Click the patient you want to restore in the **Archived** list.
4. Click **Restore**.
5. Click the **Close** button  to close the Manage Patients window.

Result:

- The patient moves from the Archived list to the Active list, and displays on the Patient list screen.

Dashboard

Use the Dashboard screen for an at-a-glance overview of patient information. This includes name, age, gender, audiograms, usage data including time on air, session history records, and notes taken during the previous session. The dashboard also shows notification that new technology is available if the patient's sound processor is more than 5 years old. The screen also provides visual cues indicating whether a processor is connected and when the patient goes on or off air.

You can open the Audiogram tab from the Dashboard in add / edit mode when the patient is Off Air. This allows you to create or modify multiple audiograms, and update a Hybrid prescription based on a new or modified audiogram.

In most cases, impedance measurement automatically runs on supported implants to turn off faulty electrodes and display electrode status. Click the Impedances electrode indicator to display the Impedance Measurement Details window.

If the patient already has an active MAP, then Custom Sound Pro software automatically goes live on that MAP in the dashboard.

Connect a sound processor

You can connect a sound processor to a computer via the appropriate programming interface:

- **Wireless Programming Pod:** for use with CP900 Series and CP800 Series Sound Processors, CP1000 - Nucleus 7, CP1001 - Nucleus 7 SE, CP1002 - Nucleus 7 S, CP1150 - Kanso 2 and CP1110 - Nucleus 8 Sound Processors, provides wireless connectivity between a sound processor and a computer running Custom Sound Pro software, using Bluetooth® technology. For instructions on connecting and using the Wireless Programming Pod, see the Cochlear Wireless Programming Pod User Guide.

  Note: There are two models of Wireless Programming Pod, one for CP800 Series and CP900 Series Sound Processors and one for CP1000 - Nucleus 7, CP1001 - Nucleus 7 SE, CP1002 - Nucleus 7 S, CP1150 - Kanso 2 and CP1110 - Nucleus 8 Sound Processors. The Wireless Programming Pod for CP1000 - Nucleus 7, CP1001 - Nucleus 7 SE, CP1002 - Nucleus 7 S, CP1150 - Kanso 2 and CP1110 - Nucleus 8 Sound Processors has the number "7" engraved under the LED.

- **Programming Pod:** for use with CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series, CP800 Series, Freedom Hybrid, and Freedom Sound Processors, provides USB connectivity and physically connects a sound processor and computer via a USB cable.

Task steps:

To connect a sound processor:

1. Connect the Wireless Programming Pod or Programming Pod to the computer on which Custom Sound Pro software is running.

   The Wireless Programming Pod must be paired to the computer running Custom Sound Pro software before it can be used to program a sound processor. For instructions on connecting and using the Wireless Programming Pod, see the Cochlear Wireless Programming Pod User Guide.

   The Programming Pod must be connected to a powered USB port and not a USB port on the monitor or keyboard.

    **Note:** The CP950 - Kanso Sound Processor must have batteries inserted before it is connected to a computer for programming.

2. Connect the sound processor to the programming interface.

    **Note:** Ensure you have the correct sound processor for the patient.

3. If Custom Sound Pro software does not automatically detect the sound processor, click the **Processor** menu and select **Connect**.

4. If the firmware of the connected sound processor is not supported by the current version of Custom Sound Pro software, the firmware is automatically updated. If any existing programs in the sound processor are incompatible with the updated firmware, the Update Processor prompt displays:

   - Click **Erase Programs and Update** to erase the unsupported programs and update the firmware.
   - Click **Disconnect** to disconnect the sound processor from Custom Sound Pro software without updating the firmware.

Result:

- The status bar indicates the sound processor is connected, and displays any programs that have been written to the programming slots.

   **Note:** To disable communication between Custom Sound Pro software and an attached sound processor, click the **Tools** menu and select **Disable Pod Communication**.

Reset a sound processor

You can reset a sound processor and clear all current programs from the programming slots.

Note: The sound processor must be off air to be reset.

Task steps:

1. Right-click on the **Sound Processor** icon (or) on the status bar and select **Reset**.

   A confirmation message appears.
2. Click **Yes** to confirm.

Result:

- The sound processor settings are removed.

Select a sound processor

You can select a processor to associate with a cochlear implant on the Dashboard screen. Custom Sound Pro software automatically runs impedance measurement on supported implants when the processor is selected and displays the result.

Task steps:

1. Select a processor from the drop-down list below the named cochlear implant.

   If prompted, confirm that the coil is placed on the correct implant side.
2. Click **Yes** if the nominated side is correct.

   In most cases, Impedance runs automatically for the selected implant.

Result:

- The impedance measurement result displays as a line of dots representing tested electrodes:

   functional electrodes display in green, while turned off electrodes display in red.

Remote Assist

Remote Assist delivers the ability to facilitate a remote session with patients via a live video session. It gives you the ability to make selected programming adjustments, enable processor settings and provide counselling to patients through the Custom Sound Pro software and the Nucleus Smart App without the need for patients to attend an in-clinic appointment, or having to receive equipment from the clinic for a remote programming session.

Remote Assist allows you to:

- Establish a live video session with a patient from within the Custom Sound Pro software
- For compatible implants, make global adjustments to the patient's MAP.
  For more information on compatible implants please see the *Remote Assist* section in *Indications*.
- Enable patient driven Master Volume, Bass, Treble and ForwardFocus settings

Remote Assist requires a regional option to be installed. See your Cochlear representative for information about regional options.

Important information

Note: Patients need to be enrolled in the Cochlear Remote Check program to be able to use Remote Assist. For more information on how to enrol a patient please see the *Remote Check - Nucleus Smart App - Quick Guide for Clinicians*.

Note: As with the Custom Sound Pro software, Remote Assist cannot modify a patient's MAP if it uses atypical parameters. MAPs using atypical parameter will be displayed as read only on the Remote Assist Adjust screen. Some examples atypical MAP parameters are:

- Mixed pulse widths
- Pulse widths greater than 100 µs
- More than 10 electrodes turned off
- Non-monopolar stimulation modes (i.e. common ground, bipolar etc)
- Mixed stimulation modes
- Non-default channel to electrode MAPs or MAPs with channel re-ordering
- MAPs with narrow (<10CL) dynamic ranges

Connect

Remote Assist session connections are launched from the patient dashboard for eligible patients.

Note: Patients need to be enrolled in the Cochlear Remote Check program to be able to use Remote Assist. For more information on how to enrol a patient please see the *Remote Check - Nucleus Smart App - Quick Guide for Clinicians*.

Task steps:

1. Select and open the eligible patient from the patient list.
2. Click **Start Remote Assist** on the patient dashboard.

   Or,

   Click **Log in to Remote Assist** and you will be prompted to log in to myCochlear Professional.
3. Choose your audio and video settings.
4. Click **Start session**.

   You will be directed to a lobby to wait until both the patient and the clinician have joined the session.
5. When both parties have joined the session, video and chat functions will be available.

   Note: To make adjustments the patient will need to disable streaming. Please have them refer to their Pairing Guide for steps to disable streaming. Do not have them disable Bluetooth.
6. Click **Connect and adjust** to make adjustments or **Finalise session** to finish the Remote Assist session.

Result:

The Remote Assist session will start with video and chat.

Adjust

Use the Adjust screen in the Remote Assist feature with live speech to set the master volume until sounds are comfortably loud for the patient, and then to set bass and treble levels to adjust the sound quality they hear.

You can use the Adjust screen to balance the loudness of bilateral MAPs. Adjust each side individually to ensure the same perceived volume and sound quality and set overall loudness for each to achieve a comfortably loud sound level.

Adjust Master Volume to control the overall loudness of all sounds heard by your patient and ensure that the patient perceives all sounds at the same comfortably loud level.

Adjust bass to increase or decrease the volume of low pitched or deep sounds. Adjust treble to increase or decrease the volume of high pitched sounds.

Task steps:

1. Open the Adjust screen.
2. If the patient is fitted with two cochlear implants adjust levels for one MAP at a time by selecting either Right  or Left  to specify the MAP to be adjusted.
3. Click **Master Volume**.
4. Use the Up  and Down  buttons to increase or decrease the loudness.
5. Click **Bass** or **Treble**.
6. Use the Up  and Down  buttons to increase or decrease the level.

   Note: For CI500 Series, CI422, Freedom (CI24RE) and Nucleus 24 implants, if you exceed the compliance levels on one or more channels, a message displays to indicate that there are channels out of compliance. To bring the MAP into compliance, click OK. Use the Adjust screen to adjust levels to achieve a comfortable loudness level for the patient.

Result:

- The master volume, bass or treble are adjusted.

Finalise

Use the Finalise screen to adjust processor settings and save the MAP to a sound processor.

Tip: The MAP number is shown in the bottom left corner of the program icons.

Note: When a new Remote Assist session is started, all MAPs on the sound processor will be opened remotely and loaded into the appropriate slots on the Finalise screen. All existing program and processor settings on the sound processor will automatically be loaded and will appear in the relevant windows when these are displayed.

1. Ensure the MAP that you want to save to the sound processor is selected.
2. Adjust processor settings:
    a. Click **Processor Settings**.

       The Processor Settings screen displays. When the patient has two implants, the Processor Settings window displays the information for each in a side by side layout, allowing you to view and edit both to ensure they are as similar as possible.

    b. Review the processor settings and make any required changes.
    c. Click **Save**.
    d. Click Save to save any changes.

       Tip: If you did not make any changes, click **Cancel** to close the Processor Settings window.
3. Click **Save** to write the programs to the sound processor.

   A **Save successful** message appears when the configuration has been written to the sound processor.
4. Click **Clinical Report** and then print the report if you want to provide a report for other clinicians or for clinical records.
5. Click **Hang Up + End session** to exit the video and chat and end the fitting session or **End session** end the fitting session if the patient has already left the call.

   If any unsaved changes to MAPs are present, a save confirmation message appears. Click **Yes** to save MAP changes.

   The Patients screen displays, and the Session Details and Take Home reports display in separate tabs in the Report Viewer.
6. Click the **Close** button to close each of the reports in the Report Viewer.

View usage data for CP900 Series or later Sound Processors

Custom Sound Pro software comes with a wireless data logging capability where key usage information is displayed at a glance to easily track patients' hearing progress. The collected data provides insights on user compliance and information to assist in managing programs. The CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 and CP900 Series Sound Processors continuously and automatically record the input to the microphones, and the buttons and settings used by the patient, which are then provided mostly as a daily average proportionate percentage.

The data usage shown is for individual sound processors. If a patient has multiple sound processors per ear, usage data is collected and shown separately for each sound processor.

To view usage data:

1. Select the patient from the list of patients on the Patient screen.
2. Click the View Usage Data button (at the bottom left of the screen), or click Patient in the dropdown menu (at the top of the screen) and select View Usage Data.

   The Usage Data Viewer can be accessed at any point when the patient's record is open.

   The Usage Data Viewer panel displays pie charts showing daily averages for Time on Air (for Nucleus 22 implants, this is Time On), Scenes and Program usage.

Note: For a bilateral patient two sets of data display.

3. To view Loudness data, click on the Show button to the left of the Scenes graph and select Loudness. The Loudness data displays.
4. To view Accessory usage, click on the Show button to the left of the Program usage graph and select Accessory usage. The Accessory usage data displays.

Trend graphs: For Time on Air (for Nucleus 22 implants, this is Time On), Scenes and Loudness, a trend graph is displayed under the pie chart display data for the last 5 periods. If the mouse is rolled over each of these graphs, they display the length of each period in days.

Note: Each period corresponds to the dates the sound processor is connected to Custom Sound Pro software.

Volume or Sensitivity can be selected by moving the rollover switch under the Program usage pie chart. This controls whether volume or sensitivity information is shown when the mouse is rolled over the chart.

Accessory Usage: If the mouse is rolled over the Accessory usage pie chart, the number of uses of the three most used accessories during the last period is displayed. Usage of all accessories is shown in the table below the pie chart.

Note: The sound processor does not need to be connected to see previous periods. Up to five periods are shown in the Usage Data Viewer.

Patient Goals

Use the Patient Goals screen to record and track patient goals, and to view your patients hearing achievements and the details of all previously set goals.

The screen contains two tabs:

- **Current Patient Goals** specifies up to five goals that the patient is currently trying to achieve.
- **Goal History** lists the patient's achievements and all previously set goals. This helps you to track and highlight their progress, and to see what has worked previously for goals in the same category.

Goals automatically appear in the patient's take-home report, so they can review them at home.

Manage patient goals

Use the Current Patient Goals tab of the Patient Goals screen to encourage focus on the patient and achieving their goals.

You can have up to five goals open at any one time, each with a goal statement, an action plan, a category label chosen from a pre-defined set, and an ability rating indicating the current level of achievement.

Goals can be edited, deleted or marked as complete, and the goal actions appear in the patient's take home report.

From the icons at the top right of the Patient Goals screen you can also view the patient's current Usage Data and create session notes for recording goals.

Task steps:

1. Click on **Patient Goals** in the Dashboard screen.

   The Patient Goals window displays with the Current Patient Goals tab selected.

   To add a goal:

   a. Click **Add**  icon.
   b. Select a Category from the drop-down list.
   c. Describe the patient goal.
   d. Describe the action plan to achieve the goal.
   e. Select an **Ability Rating** to indicate the current completion of the goal.

To edit a goal:

a. Select a different Category from the drop-down list.
b. Update the patient goal or action plan text.
c. Select a new Rating.

Previous ratings will appear in a lighter shade.

To complete a goal:

- Select the **Done** check box beside the goal to indicate it is complete.

  The goal remains visible in the Goal History tab.

To remove a goal:

- Click the **Delete**  icon.

  The goal is deleted and can no longer be viewed.

2. Click **Save** to save any changes made to goals and close the Patient Goals screen.

Result:

- The patient's current goals are accurately recorded.

View goal history

View all previously set patient goals.

Task steps:

1. Click on **Patient Goals** in the Dashboard screen.

   The Patient Goals window displays with the Current Patient Goals tab selected.

2. Click the **Goal History** tab.

   All previously set goals display, showing their start dates, achievement or deletion dates and goal categories.

3. Click on a goal to expand it and display the goal description, action plan, last ability rating, and the **Done** check box.
4. Uncheck the **Done** check box to make it a current patient goal.
5. Click **Save** to save any changes made in patient goals and close the Patient Goals screen.

Result:

- The patient's current goals are accurately recorded.

View session history details

The details of each programming session are saved in Custom Sound Pro software, and previous sessions can be viewed in the Session History window. Notes can be added or updated for each session.

Task steps:

1. Click on **Session > Session History** in the Menu bar.

   The Session History window displays.

2. Click a session in the Session History list.

   The Sound Processor panel displays the environment and MAP number for each program written to the sound processor during the selected session.

3. Select from the following actions in the Sound Processor panel:

   - To view the volume and sensitivity settings for an environment, place the cursor over the desired **Environment** icon.
   - To view the settings for an environment in the Program Settings window, click the desired **Environment** icon.
   - To open a MAP in the Set Levels screen, click the desired **MAP** link.
   - To view the settings for a CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series or CP800 Series Sound Processor in the Processor Configuration window, ensure the correct sound processor is selected and click **Sound Processor Configuration**.
   - To restore the programs from the selected session to the connected sound processor, click **Save to Processor**.

4. To add Notes or edit existing Notes for the selected session, type the desired text in the Notes panel.

5. To print a report for the selected session, click **Print Report** or **Print Patient Take Home Report** in the Session panel and use the Print toolbar on the Report viewer.

6. To compare programs:
    a. Hold down the **Ctrl** key and click the sessions you want to compare in the Session History list.
    b. Click **Compare Programs** in the Session panel.

       The Select Programs window displays a list of available programs for each programming session.
    c. Select the check boxes of the required programs and click **Compare**.

       The Program Comparison window displays the differences between the MAPs and the environments.
    d. To test a program using live voice testing, select the sound processor from the **Processor** drop-down list and click the **Go Live** button  corresponding to the desired program. Click the **Stop** button  to stop live voice testing.
    e. To print the program comparison details, click **Print**. Type any Notes to be added to the report in the Program Comparison Report window and click **Report**.

       The program comparison details display in the Report viewer and can be printed using the Print toolbar.
7. Click the **Close** button  to close the Session History window.

Result:

- Any changes made to the session Notes are saved.

Compare programs

The details of each programming session are saved in Custom Sound Pro software, and previous sessions can be viewed in the Session History window. Notes can be added or updated for each session.

Task steps:

1. Click on **Session > Session History** in the Menu bar.

   The Session History window displays.

2. Hold down the **Ctrl** key and click the sessions you want to compare in the Session History list.

3. Click **Compare Programs** in the Session panel.

   The Select programs for comparison window displays a list of available programs for each programming session.

4. Select the check boxes of the required programs and click **Compare**.

   The Program Comparison Report window displays the differences between the MAPs and the environments.

5. To test a program using live voice testing:

   a. Select the sound processor from the **Processor** drop-down list.

   b. Click the **Go Live** button  corresponding to the desired program.

   c. Click the **Stop** button  to stop live voice testing.

6. To print the program comparison details, click **Print**.

7. Type any notes to be added to the report in the Program Comparison Report window and click **Report**.

Result:

- The program comparison details display in the Report viewer (with notes if added) and can be printed using the Print toolbar.

Measure

The Measure screen contains the Impedances screen and the AutoNRT® screen which you can use to carry out impedance and AutoNRT measurements.

Patient AutoNRT and impedance data can also be imported into Custom Sound Pro software. Prior to importing the data, it needs to be exported from an intraoperative remote assistant and saved to a location where it can then be imported from.

Note: This option is not available from CR110 or CR230 Remote Assistants.

Impedances

Use the Impedances screen to test an implant by measuring the impedance for each implant electrode and detecting any short- or open-circuit electrodes.

If impedances were measured automatically when you selected the sound processor on the Dashboard, the Impedances screen shows the electrodes that were measured. If there are no results, click Measure to measure impedances.

Click the **Customize** button to display the Impedance Measurement Options screen and choose stimulation modes, include or exclude electrodes from measurement, add notes to individual electrodes, or generate a report displaying the impedance measurement results.

Click the **Details** button to display the Impedance Measurement Details screen showing the results of the impedance measurement, and to turn off electrodes if required. If you turn off an electrode, the impedance measurement will run automatically when you close the Impedance Measurement Details screen. Click on an electrode in the schematic diagram to display the Impedance Measurement Details screen with the selected electrode highlighted.

Click the **Today's Session Notes** icon to display an area which is available for you to record information about the patient's session. You will be able to view these notes in future sessions with the same patient.

Notes:

- Impedances do not auto-run for ABI implants.
- Implants are automatically set off air while the Impedances screen is displayed.

Change measurement settings

You can specify the way in which electrode impedances are measured using the Impedance Measurement Options screen.

Custom Sound Pro software measures impedances using the following stimulation modes:

- **Common Ground (CG):** one electrode is designated as active while the remaining electrodes together form the indifferent 'electrode'.
- **Monopolar (MP1, MP2 and MP1+2):** one or both of the extracochlear indifferent electrodes is used in combination with intracochlear active electrodes.

An implant test detects the following short- or open-circuit electrodes:

- **Intracochlear electrodes:** detects short- and open-circuit electrodes in Common Ground mode, and open-circuit electrodes in Monopolar modes.
- **Extracochlear electrodes:** detects open-circuit electrodes in Monopolar modes, but does not detect short-circuit electrodes between extracochlear electrodes.

Task steps:

1. Click the **Customize** button.

   The Impedance Measurement Options screen appears.
2. Select the **Stimulation Modes** (Common Ground, Monopolar 1, Monopolar 2, Monopolar 1+2) which determine which electrodes are stimulated.
3. Select or clear the **Electrodes** check boxes as required.

   When selected, the electrode is measured.
4. Click **OK** to save the selected options.

Result:

- The impedance measurement options are set.

Measure impedances

You can perform an impedance implant test during an intraoperative or postoperative session. By default, Custom Sound Pro software measures the impedance of each turned off electrode in CG, MP1, MP2 and MP1+2 stimulation modes.

Task steps:

1. (Intraoperative testing only) Place the coil in a sterile bag on the skin flap covering the implant.
2. To change the default measurement settings, click **Customise** in the Impedance screen.

   The Impedance Measurement Options window displays.
3. Select or clear the desired check boxes to specify which stimulation modes and electrodes to test, and click **OK**.
4. Click **Measure**.

Result:

- The electrodes for which successful impedance measurements were obtained in all stimulation modes display in green  . Any electrodes for which short- or open-circuits were detected display in red  , and are automatically turned off in postoperative mode only. Turned off electrodes display in brown  in subsequent programming sessions.

View impedance measurements

Impedance measurements are stored in Custom Sound Pro software and can be viewed at any time.

Task steps:

1. Click **Details** in the Impedances screen.

   The Impedance Measurement Details window displays the impedance measurements for each electrode in each stimulation mode.

   Details can be filtered by History (number of past measurements to display) and Mode (CG, MP1, MP2 and MP1+2)

2. Use the check boxes under View to show or hide results for a selected mode on a particular implant test date.
3. Hover over the results for an electrode to see more information.
4. To turn on or turn off an electrode, right-click the electrode and choose **Turn off/on electrode**.

   The Add note to electrode window displays. Type reasons for turning off/on electrode in Notes next to the date stamp and click **Save and Close**. Electrode Notes can be viewed by placing the cursor over the corresponding turned off electrode.

5. To print a report of the measurement details, click **Report** and use the Print toolbar on the Report viewer.

Result:

- The Impedance Measurements window displays a list of the impedance measurements obtained for the implant.

Note:

- Electrodes that have been automatically turned off display with an open  or short  symbol. Electrodes that have been manually turned off display with a cross symbol  .
- This screen can also be accessed by clicking the **Implant** menu and select **Impedance Measurement History**.

Turn electrodes on or off

You can use the Impedance Measurement Details tab to manually switch off implant electrodes, and to attach a note explaining the reason for switching them off.

Manually turned off electrodes are not used when measuring impedances in postoperative mode or when creating new MAPs. Automatically turned off electrodes are retested when an impedance test is performed.

Task steps:

1. Click the **Details** button on the Impedances screen.

   The Impedance Measurement Details window displays.

2. Right-click the desired electrode and choose **Turn off/on electrode**.

   The electrode is turned off or turned on respectively.

   The Add note to electrode window appears.

3. Type an informational note about the electrode for example reasons for turning off/on electrode into the text box.

4. Click **Save and Close** to close the Add note to electrode window.

   Electrode notes can be viewed by placing the cursor over the electrode that has been turned off.

5. Click **OK** to close the Impedance Measurement Details window.

Result:

- The selected electrodes are now either turned on or turned off as required.

Note: Electrodes can also be turned on or off in the same manner from the Comfort screen.

AutoNRT

Use the AutoNRT screen to measure NRT® threshold levels. Neural Response Telemetry (NRT) records neural activity within the cochlea in response to electric stimulation from the implant, and NRT threshold measurements can be used to create a MAP.

When you start AutoNRT, both sides are taken off air, and returned on air afterward.

Click the  to:

- Specify the **Number of Electrodes** (3, 5, 9, or All) if this is different from the default.

  Note: By default, Custom Sound Pro software sets the number of electrodes to 5 (where available) and selects an even distribution along the array. You can change the default number in the **AutoNRT** tab of the Clinician Details and Preferences window, or click the Channel Numbers in the Channel Grid to select or de-select individual channels for measurement.

- Set the starting current level (CL) to be used in the measurement.
- Display the AutoNRT traces window showing stimulation responses as the measurement process takes place.

  The NRT Traces window displays in front of the AutoNRT screen.

The changes you make in  apply for the current session only. Use the **NRT** tab of the Clinician Details and Preferences window to set persistent default values for AutoNRT parameters such as the number of electrodes to be measured, whether or not the NRT traces window appears, and Intraoperative and Postoperative options.

Click the **Details** button to open the NRT Levels window. Here you can select past NRT measurements to view. These measurements are only shown in the NRT Levels window for reference and do not affect the current MAP appearance or function.

Notes:

- An impedance test must be performed prior to obtaining NRT measurements. Any electrodes identified as faulty by this test are not measured.
- The AutoNRT function is not available for ABI541, Nucleus 24 or Nucleus 22 implant types.

Task steps:

1. Select the AutoNRT screen.
2. Click **Start**.

   Starting at the specified current level, the NRT level gradually increases by the default step size until the threshold is detected for each selected channel in turn. The defaults for both current level and step size are set in the Clinician Details and Preferences window.

   Note: To stop AutoNRT at any time, click **Stop** or the **Esc** key. Click **Continue** when you are ready to continue, or click **Skip Electrode** to skip the currently selected electrode and measure the next one.

   An information message displays when the measurements are complete.
3. To measure additional electrodes, select a larger value in the Number of Electrodes box in the  or select more Channel Numbers in the Channel grid, and then repeat the measurement process.

Result:

- The measured NRT values are saved and available for use when programming MAPs.

Notes:

- (Intraoperative mode only) By default, each electrode is conditioned at 230 current levels prior to measuring the NRT level.
- (Intraoperative mode only) Enhanced interpolation can be selected as a clinician preference, enabling automatic interpolation of NRT levels when the distance between two measured electrodes is less than 8 channels. Measurements are obtained 6 CL above and below the interpolated thresholds. If a neural response is detected above the threshold and none is detected below, the interpolated value is selected. If no response is detected above the threshold or one is detected below, standard AutoNRT is performed.

NRT Traces

Use the NRT traces screen to view the results of NRT measurements to determine if the NRT measured is a true response. If there is a negative and positive peak it is a true response.

Note: You can set the NRT Traces window to display automatically when performing AutoNRT by selecting **Show traces during AutoNRT** in the **AutoNRT** tab of the Clinician Details and Preferences screen.

Export data from an intraoperative remote assistant

You can export AutoNRT and impedance data from an intraoperative remote assistant to a .crf file for future importation to a patient record.

Task steps:

1. Connect the intraoperative remote assistant.
2. Right-click on the remote assistant icon in the status bar.
3. Select **Export AutoNRT and Impedance measurements**.

   The **Export Remote Assistant AutoNRT and impedance measurements to** window displays to allow you to select the file location.
4. Navigate to the location you wish to save the .crf file.
5. Click **Save**.

Result:

- The .crf file is saved to the selected location.

Import patient data into Custom Sound Pro software

You can import patient data into Custom Sound Pro software that has previously been exported from an intraoperative diagnostic device.

Task steps:

1. Click the **File** menu and select **Import Intraoperative Data**.
2. Select where to import the data from.

   The **Import Intraoperative Data** window displays with the following options:

   - **Browse cloud data** - can be selected if no patient session is currently open and allows the import of intraoperative data linked to the current clinic set in Custom Sound Pro software from the Cochlear Cloud.
   - **Import from local file** - can be selected if no patient session is currently open and allows the import of intraoperative data from a local file.
   - **Check cloud data via implant ID** - can be selected if a patient session with a known implant ID is open. It allows the import of intraoperative data for the current patient from the Cochlear Cloud.

     Note: For **Check cloud data via implant ID**, the interoperative data of the patient does not need to be linked to the current clinic set in Custom Sound Pro software.

   Note: For **Browse cloud data** and **Check cloud data via implant ID** you will need to login to myCochlear Professional with your email and password. If you do not have a myCochlear Professional login, contact your Cochlear representative.
3. Navigate to the data or local .crf file you want to import.
4. Click **Open**.
5. For local files, enter the password for the file if prompted.

   Note: Some files will be password protected on export.

   The data is imported into Custom Sound Pro software.

Result:

For intraoperative data that does not contain additional patient information:

- After the data import process has completed, displays the results depending on the success of the import:
    - If no new valid data has been saved to the database, Custom Sound Pro software displays a message to indicate no changes have been made, or
    - If the data has been saved to a database, Custom Sound Pro software displays a message to indicate that surgical measurements were saved to the database.
- When a .crf file is imported into Custom Sound Pro software, the intraoperative data is saved to the database. However, the intraoperative data is not associated with a patient at this stage.
- When the coil is placed on the patient's head, Custom Sound Pro software checks for unassociated intraoperative data that matches the patient's Implant ID. If one or more matches are found, a message displays to select the appropriate intraoperative data record for the patient. The message is colour coded to differentiate between records for right (red) and left (blue) ear implants. Intraoperative data records older than 4 months are ignored.

For intraoperative data that contains additional patient information (.crf3):

- After the file import process has completed, the Import Intraoperative Data window will be shown with the options:
    - **Create new patient -** a new patient record will be created in the database based on the intraoperative data.

      If a patient exists with the same implant ID, then a message will display confirming that a new patient record should be created.
    - **Associate data -** Custom Sound Pro software will attempt to match the patient information from the intraoperative data with existing patient records in the database. The Import Intraoperative Data window will display a list of any potential matches for selection. If no matches are found, or are not correct, the patient list can be used to select from existing patient records.

      To associate the intraoperative data with an existing patient record:

        1. Select a patient record from the potential matches or from the patient list.
        2. Click **Associate data**.

      The intraoperative data will now be associated with the selected patient.
    - **Cancel -** the intraoperative record is not saved to the database and the Import Intraoperative Data window will close.

Adjust

Use the Adjust screen to create and open MAPs, and make adjustments to Master Volume, bass, treble, comfort and thresholds that are suitable for your patient.

Select MAP

The MAP screen allows you to create a new MAP or open an existing MAP. Where changes are made to an existing MAP, a new MAP is automatically created allowing the original MAP to be preserved.

Create or open a MAP

The MAP screen allows you to create a new MAP or open an existing MAP. Where changes are made to an existing MAP, a new MAP is automatically created allowing the original MAP to be preserved.

To create a new MAP:

Task steps:

1. Select the sound processor and the desired MAP parameters from the drop-down lists in the Create a New MAP area.

   It is recommended the default parameters are used during an initial activation.

   Note: For CP1110 - Nucleus 8, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 and CP900 Series Sound Processors, the **Hybrid Mode** check box is available on the **Open or Create MAP** screen if an audiogram has been created for the patient. Refer to Program an acoustic component for further information on acoustic programming.

2. **CP1110 - Nucleus 8, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors:** For Hybrid MAPs, select the receiver type from the drop-down list.

   Based on the patient's audiogram, the most suitable receiver type is highlighted in the list. If you do not select a receiver type, you cannot proceed.

   Note: Ensure the correct receiver type is selected so that the appropriate gain and MPO can be applied.

3. Point to the **Create** button to display the **Create New MAP Based On** menu and click one of the available options:
    - **Latest AutoNRT** creates a MAP based on most recent valid NRT values.

      This option is only available when NRT has been run and there are more than 3 measures. It is not available for ABI541, Nucleus 24 ABI and Nucleus 22 implants.
    - **Population mean** creates a MAP based on population mean values.

      Not available for ABI541, Nucleus 24 ABI and Nucleus 22 implants.
    - **Other measures** displays the Select NRT/Objective levels screen.

      This is available when there are measurements (NRT, AutoNRT, EABR, etc.) but not available for ABI541, Nucleus 24 ABI and Nucleus 22 implants.
    - **Thresholds** creates a MAP with C levels set at 90 CL and T levels set at 80 CL on the Thresholds screen.

Result:

- The MAP is created using the specified parameters.

  Each MAP is assigned a number, incremented by one for each successive MAP.

Note: When you create a new ABI541 or Nucleus 24 ABI MAP, a message displays indicating that the electrode number ordering is reversed the new MAP. Refer to the channel numbering in the lower portion of the screen. Channel 1 is the highest frequency and Channel 22 is the lowest frequency.

To open an existing MAP, double-click the MAP in the MAP list.

To open multiple MAPs:

1. Select a MAP, press the **Ctrl** key and select other MAPs.
2. Right-click the selected MAPS and select **Open**.

To open a MAP from the sound processor, right-click on the **Program** in the status bar and select **Open MAP**.

Note: The patient must be off air for the **Open MAP** option to be available.

The selected MAP or MAPs then generally open in the Global Adjustments screen.

To save a MAP at any time, click the **Save MAP** button on the Set Levels toolbar, or click the **MAP** menu and select **Save** or **Save All**.

To close a MAP, click the **Close MAP** button on the Set Levels toolbar, or click the **MAP** menu and select **Close** or **Close All**.

Upgrade or convert a MAP

An existing MAP can be upgraded or converted for use with a different sound processor type. Custom Sound Pro software provides the following options:

- **Upgrade MAP:** the frequency table and as many parameters as possible are set to the defaults of the new sound processor.
- **Convert MAP:** where possible, the frequency table of the original MAP is copied to the new MAP. If the frequency table cannot be copied, Custom Sound Pro software adjusts the frequency boundaries or uses the default table for the new sound processor.

Note:

- To convert or upgrade existing Spectra or ESPrit Series Sound Processor MAPs to CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 or CP900 Series Sound Processors, you must first convert or upgrade the MAP to Freedom Sound Processors and then convert the generated Freedom Sound Processor MAP to CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 or CP900 Series Sound Processors. The same is also true for patients with Nucleus 22 implant types when upgrading to CP900 Series Sound Processors.
- MAP conversions are available from Freedom Sound Processors onwards (including Freedom Hybrid). MAP upgrades are not available from Freedom Sound Processors onwards (including Freedom Hybrid).
- The MAP Summary window is only available for Nucleus 24 and Nucleus 22 implant types.

Task steps:

1. Select the MAP you want to upgrade or convert.
2. Click the MAP menu and select Upgrade MAP or Convert MAP.

   A list of sound processor upgrade or conversion combinations appears.
3. Select the appropriate sound processor combination.

   The values of the original MAP are copied to a new MAP. Parameter values that are invalid for the new MAP are set to the default values for the new sound processor type.

   For CP900 Series Sound Processors and later when you click 'convert' a message is displayed asking if you want to copy settings.

   - If you choose 'Use Default' then the MAP will be converted, but global defaults for programs/ processor settings will be set for the selected processor type.
   - If you choose 'Copy previous' then it will copy across the existing programs and processor settings where possible (with previous settings coming from processor or database).

   For any settings that were not available on the old processor will be set to default settings.
4. For Nucleus 24 and Nucleus 22 implant types only, details of the changes display in the MAP Summary window.

   - To print a report of the changes, click Print Summary and use the Print toolbar on the Report viewer.
   - To add details of the changes to the MAP notes, select Add Summary to the MAP Notes of the New MAP, and click OK.
   - MAP notes are saved with the MAP and added to MAP reports.

   Click the Close button to close the MAP Summary window.

Result:

- The new MAP displays in the **Select or Create a MAP** list in the Select Map tab of the Adjust tab.

Compare MAPs

The MAP Compare function allows you to compare up to four different MAPs, including those created for different sound processors and different implants.

To compare MAPs created for the same implant:

Task steps:

1. Press the **Ctrl** key and select the MAPs you want to compare in the MAP list.
2. Right-click the selected MAPs and select **Compare MAPs**.

   The MAP Comparison window displays the differences between the MAPs, including the T and C levels, pulse width, gains and frequency boundaries for each channel.
3. To test a MAP using live voice testing, select the sound processor from the **Processor** drop-down list and click the **Go Live** button  corresponding to the desired MAP. Click the **Stop** button  to stop live voice testing.
4. To print the MAP comparison details, click **Print**. Type any notes to be added to the report in the MAP Comparison Report window, and click **Report**.

Result:

- The MAP comparison details display in the Report viewer, and can be printed using the Print toolbar.

To compare MAPs created for bilateral implants:

Task steps:

1. Select one of the MAPs you wish to compare in the MAP list.
2. Right-click the MAP and select **Compare with Another MAP**.

   The Select MAPs window displays a list of available MAPs for each implant.
3. Select the check boxes of the required MAPs and click **Compare**.

Result:

- The MAP Comparison window displays the differences between the MAPs.

Note: Custom Sound Pro software also allows you to compare programs from previous sessions. See View session history.

Manage MAPs

Use the Manage MAPs screen to archive MAPs which are no longer to be used, and to restore previously archived MAPs so they can be used again.

Archive a MAP

MAPs that are no longer required can be archived from the MAP list. MAPs that have been archived can be restored and used again.

Task steps:

1. Click on **MAP > Manage** in the Menu bar.

   The Manage MAPs window displays.
2. Select the MAP you want to archive in the Active list.
3. Click **Archive**.

   The MAP moves from the Active list to the Archived list, and is no longer visible in the MAP screen.
4. Click the **Close** button  to close the Manage MAPs window.

Result:

- The MAP is archived and can no longer be accessed in Custom Sound Pro software other than to be restored.

Restore a MAP

MAPs that have been archived can be restored and used again.

Task steps:

1. Click on **MAP > Manage** in the Menu bar.

   The Manage MAPs window displays.
2. Select the MAP you want to restore in the Archived list.
3. Click **Restore**.

   The MAP moves from the Archived list to the Active list, and is restored to the MAP screen.
4. Click the **Close** button  to close the Manage MAPs window.

Result:

- The previously archived MAP is now available for use.

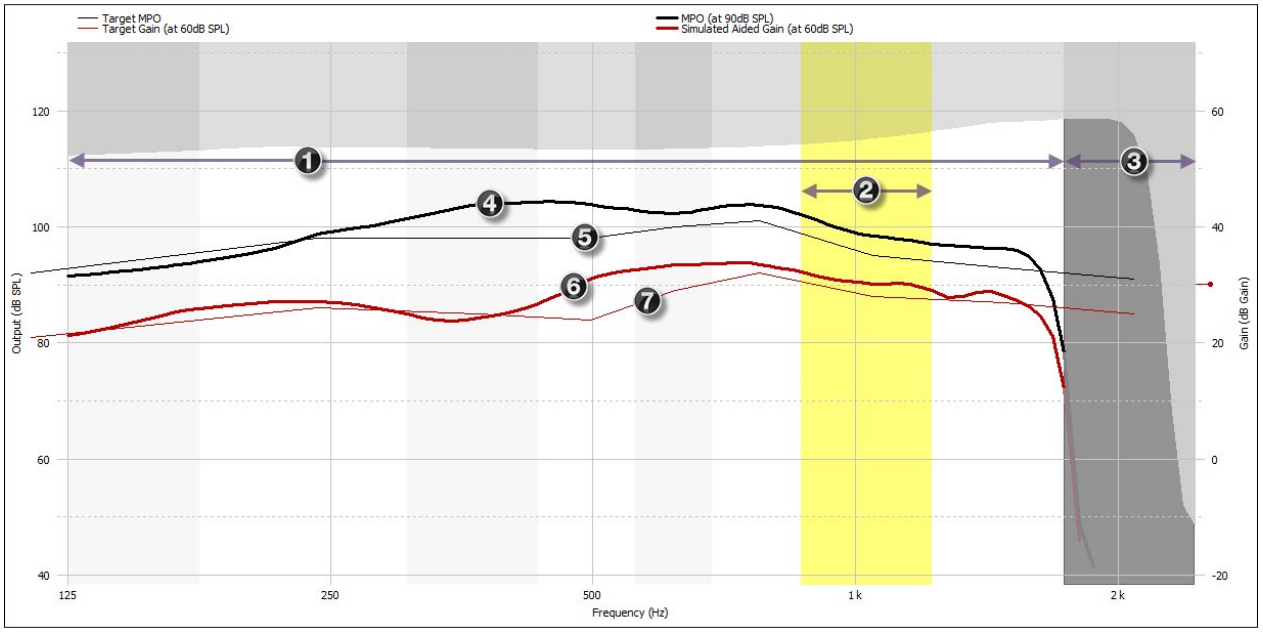
Acoustic

Use the Acoustic screen to configure the acoustic parameters for a Freedom Hybrid, a CP900 Series, CP1000 - Nucleus 7, CP1001 - Nucleus 7 SE, CP1002 - Nucleus 7 S or CP1110 - Nucleus 8 Sound Processor based on the patient's pure tone audiometric data. Gain and maximum power output (MPO) can be programmed for the low frequency range of hearing.

You can balance loudness using electrical stimulation alone, or with electrical and acoustic stimulation combined.

Notes:

- The Acoustic screen is available only when a Hybrid MAP is selected.
- Acoustic channels can be enabled or disabled if required. Audiometric points within a disabled band are not used for prescription.



Key:

1. Enabled channels.
2. Selected channel.
3. Disabled channel.
4. MPO: Maximum Power Output.
5. Target MPO.
6. Simulated Aided Gain (at 60dB SPL): the difference between the level of sound into the hearing aid and the output.
7. Target Gain (at 60dB SPL).

Set acoustic parameters

Custom Sound Pro software allows you to set the acoustic parameters for a Freedom Hybrid, a CP900 Series, CP1000 - Nucleus 7, CP1001 - Nucleus 7 SE, CP1002 - Nucleus 7 S or CP1110 - Nucleus 8 Sound Processor based on the patient's pure tone audiometric data. Gain and maximum power output (MPO) can be programmed for the low frequency range of hearing.

Task steps:

1. Click the **Acoustic** tab in the **Adjust** screen, or click the **Acoustic** button  on the Set Levels toolbar.

   The Acoustic screen displays.

2. If the patient does not have an audiogram, or their audiogram needs to be updated, click **View Audiogram**.

   The Audiogram tab of the Patient Details window displays in Add / Edit mode.

   a. Click **AC**  to select air conduction thresholds.

   b. Click the audiogram to enter the thresholds.

      Use the right-click menu to mark a point as no response. A no response entry does not contribute to the prescription.

   c. Click **Save** to save the audiogram entries and close the Patient Details window.

   d. Select a **Receiver Type** in the Set Prescription panel. The most suitable type is identified in the list with a  symbol.

    **Note:** A recent postoperative audiogram is required. If an existing audiogram has not been reviewed in the past twelve months, a new audiogram should be entered.

3. Select **Show 2CC Values** or **Show Real Ear Values** from the drop-down list.

   The Frequency Graph displays four curves: Target MPO and Aided MPO (OSPL 90), and Target Gain and Simulated Aided Gain (60 dB SPL input). The lower frequency boundary for electric stimulation is automatically set based on the patient's audiogram.

4. Select a prescription method (**DSL** or **NAL**) from the **Method** drop-down list in the Set Prescription panel, and click the **WDRC** or **Linear** option button.

   NAL and WDRC are selected by default.

5. **CP1110 - Nucleus 8, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors**: Select the receiver type if it has not already been set.

   If multiple MAPs are being written to the sound processor, make sure the receiver type is the same for all MAPs.

   Note: If the receiver type is not set, the prescription cannot be calculated and you cannot go On Air.

6. Select mould type:

   CP1110 - Nucleus 8, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors: Custom, Power Dome, Bass Single Dome, Bass Double Dome, or Open Dome.

   The most suitable mould type is highlighted in the list with a symbol.

   If multiple MAPs are being written to the sound processor, make sure the mould type is the same for all MAPs.

   CP900 Series Sound Processors: Custom, Power Dome, or Plus Dome.

   If Custom ear mould is selected, also select a vent size (0, 1, 1.4, 2.4, or 3 mm) in **Vent Size**.

   Freedom Hybrid Series Sound Processors: Select the vent size (0, 1, 1.4, 2.4, or 3 mm) in the **Vent Size** field.

   Custom Sound Pro software automatically recalculates the gain and MPO levels.

7. Click the **MPO** or **Gain** option button based on the amplification characteristics you wish to set.
8. Select the step size (1 or 3).

   The step size units for MPO are dB SPL and for Gain are dB.

9. Ensure the sound processor is **Off Air**.
10. Clear the **Mute Acoustic** check box.

    Note: You can only set or clear the **Mute Acoustic** check box when the sound processor is **Off Air**.

11. Set the sound processor to  **On Air**.
12. Select the frequency bands to be modified. Selected bands are highlighted on the graph in yellow:
    - Click on a band to select that band and deselect all others.
    - Double-click on the graph to select all non-disabled bands.
    - Click and drag to select multiple bands.
    - Right-click on a band to display the enable / disable popup menu. Click on the menu option to enable or disable that band.

      Notes:

      - Disabled bands are shown in grey.
      - Only the last active band at either end of the active range can be disabled.
      - A disabled band can only be enabled if it is adjacent to an active band.
13. Use the left **Increase** and **Decrease** buttons to adjust the level on the selected channels.

    Tip: To reverse your channel level adjustments, **Set Prescription** modifications, and **Frequency Boundary** changes, click **Undo** in the MAP menu. Restore them by clicking **Redo**.
14. Set the sound processor to  **Off Air** to stop live voice testing.

Result:

- The acoustic parameters for the Sound Processor are set.

To balance loudness for CP1110 - Nucleus 8, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 and CP900 Series Sound Processors:

1. Go live using acoustic stimulation only:
    a. Remove the coil from the patient's implant.
    b. Ensure the sound processor is  **Off Air**.
    c. Clear the **Mute Acoustic** check box.
    d. Set the **Acoustic** indicator to  **On Air**.
2. Obtain a loudness rating of 'comfortable but slightly soft' by adjusting the overall gain only.
3. Return the coil to the patient's implant.
4. Go live using electric stimulation only:
    a. Set the **Acoustic** indicator to  **Off Air**.
    b. Set the **Mute Acoustic** check box.
    c. Set the **Acoustic** indicator to  **On Air**.
5. Obtain a loudness rating of 'comfortable but slightly soft'.
6. Go live using both electric and acoustic stimulation:
    a. Set the **Acoustic** indicator to  **Off Air**.
    b. Clear the **Mute Acoustic** check box.
    c. Set the **Acoustic** indicator to  **On Air**.
7. Confirm an overall loudness rating of comfortable.

Note:

- Additional acoustic channels can be added if required by right-clicking on the lowest deactivated channel (i.e. in the shaded grey area) and selecting **Enable Channel**.

Global Adjustments

Use the Global Adjustments screen with live speech to set the master volume until sounds are comfortably loud for the patient, and then to set bass and treble levels to adjust the sound quality they hear. Adjustments to the master volume are always required after creating an initial hearing profile.

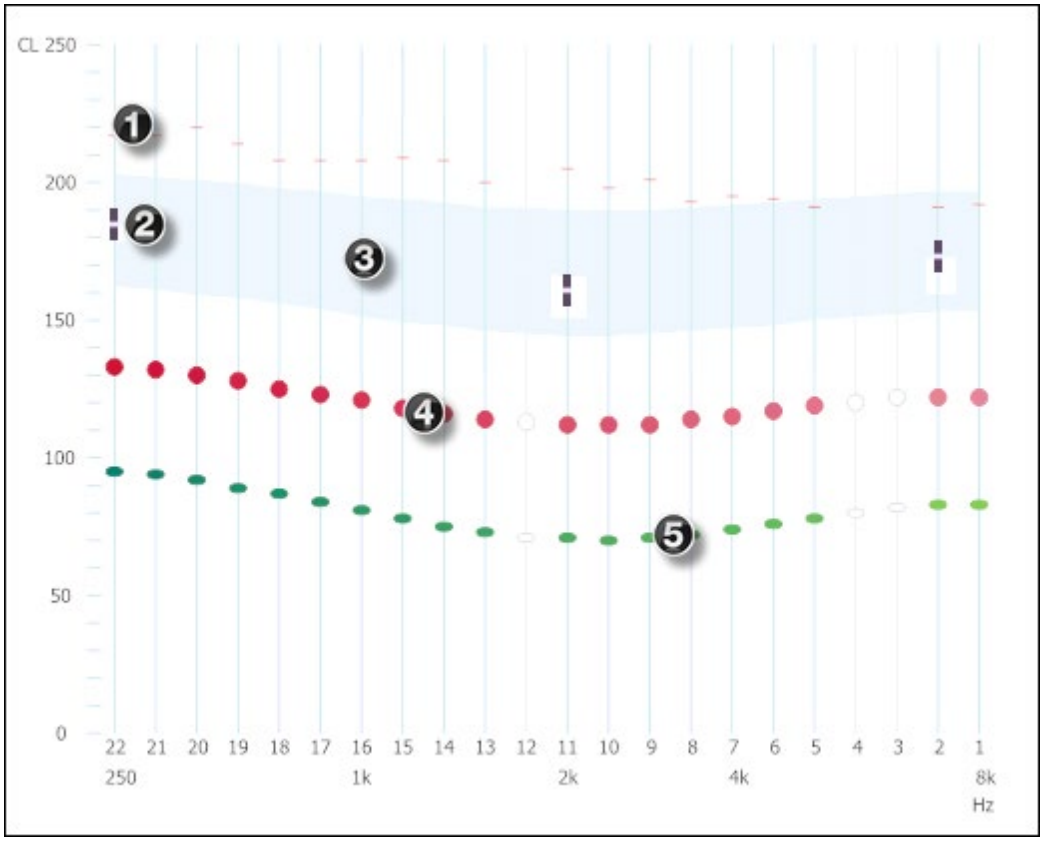
You can use the Global Adjustments screen to balance the loudness of bilateral MAPs simultaneously as the two MAPs display side by side. Adjust each side individually to ensure the same perceived volume and sound quality, then link the two sides and set overall loudness to achieve a comfortably loud sound level.

Click the  to:

- Switch on the stimulation heard by the patient.
- Set the **On air volume** of the beeps that stimulate the cochlear implant using the R and L drop-down lists.
- Specify whether Master Volume, Bass, and Treble adjustments apply to both C and T levels (T & C), C levels only (C), or T levels only (T).
- Specify whether changes are made in step size or by a percentage of the dynamic range.
- Set the NRT profile displayed as view only from the Select NRT levels screen using the R **NRTs**, or L **NRTs** button.
- View a subset of the MAP parameters, or click R **Open**, or L **Open** to display the Parameters window to view and modify a larger set of MAP parameters.

Click off the  to close.

Unilateral display:

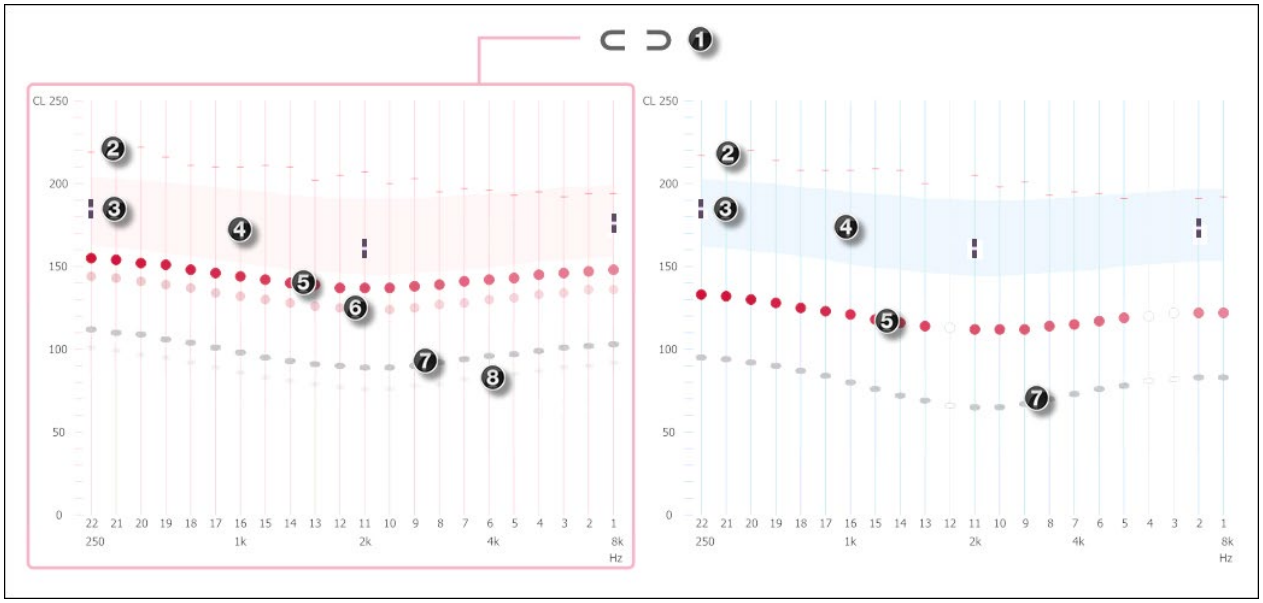


Key:

1. Compliance limits for each electrode (if set in the Clinical Details and Preferences screen).
2. NRT values (if set in the Clinical Details and Preferences screen Adjust tab).

   Note: only NRT values greater than zero (those for which AutoNRT is measured) are shown.
3. The expected range of C levels, based on either the patient's AutoNRT results or the population average, which can assist you in setting the Master Volume. Some patients will need to have their C level set above or below this range.
4. The current C levels of the electrodes, shown as red markers when adjustable and grey markers when not currently adjustable in this screen.
5. The current T levels of the electrodes, shown as green markers when adjustable and grey markers when not currently adjustable in this screen.

Bilateral display:



Key:

1. The **Link** icon. Visible only when programming a bilateral patient.
2. Compliance limits for each electrode (if set in the Clinical details and preferences screen).
3. NRT values (if set in the Clinical Details and Preferences screen Adjust tab).

   Note: only NRT values greater than zero (those for which AutoNRT is measured) are shown.
4. The expected range of C levels, based on either the patient's AutoNRT results or the population average, which can assist you in setting the Master Volume. Some patients will need to have their C level set above or below this range.
5. The current C levels of the electrodes, shown as red markers when adjustable, and grey markers when not currently adjustable in this screen.
6. The previous C levels of the electrodes.
7. The current T levels of the electrodes, shown as green markers when adjustable, and grey markers when not currently adjustable in this screen.
8. The previous T levels of the electrodes.

Adjust Master Volume

Adjust Master Volume to control the overall loudness of all sounds heard by your patient and ensure that the patient perceives all sounds at the same comfortably loud level.

Task steps:

1. Open the Global Adjustments screen.

   Note: If the patient was on air before navigating to the Global Adjustments screen, they remain on air. If the patient was off air, they remain off air.

2. If the patient is fitted with two cochlear implants:
   - To adjust levels for both MAPs at the same time and by the same amount, ensure the **Link** is closed: .
   - To adjust levels for one MAP at a time, ensure the **Link** is open: and select either Right or Left to specify the MAP to be adjusted.
3. Click **Master Volume**.
4. Use the Up and Down buttons to increase or decrease the loudness.

   To change the size of adjustments, click in the **Step size** box below the buttons and either type a new value or use the keyboard ↓ or ↑ arrow keys to increase or decrease the value.

   Note: For CI500 Series, CI422, Nucleus Hybrid, Freedom (CI24RE) and Nucleus 24 implants, if you exceed the compliance levels on one or more channels, a message displays to indicate that there are channels out of compliance. To bring the MAP into compliance, click Continue. The pulse width is changed across all electrodes and the T and C levels are reduced. Use the Global Adjustments screen to adjust levels to achieve a comfortable loudness level for the patient.

   Tip: To reverse your Master Volume adjustments, type **Ctrl** + **Z** or click **Undo** in the MAP menu. Restore them by typing **Ctrl** + **Y** or clicking **Redo**.

Result:

- The master volume is adjusted.

Adjust Bass and Treble

Adjust bass to increase or decrease the volume of low pitched or deep sounds. Adjust treble to increase or decrease the volume of high pitched sounds.

Task steps:

1. Open the Global Adjustments screen.

   Note: If the patient was on air before navigating to the Global Adjustments screen, they remain on air. If the patient was off air, they remain off air.

2. If the patient is fitted with two cochlear implants:
   - To adjust levels for both MAPs at the same time and by the same amount, ensure the **Link** is closed: .
   - To adjust levels for one MAP at a time, ensure the **Link** is open: and select either Right or Left to specify the MAP to be adjusted.
3. Click **Bass** or **Treble**.
4. Use the Up and Down buttons to increase or decrease the level.

   Your changes are saved when you select **Save** in the Finalise screen.

   To change the size of adjustments, click in the **Step size** box below the buttons and either type a new value or use the keyboard ↓ or ↑ arrow keys to increase or decrease the value.

   Note: For CI500 Series, CI422, Nucleus Hybrid, Freedom (CI24RE) and Nucleus 24 implants, if you exceed the compliance levels on one or more channels, a message displays to indicate that there are channels out of compliance. To bring the MAP into compliance, click Continue. The pulse width is changed across all electrodes and the T and C levels are reduced. Use the Global Adjustments screen to adjust levels to achieve a comfortable loudness level for the patient.

   Tip: To reverse your bass and treble adjustments, type **Ctrl** + **Z** or click **Undo** in the MAP menu. Restore them by typing **Ctrl** + **Y** or clicking **Redo**.

Result:

- The Bass and/or Treble settings are adjusted.

Adjust MAP parameters

MAP parameters are applied when a MAP is created. You can adjust them when required.

Task steps:

1. Click **Open** or **Open** in the on the Global Adjustments, Comfort, or Thresholds screen.

   Or, click the **MAP Parameters** button on the Set Levels toolbar.

   The Parameters window displays.

2. Adjust the desired boxes.

   Note: You will need to take your patient off air to adjust some of the parameter settings.

   Note: If you make a change to a parameter that automatically alters the value of another parameter, a notification will appear.
   For example: "The following parameters are altered by changing Pulse Width (µs) • Maxima".

3. Click **Close** to save the changes and close the Parameters window.

Result:

- The MAP parameters are adjusted.

The following parameters are available in the Parameters window based on the type of sound processor:

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series, CP800 Series, Freedom Hybrid and Freedom sound processors

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series, CP800 Series, Freedom Hybrid and Freedom sound processors	
Strategy:	The sound coding strategy defines how the sound processor will analyse acoustic signals and code them for delivery to the implant.
Stimulation Mode:	The stimulation mode determines the location of the indifferent electrode relative to the active electrode, and is applied here at MAP level. The stimulation mode / indifferent electrode and the active electrode can be modified on a per channel basis using the Data Grid on the Set Levels screen.
Channel Rate:	The channel rate (or stimulation rate) determines the frequency in Hertz (Hz) of the biphasic current pulse delivered to a channel. The channel rate applies to all channels in a MAP.
Maxima:	The maxima is a parameter of the SPEAK, ACE™ and MP3000™ sound coding strategies, and refers to the frequency ranges in an audio signal that contain the greatest amounts of energy. The value specifies the number of maxima that will be selected for any given signal.
Pulse Width (µs):	The value specifies the duration of the pulse in microseconds, and is applied here at MAP level. For CI500 Series, CI422, Nucleus Hybrid, Freedom (CI24RE) and Nucleus 24 implants, when you increase the pulse width, the dynamic range is maintained but the T and C levels are reduced. Shift levels using the **T & C** option to adjust levels to achieve a comfortable loudness level for the patient. When you decrease the pulse width, the dynamic range and T and C levels are maintained.

Power Level Setting:	Custom Sound Pro software allows an automatic or manual power setting to be applied to a MAP. It is recommended Auto Power is used wherever possible, enabling the power level for the sound processor to be automatically optimised.
Tone Level (%DR)	Specifies the loudness of tones as a percentage of the dynamic range.
Tone Channel	Specifies the channel used for tones to indicate successful key press actions (for example, when changing volume levels).
Low Tone Channel	Specifies the channel used for tones to indicate unsuccessful key press actions or warnings (for example, low battery warnings).
Amplitude Scale	The amplitude scale defines the amount of charge delivered for each stimulation, and the type (current level, stimulus level) can be selected for Nucleus 22 implants only.

Select NRT levels

NRT measurements obtained via Custom Sound Pro software can be used as a guide for setting T and C levels. NRT measurements must be selected in order for them to be displayed on the Adjust screens.

Task steps:

1. Click R **NRTs**, or L **NRTs** button from under the ⚙.

   The Select NRT Levels window displays.
2. Select the type pulse width from the drop-down list.
3. Select the measurements you want to use.

   Multiple measurements can be selected by holding down the **Ctrl** key and clicking the required measurements.
4. Click **OK**.

Result:

- The NRT levels markers for the measured channels are display on the Adjust screens.

Comfort

Use the Comfort screen to check that all sounds are comfortably loud for the patient. The objective is to alleviate any discomfort the patient might report with certain loud sounds.

Comfort is checked by playing eight different sounds evenly spaced in bands across the implant. To check that all eight bands are comfortably loud, a sweep across all bands plays a scale of beeps to the patient. If the patient indicates a band is too loud, you can adjust the loudness for that particular band.

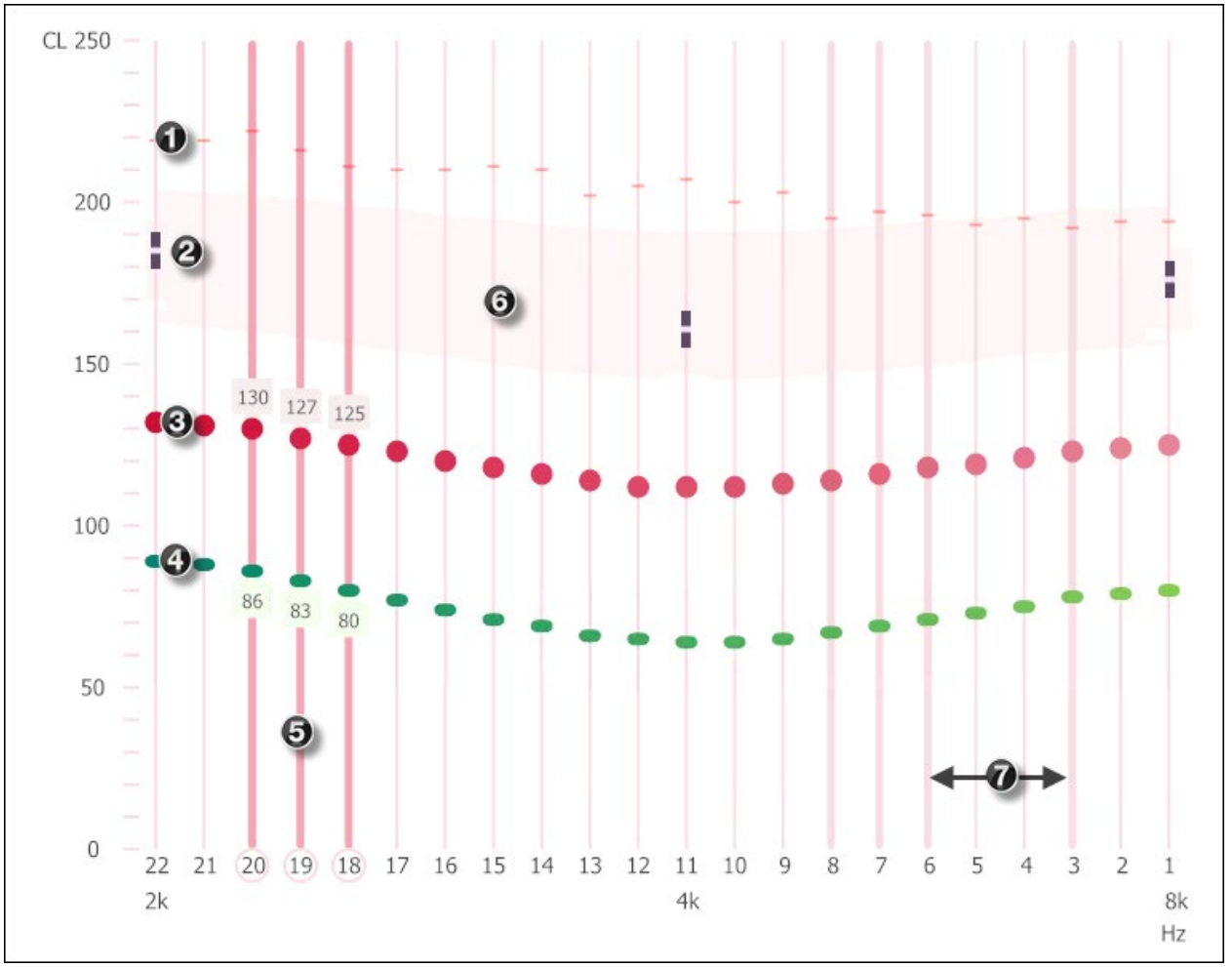
Note: For most sound processors, each band swept in the Comfort screen stimulates three adjacent electrodes simultaneously. Freedom sound processors only sweep a single channel, stimulating only one electrode of each band. Three channel beeps may sound louder than a single channel sweep.

While in the Comfort screen you can:

- Save the current MAP by clicking the **Save** option in the MAP menu.
- Specify the current MAP's title and add explanatory text by clicking the **MAP title and notes** option in the MAP menu to bring up the Title and Notes window.
- Click the  to:
  - Switch on the stimulation heard by the patient.
  - Specify whether sweep is made at C level or at a percentage of the dynamic range.

    Note: Sweeps at a percentage of the dynamic range can only be performed on individual electrodes, not on bands.
  - Set the NRT profile displayed as view only from the Select NRT levels screen using the **NRTs**, or **NRTs** button.
  - View a subset of the MAP parameters, or click **Open** or **Open** to display the Parameters window to view and modify a larger set of MAP parameters.

  Click off the  to close.



Key:

1. Compliance limits for each electrode (if set in the Clinical details and preferences screen).
2. NRT values (if set in the Clinical Details and Preferences screen Adjust tab).

   Note: only NRT values greater than zero (those for which AutoNRT is measured) are shown.
3. Current C levels of the electrodes.
4. Current T levels of the electrodes, shown as green markers when adjustable and as grey markers when not currently adjustable in this screen.
5. Currently selected band.

   Selection displays an electrode's C level and T level values, as well as the electrode number.
6. Expected range of C levels, based on either the patient's AutoNRT results or the population average.
7. Electrodes where C levels have been adjusted since the MAP was last saved. Other electrode C levels are altered by this adjustment.

Task steps:

1. Open the Comfort screen.

   Note: If the patient was on air before navigating to the Global Adjustments screen, they remain on air. If the patient was off air, they remain off air.

2. If the patient is fitted with two cochlear implants, then click either **Right** or **Left** to specify the implant for comfort adjustment.

3. Click a **Band** and then click **Sweep >** or **< Sweep** to start a sweep to check for appropriate loudness in all bands.

   - To stop the sweep at any point, click **Pause** or the **Esc** key.
   - To continue the sweep after pausing, click **Resume**.
   - To restart the sweep after clicking **Esc**, click **Sweep >** or **< Sweep**.

   The patient should hear a 'beep' sound for each band in succession.

   If the patient does not report any sounds that are either uncomfortably loud or too quiet, and there are no signs of non-auditory stimulation, e.g. facial nerve stimulation, then no adjustments are required.

   Note: To sweep individual electrodes instead of bands of three, click an electrode and then click **Sweep >** or **< Sweep**. This is useful to ensure complete electrode coverage for Freedom processors which sweep only one electrode per band.

4. If the patient indicates sound is too loud or too soft, click the corresponding band button to stop the sweep.

5. Adjust the loudness for the band.

   Note: To adjust the C level for an individual electrode, click the electrode and use the arrow buttons to increase or decrease the C level.

   Note: To change the size of adjustments, click in the **Step size** box below the buttons and either type a new value or use the keyboard ↓ or ↑ arrow keys to increase or decrease the value.

   Tip: To reverse your C level adjustments, type **Ctrl** + **Z** or click **Undo** in the MAP menu. Restore them by typing **Ctrl** + **Y** or clicking **Redo**.

6. You can turn electrodes on and off from the comfort screen when the sound processor is  **Off Air**.

   To turn on or off an electrode:

   a. Right click on the electrode you want to turn on or off.
   b. Select **Turn on/off electrode**.
   c. Add a note to the electrode.
   d. Click **Save and Close**.

      Notes are visible when hovering over an off electrode.

7. Perform another sweep to check for a comfortably loud sound level across all bands, and repeat the process if necessary.

   Your changes are saved when you select **Save** in the Finalise screen.

Result:

- The C levels are adjusted.

Thresholds

Use the Thresholds screen to adjust the threshold measurements (T levels) for patients who have difficulty hearing the quietest sounds, or are hearing constant background noise. The threshold levels for five evenly distributed electrodes along the cochlear implant can be adjusted.

Adjust each level so that it is just audible to the patient and then go on air to check the adjustment.

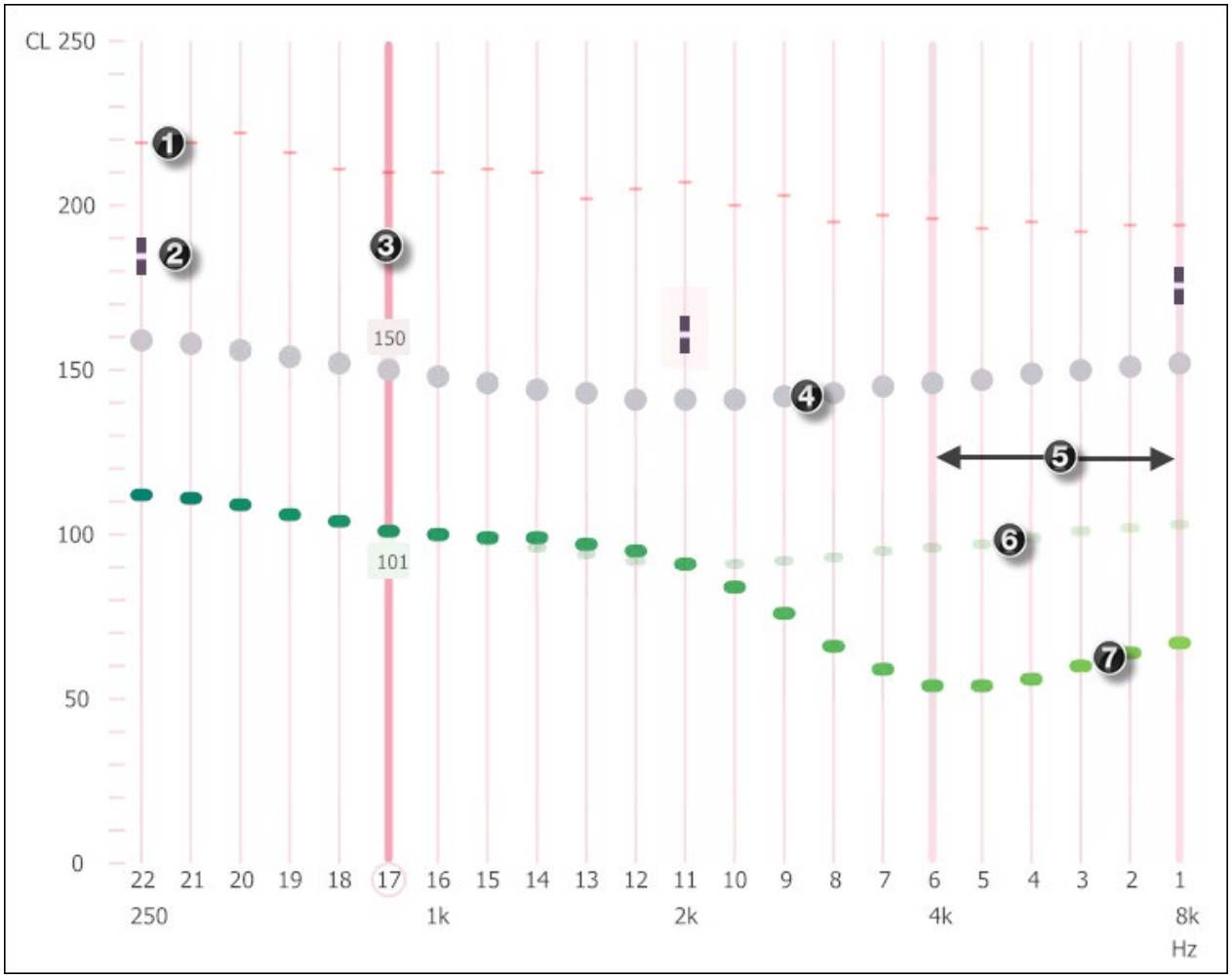
When you access the Thresholds screen, the patient is initially on air and is able to hear you provide instructions. However, when you click any of the buttons on the Thresholds screen, the patient immediately goes off air. Ensure you provide the patient with instructions before making any adjustments.

Threshold interpolation will only happen between measured channels.

Note: While in the Thresholds screen you can:

- Specify the size of the **Up step** or **Down step** adjustments.
- Save the current MAP by clicking the **Save** option in the MAP menu.
- Specify the current MAP's title and add explanatory text by clicking the **MAP title and notes** option in the MAP menu to bring up the Title and Notes window.
- Click the  to:
    - Specify the number of stimulations (1 to 6). Asking the patient for the number of beeps they hear enables you to compare their answer with the number of stimulations actually made.
    - Set the NRT profile displayed as view only from the Select NRT levels screen using the **NRTs**, or **NRTs** button.
    - View a subset of the MAP parameters, or click **Open** or **Open** to display the Parameters window to view and modify a larger set of MAP parameters.

  Click off the  to close.



Key:

1. Compliance limits for each electrode (if set in the Clinical details and preferences screen).
2. NRT values (if set in the Clinical Details and Preferences screen Adjust tab).

   Note: only NRT values greater than zero (those for which AutoNRT is measured) are shown.
3. Currently selected electrode.

   Selection displays an electrode's C level and T level values, as well as the electrode number.
4. Current C levels of the electrodes, shown in grey as they are not adjustable in the Thresholds screen.
5. Electrodes where T levels have been adjusted since the MAP was last saved. Other electrode T levels are altered by this adjustment.
6. Previous T levels of the electrodes.
7. Current T levels of the electrodes.

Note: If enabled, a small blue dot is shown above electrodes previously measured in a saved MAP or a new MAP based on the saved MAP. Hovering over the dot will display the date and the MAP number of the measured electrode.

Task steps:

1. Open the Thresholds screen.

   The patient is on air and able to hear your instructions.

2. If the patient is fitted with two cochlear implants, then click either **Right** or **Left** to specify the implant for threshold adjustment.

3. Change the number of beeps played if necessary, using **Number of Stimulations** in the .

4. Click on each of the five thresholds (**Very high**, **High**, **Mid**, **Low**, and **Very low**):

   a. Ensure the patient is off air, then you can drag the chosen threshold's T level to a clearly audible point so that the patient can get a reference sound.

   b. Use the arrow buttons to set the threshold to the minimum value where the patient can hear the beeps.

      - Click the right arrow to play 'beep' sounds to the patient at the current level.
      - If the patient cannot hear the sound, click the up arrow .

        The level increases and beeps are played to the patient at the new level.

        Note: To change the step size of the level increase, specify a new **Up step** value either by typing a value into the box, or by clicking in the box and using the keyboard up or down arrow keys to increase or decrease the value.

      - If the patient can easily hear the sound, click the down arrow to decrease the level.

        Note: To change the step size of the level decrease, specify a new **Down step** value either by typing a value into the box, or by clicking in the box and using the keyboard up or down arrow keys to increase or decrease the value.

   Tip: To reverse your T level adjustments, type **Ctrl** + **Z** or click **Undo** in the MAP menu. Restore them by typing **Ctrl** + **Y** or clicking **Redo**.

5. Click the **Off Air** button to go on air.

   The patient is on air and able to hear your instructions.

6. Check whether or not the level of soft sounds has improved for the patient, and repeat the process if necessary.

   Your changes are saved when you select **Save** in the Finalise screen.

Result:

- The thresholds are set to the minimum level at which the patient can still hear soft sounds.

Use Fitting Assistant

Fitting Assistant provides a knowledge base of commonly reported sound quality symptoms, together with recommended actions.

Task steps:

1. On any of the screens under Adjust, click the question mark icon to open the **Fitting Assistant**.
2. Type a symptom in the **Search** box, or select an option in the list of symptoms.

   The Select an Action box displays a list of suggested actions.

3. Select the desired action.

   The Details box indicates how the selected action changes the sound quality of the MAP and advises whether the change can be automatically applied by Custom Sound Pro software.

4. Click **Apply** (where enabled).

   Changes are made to the MAP as detailed, and a counter appears alongside the selected action indicating the number of times the action has been applied.

   Where Apply is not enabled, the suggested action can be performed manually.

5. To undo an action applied through Fitting Assistant, click the **Undo** button.

Result:

- The patient's MAP settings are modified as per the information provided by Fitting Assistant.

Advanced Troubleshooting

In some instances troubleshooting of the cochlear implant by use of the Advanced Telemetry Test may be required. Indicators for such troubleshooting include decreased performance or a failure to achieve the expected performance. Please contact your Cochlear representative if any of these indicators are present.

Set Levels

Use the Set Levels screen to set threshold (T) and comfort (C) levels for the currently selected MAP, and to adjust MAP parameters as required.

The Set Levels screen contains the following areas:

- **Set Levels toolbar:** allows various actions and parameters to be applied to the currently selected MAP.
- **Programming tab:** contains the controls used to set T and C levels and check battery suitability. The **Expand** and **Contract** arrows allow the various panels to be expanded or collapsed.
- **MAP Summary:** contains information about the current MAP. Show details for parent MAP number, strategy, mode, rate, maxima and pulse width.

  For CI500 Series, CI422, Nucleus Hybrid, Freedom (CI24RE) and Nucleus 24 implants, if you exceed the compliance levels on one or more channels, a message displays to indicate that there are channels out of compliance. To bring the MAP into compliance, click **Continue**. The pulse width is changed across all electrodes and the T and C levels are reduced. Shift levels using the **T & C** option to adjust levels to achieve a comfortable loudness level for the recipient. Alternatively, click **Ignore**. The message is not displayed again during the session and the channels remain out of compliance.
- **Channel Grid:** displays channels for each electrode along the array. Each active channel displays the following markers:
  - C level
  - T level
  - NRT/objective level

  The markers can be adjusted by clicking and dragging them to the desired current level.

  Channels corresponding to turned off electrodes are automatically disabled and indicated by a symbol. Electrode Notes can be viewed by placing the cursor over the symbol. The channels on which high and low frequency tones are presented are indicated by a **Bell** symbol.

  The currently selected channel displays in gold in the Channel Grid on the Set Levels screen. Multiple channels can be selected by clicking the Channel Numbers, which remain highlighted until the channels are de-selected. The right-click menu displays a list of actions that can be applied to the selected channel or channels.

A narrow bar indicates T and C levels are automatically interpolated for that channel. Interpolation is only available in Monopolar stimulation modes and between channels that have the same pulse width. To make an interpolated channel measurable use one of the following options:

- Click the **Make All Channels Measurable** button  on the Set Levels toolbar to access the entire array.
- Highlight specific Channel Numbers in the Channel Grid and click the **Make Only Selected Channels Measurable** button  on the Set Levels toolbar. The non-selected channels are interpolated.
- Double-click an interpolated channel in the Channel Grid to make it measurable (and vice-versa).

- **Data Grid:** displays the parameters and values that apply to individual channels. The C level, T level and dynamic range values display by default, and additional parameters can be viewed by right-clicking on the Data Grid and selecting from the list of options. Values can be typed directly in the Data Grid cells or selected from drop-down lists.
- **Message box:** displays information and warning messages relating to the current MAP.

Note: A message will be displayed if a MAP has one or more channels that exceed the limit for stimulation charge density. Some patients may need electrical stimulation levels above those known to be safe from the literature. The long term effects of such stimulation are unknown. Please call your Cochlear representative if you need further advice.

Configure live program settings

Custom Sound Pro software allows you to adjust the volume, sensitivity and environment settings that apply to live voice testing. By default, Custom Sound Pro software sets the volume and sensitivity levels and other parameters such as ADRO® based on the environment that was last written to the sound processor. If more than one program is written to the sound processor, the settings are selected as follows:

- For CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 and CP900 Series Sound Processors, the settings from the last used program are selected. If last used program can't be determined (coil-off condition etc) then the setting from the first used program are selected. If no previous program exists, the default program settings for the sound processor are used.
- For CP800 Series and Freedom Sound Processors, if more than one Everyday environment exists, the settings from the first program are selected. If no Everyday environment exists, the settings from the Noise, Focus or Music environment are selected in that order. Where no previous environments exist, the default Everyday settings are selected.

Task steps:

1. Click the **Configure Live Program Settings** button  on the Set Levels toolbar.

   The Live Program Settings window displays.
2. Drag the **Volume** slider to the desired value (0 to 9, or 1 to 10 for CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series and CP800 Series Sound Processors).

   Notes:

   - The C levels that you see in the 'Set Levels' screen (i.e. what is shown on the screen) are always the C levels for a maximum volume setting (10).
   - When going live, at a conversational level of sound, the stimulation defaults to volume level 6 (i.e. those C levels you see on the screen are not reached).
   - When writing MAPs, the volume also defaults to 6 (unless it is changed).

3. Drag the **Sensitivity** slider to the desired value (0 to 20).

   The sensitivity level determines the minimum input signal level required for stimulation. A higher sensitivity setting requires a lower sound processor level to cause stimulation (and vice-versa).

4. Enable or disable other live program parameters as appropriate.

5. Click the **Close** button  to close the Live Program Settings window.

   The selected settings apply when you go live. The volume and sensitivity levels and the program configuration can be adjusted for individual programs in the Finalise screen (see Finalise).

Result:

- The live voice testing configuration parameters are set.

Select NRT/objective levels

NRT or objective measurements obtained via Custom Sound Pro software, Nucleus SmartNav App or Custom Sound® EP software can be imported into the Adjustment and Set Levels screens and used as a guide for setting T and C levels. NRT/objective measurements must be selected in order to use an NRT/objective streamlined programming method.

Note: When changing the pulse width and then adjusting the T & C levels of a MAP created with previous NRT measurements, going live with the created MAP can result in the MAP sounding too loud, causing discomfort. It is important to include behavioural measures when using NRT markers.

Task steps:

1. Click **Select NRT/Objective Levels** or **Import NRT/Objective Levels** in the Method panel in Set Levels screens.

   Or,

   Click **Create** to create a new MAP and select **Other measures** option from the **Create MAP based on** menu in the Select MAP screen.

   The Select NRT/Objective Levels window displays.

2. Select the type of measurement (for example, NRT) from the **Measurement Type** drop-down list.

   A list of available measurements displays, detailing the date of measurement and the electrodes measured.

3. Select the measurements you want to use.

   Multiple measurements can be selected by holding down the **Ctrl** key and clicking the required measurements.

4. Click **OK**.

Result:

- The NRT/objective levels for the measured channels display in the Channel Grid.

Note:

- For Nucleus 24 implant types, a prompt displays when **Import NRT/Objective Levels** is selected. Click **From Custom Sound EP** to access the Select NRT/Objective Levels window; or, click **From AGF File** to open an externally saved .agf file from NRT 3.x.
- For Nucleus 22 implants, NRT levels cannot be measured. The Method panel provides the option to **Select Objective Levels** only.

Use the behavioural method

The behavioural method allows T and C levels to be set based on behavioural responses from the patient. T levels on the streamlined programming channels (by default, channels 22, 16, 11, 6, and 1 where available) are measured using psychophysics and C levels are measured simultaneously using live voice testing. Where streamlined programming is supported, the behavioural method is selected by default when a new MAP is created.

Task steps:

1. Select the step sizes (1 to 10 CL) and the number of stimulations (1 to 999) in the Streamlined Programming panel.
2. Click the **Increase** button in the Set Ts area.

   The T level on the first streamlined channel increases by the step size indicated, and automatic stimulation occurs based on the number of stimulations specified.
3. Continue to increase the T level until the threshold is reached.

   A smaller step size can be selected and the **Decrease** button used as the threshold is neared. To manually stimulate a channel at any time, click the **Stimulate** button.
4. Click each of the remaining streamlined channels in the Channel Grid in turn, and set the T level for each.

   The T levels for the non-measured channels are automatically interpolated.
5. Click the **Go Live** button.
6. Talk to the patient and click the **Increase** button in the Live Cs area.

   The C levels increase globally by the step size indicated.
7. Continue to adjust the C levels until ongoing conversational speech is comfortably loud.
8. Click the **Stop** button to stop live voice testing.

Result:

- T and C levels are set, based on behavioural responses from the patient.

Note:

- The default channels for streamlined programming can be changed in the **Streamlined** tab of the Preferences window (**F9**).
- The default parameters for setting T and C levels can be changed in the **General** tab of the Preferences window.

Use the NRT/objective offset method

The NRT/objective offset method offsets the T level profile from the objective measurement profile, and enables a single offset channel to be measured using psychophysics. C levels are measured using live voice testing.

Task steps:

1. Click **Change Programming Method** in the Method panel.

   The Select Programming Method window displays.

2. Click the **NRT/Objective Offset** option button, and click **OK**.

   If NRT/objective levels have not been selected, the Select NRT/Objective Levels window displays. Select the measurement type and the measurements you wish to use, and click **OK**.

   The T level on the offset channel (by default, channel 11 where available) is set to 80 or 100 CL depending on the type of implant. The remaining T levels are interpolated to keep the difference between the starting T level and the objective measurement level equal to that of the offset channel.

3. Select the offset channel in the Channel Grid.
4. Select the step sizes (1 to 10 CL) and the number of stimulations (1 to 999) in the Streamlined Programming panel.
5. Click the **Increase** button  in the Set Ts area.

   The T levels increase globally by the step size indicated, and automatic stimulation of the offset channel occurs based on the number of stimulations specified.

6. Continue to increase the T levels until the threshold is reached.

   A smaller step size can be selected and the **Decrease** button  used as the threshold is neared.

7. Click the **Go Live** button  .
8. Talk to the patient and click the **Increase** button  in the Live Cs area.

   The C levels increase globally by the step size indicated.

9. Continue to adjust the C levels, watching for any indications that sound is too loud.
10. Click the **Stop** button  to stop live voice testing.

Result:

- C and T levels are set using the NRT/objective method.

Note: The default T-offset channel can be changed in the **Streamlined** tab of the Preferences window (**F9**).

Measure individual channels

When you do not want to use a streamlined programming method or streamlined programming is unavailable (for example, for ABI541, Nucleus 24 ABI or Nucleus 22 implants), T and C levels can be measured on each individual channel.

Task steps:

1. Ensure the behavioural method is selected in the Streamlined Programming panel.
2. Click the **Make All Channels Measurable** button  on the Set Levels toolbar to access the entire array (if required).
3. Select the channel you want to measure in the Channel Grid.
4. Click the **C** or **T** option button in the Set Ts and Cs panel based on which level you want to set.

   The **T & C** option button allows you to adjust the T and C levels for the selected channel simultaneously, keeping the dynamic range constant.
5. Select the step sizes (1 to 10 CL) and the number of stimulations (1 to 999).
6. Click the **Increase**  button.

   The T or C level on the selected channel increases by the step size indicated, and automatic stimulation occurs based on the number of stimulations specified.
7. Continue to click the **Increase**  and **Decrease**  buttons until the desired level is reached, adjusting the step sizes as required.

8. If you do not want to measure every channel and the MAP supports interpolation, highlight the Channel Numbers that have been measured in the Channel Grid and click the **Interpolate** button  .

   The T and/or C levels between the measured channels are automatically interpolated.

   Note:

   - Interpolation is only available for MAPs created using Monopolar stimulation modes and between channels that have the same pulse width.
   - Interpolation is not available for ABI541 or Nucleus 24 ABI implants due to the variation in T and C levels from one electrode to the next.

9. To test the T and C levels using live voice testing, click the **Go Live** button  on the Set Levels toolbar.

   Click the **Stop All Stimulations** button  on the Programming toolbar to stop live voice testing.

   Note: The **T & C** option button allows you to adjust the T and C levels for the selected channel simultaneously, keeping the dynamic range constant

Result:

- T and C levels are measured on individual channels.

Set channel levels using the Sweep function

The Sweep function allows the sequential stimulation of each active channel along the electrode array in order to check for channels that are too loud or too soft. Levels can be balanced by sweeping channels in small groups and confirming equal perception of loudness with the patient.

Task steps:

1. Click the **C** or **T** option button in the Sweep panel based on which levels you want to sweep.

   Alternatively, select a percentage from the drop-down list to sweep at a percentage of the dynamic range.

2. Click the **Selected** option button and highlight the desired Channel Numbers in the Channel Grid.

   Alternatively, click the **Channels** option button and select a number of channels from the drop-down list.

3. Select the number of sweep cycles you want to perform (1 to 20).

4. Select the channel you want to start from in the Channel Grid, and click the **Sweep Left**  or **Sweep Right**  button.

   The specified channels are sequentially stimulated in the selected direction.

   Note: To pause or stop the sweep at any time, click the **Stop All Stimulations** button  on the Programming toolbar.

Result:

- The channel levels are set using the Sweep function.

Set channel levels using the Shift function

The Shift function allows selected T and/or C levels to be increased or decreased simultaneously.

Task steps:

1. Click the **C**, **T** or **T & C** option button in the Shift panel based on which levels you wish to shift.
2. Click the **CL** option button to shift the levels by an absolute amount.

   Alternatively, click the **% of DR** option button to shift the levels by a percentage of the dynamic range for each channel.
3. Click the **All** option button to shift the whole profile.

   Alternatively, click the **Selected** option button and highlight the desired Channel Numbers in the Channel Grid.
4. Select the amount (1 to 10 CL) or the percentage (1 to 30 %) the levels are adjusted by.
5. Click the **Increase**  or **Decrease**  button.

Result:

- The specified levels shift in the selected direction by the amount indicated.

Set channel levels using the Tilt function

The Tilt function allows the T and/or C level profile to be rotated left or right around a central channel.

Task steps:

1. Click the **C**, **T** or **T & C** option button in the Tilt panel based on which levels you wish to tilt.
2. Select the amount the levels are adjusted by (1 to 10).
3. Click the **Tilt Left**  or **Tilt Right**  button.

Result:

- The specified levels rotate in the selected direction by the amount indicated.

Note: By default, a non-linear tilt is enabled. To enable a linear tilt, access **Tools** > **My Preferences**, click the **General** tab and select **Linear** from the **Tilt Profile Type** drop-down list.

Modify channel gains

In addition to the user-controlled microphone sensitivity that determines the overall gain applied to the input signal, each channel in a MAP includes an adjustable gain control. Channel gains can be modified during live voice testing to improve the perceived sound quality of a MAP.

To modify individual channel gains using the Data Grid:

Task steps:

1. Right-click on the Data Grid and select **Show Gain**.

   The gain value displays for each channel.

2. Click the desired cell and press the **Down** (↓) arrow key to select a value from the drop-down list.

Result:

- The gains of the specified channels are modified.

To modify global channel gains using the Gain Shapers window:

Task steps:

1. Click the **Modify Gains** button  on the Set Levels toolbar.

   The Gain Shapers window displays.
2. Click the desired button in the Actions box:
   -  Increase low frequency gains only
   -  Increase low and high frequency gains
   -  Increase high frequency gains only
   -  Increase all frequency gains
   -  Centre all frequency gains
   -  Decrease all frequency gains
   -  Decrease low frequency gains only
   -  Decrease low and high frequency gains
   -  Decrease high frequency gains only

   The gain is applied to each channel output and affects the stimulation levels sent to the implant.

   To view the gain value of each channel in the Gain Shapers graph, select the **Show Values** check box.
3. Click the **Close** button  to close the Gain Shapers window.

Result:

- The gains of the channels in the specified groups are modified.

Note:

- For SPEAK, ACE and MP3000 strategies, channel gains are applied before the maxima are selected and can influence the channels selected for stimulation. Reducing the gain on a given channel de-emphasises that channel's output, making it less likely to be selected. Conversely, increasing the gain emphasises the output.
- For CIS strategies, all of the activated channels are stimulated during each frame, regardless of channel amplitude. Channel gains do not influence the channels selected for stimulation, but do increase or decrease stimulation levels.

Reorder channels

Channels may need to be reordered when the tonotopic order of one or more channels is atypical.

The tonotopic order of electrodes usually follows an orderly progression of pitch from high to low from base to apex. Channels that are not in the correct pitch order do not match up correctly with the frequency table used in the MAP, and can result in poor performance. Where channels are clearly out of pitch order and there are no electrode problems, the order of the channels can be changed.

Channel reordering is particularly important for ABI541 and Nucleus 24 ABI implants as the pitch order is more complex with these devices.

Task steps:

1. Right-click on the Data Grid and select **Show Active Electrode**.
2. Click the **Make All Channels Measurable** button  on the Set Levels toolbar to make all channels measurable (if required).
3. Select the channel you wish to move, hold down the **Ctrl** key and drag the channel to the desired location.

Result:

- The Data Grid confirms the active electrode of the reordered channel is now stimulating the new channel location. The channel configuration of the adjacent channels change by one, and the affected Channel Numbers display in red. The psychophysical data of the reordered channel remains unchanged.

Note: Pitch order can be confirmed with the patient by sweeping the channels at C level after they have been balanced for loudness. See Set channel levels using the Sweep function.

Double channels

Doubling a channel allocates two channels to the same electrode pair, and links the channels to ensure they keep the same T and C levels.

Task steps:

1. Right-click on the Data Grid and select **Show Active Electrode**.
2. Click the **Make All Channels Measurable** button  on the Set Levels toolbar to access the entire array (if required).
3. Highlight the Channel Numbers you wish to exclude from the MAP in the Channel Grid.
4. Right-click on the Channel Grid and select **Disable Selected Channels**.
5. Right-click on each channel you wish to double and select **Double Channel (#)**.

Result:

- The selected channel doubles to the next basal channel, and the levels of the two channels are linked. Changes in the channel-to-electrode allocation are reflected in the Data Grid, and the affected Channel Numbers display in red.

Add notes and generate reports

A title and additional notes can be added to a MAP, and a report of the MAP details can be generated and printed.

To add a title and notes to a MAP:

Task steps:

1. Click the **Title/Notes** button  on the Set Levels toolbar.

   The Title and Notes window displays.
2. Type a title for the MAP and any additional notes in the **Title** and **Notes** boxes.
3. Click the **Close** button  to save the changes and close the Title and Notes window.

Result:

- The note is included in reports generated for the MAP.

To generate a MAP report:

Task steps:

1. Click the **Save MAP** button  on the Set Levels toolbar to save the MAP (if required).
2. Click the **MAP Report** button  on the Set Levels toolbar.
3. Use the Print toolbar to print the MAP report.

Result:

- The Report viewer displays the details of the MAP, including sound processor and implant details, channel details and MAP parameters. This content is reproduced in the printed hard copy.

Predict T and C levels

A saved MAP can be used to create an additional MAP with a different stimulation rate and pulse width, and the T and C levels can be predicted for the new MAP. The predict T and C levels function can only be used with Monopolar stimulation modes, and is not available for Nucleus 22 implants.

Task steps:

1. Open the initial saved MAP.
2. Click the **MAP Parameters** button  on the Set Levels toolbar.

   The MAP Parameters window displays.
3. Select a new value from the **Channel Rate** and/or **Pulse Width** drop-down lists.
4. Click the **Close** button  .

   The new MAP is created and the T and C levels are reset.
5. Select a single channel in the Channel Grid (typically Channel 11) and measure the T and C levels.
6. Click the **Predict Levels** button  on the Set Levels toolbar.

Result:

- Using the measured channel as a base, the shape of the T and C level profiles on the original MAP is applied to the new MAP on channels with the same stimulation mode and pulse width as the measured channel.

For more information on measuring T and C levels, see Measure individual channels.

Create progressive MAPs

After creating an initial MAP, additional MAPs can be created with the C levels automatically adjusted in each progressive MAP.

Task steps:

1. Open the initial MAP.
2. Click the **Create Progressive MAPs** button  on the Set Levels toolbar.

Result:

- The initial MAP defaults to programming slot 1, and three additional MAPs are created for the remaining programming slots:
    - Programming slot 2: MAP 1 C levels + 5 CL
    - Programming slot 3: MAP 1 C levels + 10 CL
    - Programming slot 4: MAP 1 C levels - 5 CL

Note:

- The default values by which the C levels are shifted can be changed in the **Finalise** tab of the Preferences window (**F9**).

Estimate compliance levels

Once impedance measurements have been performed, Custom Sound Pro software allows you to view the voltage compliance level for each channel in a MAP. Where a channel is out of compliance, the maximum voltage available from the implant is not sufficient to generate the desired current level on that channel which may result in perceived loudness saturation or fluctuations.

Compliance levels are automatically estimated when you do one of the following for the first time (or for the first time after changing the pulse width, stimulation mode or stimulation rate):

- Go live with a MAP
- Click a **Battery** icon  in the Battery Suitability box
- Write a program to the sound processor

If you see a message that compliance levels were not obtained, this may be due to implant communication issues. Check the coil alignment or replace the coil and re-estimate compliances. If required, contact your Cochlear representative for further assistance.

Task steps:

1. Ensure the coil is on the patient's implant.
2. Click the **Estimate Compliance Levels** button  on the Set Levels toolbar.

   Red markers display in the Channel Grid, indicating the compliance levels for the battery type selected in the Battery Suitability box.

   Note: If impedance measurements have not been performed, the red markers are not displayed.

   Where the C level on a channel exceeds the compliance level, the channel is deemed out of compliance and displays in red.
3. To display the compliance levels for another battery type, click the corresponding check box in the Battery Suitability box.

Result:

- Compliance levels display for the selected battery type.

Note:

- For ABI541 and Nucleus 24 ABI implants, compliance levels can only be estimated by clicking the **Estimate Compliance Levels** button  .
- Compliance levels cannot be estimated for Nucleus 22 implants.
- If you wish compliance levels to be estimated by default when a MAP is first opened or created, access **Tools** > **My Preferences**, click the **General** tab and clear the **Delay Auto Compliance Until Going Live** check box.

Check battery suitability

The Battery Suitability box displays the battery types applicable to the connected sound processor, and allows you to check which battery types are suitable for use with a MAP. A question mark next to a battery icon indicates battery suitability needs to be checked, and this information updates whenever the basic MAP parameters are changed.

Task steps:

1. Click a **Battery** icon  in the Battery Suitability box.

   Custom Sound Pro software performs the required measurements, and the Estimated Minimum Battery Life window displays the estimated hours for each battery type. Battery types that may not be suitable are highlighted in red or orange, and additional information displays in the Message box. Estimated hours are not available when the red marker is displayed.

2. Click the **Close** button  to close the Estimated Minimum Battery Life window.

Result:

- The Battery Suitability box displays a green, orange or red marker for each battery type:
  -  **Green:** the battery type is suitable for use with the MAP.
  -  **Orange:** the battery type may result in sound degradation or sound processor cut-outs towards the end of battery life.
  -  **Red:** the battery type cannot deliver enough power for the MAP, which may result in unreliable operation or intermittency.

Note:

- For Nucleus 22 implants, you are prompted to confirm the patient's coil is on the implant when you click a battery icon. Alternatively, if a skin flap measurement has not already been taken, you are prompted to estimate the skin flap thickness and optimise the power level.

Optimise the power level

Power level optimisation helps ensure that all channels are in compliance and to maximise sound processor battery life. It works by characterising how much power is consumed by the implant under worst-case conditions.

Custom Sound Pro software allows an automatic or manual power setting to be applied to a MAP. It is recommended Auto Power is used wherever possible, enabling the power level for the sound processor to be automatically optimised.

The type of power setting currently selected displays in the Battery Suitability box (where available):

-  Auto Power (default)
-  Manual Power

Once determined, the calculated power level displays in the MAP Parameters window, or can be viewed by placing the cursor over the power icon in the Battery Suitability box.

The power level can be optimised for the following sound processors only:

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series, CP800 Series, Freedom Hybrid and Freedom sound processors (excluding Nucleus 22 implants)

Custom Sound Pro software automatically optimises the power level when you:

- Click a **Battery** icon  in the Battery Suitability box
- Write a program to the sound processor

If the coil is not on the implant when power optimisation occurs, the power level is set to the previously saved level (where available) or the default level.

Note: When the power level is optimised, a stimulation occurs which may be heard by the patient.

CP900 Series and Freedom sound processors (Nucleus 22 implants)

Custom Sound Pro software prompts you to measure the skin flap and optimise the power level when you first do one of the following:

- Go live with a MAP
- Click a **Battery** icon  in the Battery Suitability box
- Write a program to the sound processor

The calculated power level is used for all MAPs created or opened in the same programming session.

To optimise the power level:

Task steps:

1. Ensure the coil is on the patient's implant.
2. Click the **Measure Skin Flap and Optimise Power Level** button  on the Set Levels toolbar.

   Alternatively, click **Yes** when the Auto Skin Flap Measurement prompt displays.

   Custom Sound Pro software measures the thickness of the skin flap and optimises the power level. The skin flap measurement displays in the Message box, and are included in the Session History report.

Result:

- Custom Sound Pro software measures the thickness of the skin flap and optimises the power level. The skin flap measurement displays in the Message box, and are included in the Session History report.
- If you choose not to measure the skin flap, the power level is set to the previously saved level (where available) or the default level.

Apply a manual power level

When it is not possible to use an automatic power setting, a manual power level can be applied to a MAP.

Task steps:

1. Click the **MAP Parameters** button  on the Set Levels toolbar.

   Alternatively, click the **Power** icon  in the Battery Suitability box.

   The MAP Parameters window displays.
2. Click the **Power level setting** from the parameters list.
3. Click the **Manual** option button and type a power level in the corresponding box.
4. Click the **Close** button  to close the MAP Parameters window.

Result:

- The specified power level is applied to the MAP.

Finalise

Use the Finalise screen to configure programs, apply listening environments, adjust processor settings, check battery suitability, and save the MAP to a sound processor.

Tip: The MAP number is shown in the bottom left corner of the program icons.

Note: When a new session is started, all MAPs on the sound processor will be opened and loaded into the appropriate slots on the Finalise screen. All existing program and processor settings on the sound processor will automatically be loaded and will appear in the relevant windows when these are displayed.

1. Ensure the MAP that you want to save to the sound processor is selected.
2. Configure programs for CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 and CP900 Series Sound Processors:
    a. Click one of the program icons available in the Configuration area of the Finalise screen which may include **SCAN** (**SCAN 2** for CP1110 - Nucleus 8 Sound Processors), or **Program2**.

    The Programs screen displays.

    Note: For bilateral patients with two CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 or CP900 Series Sound Processors, or one of each, the Program screen displays the configuration data for the sound processors in a side by side layout, allowing you to view and edit both to ensure they are as similar as possible.

    b. Review the default settings and make any required changes.

    Note: You can select a currently open MAP for use from the MAP drop-down list, or click the icon to display the Select MAP window and choose from all available MAPs, enabling you to revert to previous MAPs easily.

    c. To add a new program, click the plus icon on an empty program slot and configure the programming settings as required.

    Note: You can create progressive MAPs and their associated programs by clicking the icon on the Programs screen.

    d. Click **Save**.

3. Apply listening environments to MAPs for CP800 series and Freedom Sound Processors:
    a. Click one of the environment icons available in the Configuration area of the Finalise screen which may include **Everyday**  , **Noise**  , **Focus**  or **Music**  depending on the current processor type.

       The Environment Configuration screen displays.
    b. Review the default settings and make any required changes.

       Tip: Click **Defaults** to reset the listening environment to the default settings.
    c. Click **OK**.
4. Adjust processor settings CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series, and CP800 Series Sound Processors:
    a. Click **Processor Settings**.

       The Processor Settings screen displays. When the patient has two implants, the Processor Settings window displays the information for each in a side by side layout, allowing you to view and edit both to ensure they are as similar as possible.
    b. Review the processor settings and make any required changes.
    c. Click **Save**.
    d. Click Save to save any changes.

       Tip: If you did not make any changes, click **Cancel** to close the Processor Settings window.
5. Check battery suitability for powering the processor with the current MAP using battery estimation:
    a. Click **Estimate battery now** in the Battery Estimation box.
    b. Click on one of the battery symbols to display the Estimated Minimum Battery Life window with additional information.
    c. Click the **Close** button  to close the Estimated Minimum Battery Life window.

6. Click **Save** to write the programs to the sound processor.

   A  **Save successful** message appears when the configuration has been written to the sound processor and battery estimation is carried out for the sound processor if it has not been done already.

7. Add session notes:

   a. Click the **Today's Session Notes** icon  .

      The **Today's Session Notes** text area displays.

   b. Type session notes into the text area.

   c. Click the **Today's Session Notes** icon  again.

      The **Today's Session Notes** text area closes.

8. Click **Patient Report** and print the report if you want to give to the patient a report to take home.

   Click **Clinical Report** and then print the report if you want to provide a report for other clinicians or for clinical records.

9. Click **End Session** to end the fitting session.

   If any unsaved changes to MAPs are present, a save confirmation message appears. Click **Yes** to save MAP changes.

   The Patients screen displays, and the Session Details and Take Home reports display in separate tabs in the Report Viewer.

10. Click the **Close** button  to close each of the reports in the Report Viewer.

Program settings

Use the Programs screen to configure MAP, volume, and sensitivity variables for the current program for CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7 and CP900 Series Sound Processors.

CP1110 - Nucleus 8 Sound Processors

CP1110 - Nucleus 8 Sound Processors		
Program Settings	Default setting	
	SCAN 2 	Program 2 
MAP: sets the MAP for use.  **Note:** The drop-down list displays only currently open MAPs for selection.		
General		
Volume: sets the volume level.	6	6
Sensitivity: sets the sensitivity level.	12	12
SCAN 2: turns SCAN 2 on or off.	✓	
SCAN 2 FF: enables the SCAN 2 program with automated ForwardFocus (SCAN 2 FF). SCAN 2 FF automatically manages ForwardFocus across different listening situations to help the user reduce distracting sounds occurring behind the patient.		
Icon: if Custom programming is being used, an icon can be selected for the Nucleus Smart App that is associated with the program. Either a numbered icon can be selected, or one of 10 icons depicting a scene are available.  **Note:** The choice of icon does not dictate the program type or place any restrictions on configuration.		✓

Microphone Directionality		
Standard: Fixed and Adaptive microphone directionality are disabled.	✓	✓
Fixed (zoom): enables the microphones to be focused in the forward direction.	✓	
Adaptive (Beam): enables an adaptive beamformer designed to improve the signal-to-noise ratio of speech coming from one direction in a noisy environment.	✓	
Audibility		
Boost soft sounds (ADRO): if selected, ADRO enables a digital pre-processing algorithm designed to make soft sounds more audible in quiet and maintain comfort for loud sounds. If custom programming is being used, the **More (Whisper)** check box is also available. Whisper™ enables a fast-acting compression scheme for improved access to soft and moderately loud sounds. This setting can be enabled if the Boost soft sounds (ADRO) check box is selected.	✓	✓
Soften loud sounds (ASC): if selected, Autosensitivity Control is enabled.	✓	✓
The **Less (60dB)** check box is available with SCAN 2 and Program 2 with the Autosensitivity Control breakpoint set to 60 decibels. This setting can be enabled if the Soften loud sounds (ASC) check box is selected.		
Noise Reduction		
Background (SNR-NR): enables automatic background noise reduction.	✓	✓
Wind (WNR): enables automatic wind noise reduction. Comfort is improved when wind is automatically detected, by switching to a low noise microphone setting and suppressing loud channels.	✓	✓
Note: For CP1110 - Nucleus 8 Sound Processors, ADRO, Autosensitivity™, Whisper and SNR-NR apply to electric processing only, while Adaptive (Beam) and WNR apply to both electric and acoustic processing.		

CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors

CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors		
Program Settings	Default setting	
	SCAN 	Program 2 
MAP: sets the MAP for use. **Note:** The drop-down list displays only currently open MAPs for selection.		
General		
Volume: sets the volume level.	6	6
Sensitivity: sets the sensitivity level.	12	12
SCAN: turns SCAN on or off.	✓	
Icon: if Custom programming is being used, an icon can be selected for the Nucleus Smart App that is associated with the program. Either a numbered icon can be selected, or one of 10 icons depicting a scene are available. **Note:** The choice of icon does not dictate the program type or place any restrictions on configuration.		✓
Microphone Directionality		
Standard: Fixed and Adaptive microphone directionality are disabled.	✓	✓
Fixed (zoom): enables the microphones to be focused in the forward direction.	✓	
Adaptive (Beam): enables an adaptive beamformer designed to improve the signal-to-noise ratio of speech coming from one direction in a noisy environment.	✓	

Audibility		
Boost soft sounds (ADRO): if selected, ADRO enables a digital pre-processing algorithm designed to make soft sounds more audible in quiet and maintain comfort for loud sounds. If custom programming is being used, the **More (Whisper)** check box is also available. Whisper™ enables a fast-acting compression scheme for improved access to soft and moderately loud sounds. This setting can be enabled if the Boost soft sounds (ADRO) check box is selected.	✓	✓
Soften loud sounds (ASC): if selected, Autosensitivity Control is enabled.	✓	✓
The **Less (60dB)** check box is available with SCAN and Program 2 with the Autosensitivity Control breakpoint set to 60 decibels. This setting can be enabled if the Soften loud sounds (ASC) check box is selected.		
Noise Reduction		
Background (SNR-NR): enables automatic background noise reduction.	✓	✓
Wind (WNR): enables automatic wind noise reduction. Comfort is improved when wind is automatically detected, by switching to a low noise microphone setting and suppressing loud channels.	✓	✓
Note: For CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors, ADRO, Autosensitivity™, Whisper and SNR-NR apply to electric processing only, while Adaptive (Beam) and WNR apply to both electric and acoustic processing.		

CP900 Series Sound Processors

CP900 Series Sound Processors		
Program Settings	Default setting	
	SCAN 	Program 2 
MAP: Sets the MAP for use. **Note:** The drop-down list displays only currently open MAPs for selection.		
General		
Volume: sets the volume level.	6	6
Sensitivity: sets the sensitivity level.	12	12
SCAN: turns SCAN on or off.	✓	
Icon: if Custom programming is being used, an icon can be selected for the Nucleus Smart App that is associated with the program. Either a numbered icon can be selected, or one of 10 icons depicting a scene are available. **Note:** The choice of icon does not dictate the program type or place any restrictions on configuration.		✓
Microphone Directionality		
Standard: Fixed and Adaptive microphone directionality are disabled.	✓	✓
Fixed (zoom): enables the microphones to be focused in the forward direction.	✓	
Adaptive (Beam®): enables an adaptive beamformer designed to improve the signal-to-noise ratio of speech coming from one direction in a noisy environment.	✓	

Audibility		
Boost soft sounds (ADRO): if selected, ADRO enables a digital pre-processing algorithm designed to make soft sounds more audible in quiet and maintain comfort for loud sounds. If custom programming is being used, the **More (Whisper)** check box is also available. Whisper™ enables a fast-acting compression scheme for improved access to soft and moderately loud sounds. This setting can be enabled if the Boost soft sounds (ADRO) check box is selected.	✓	✓
Soften loud sounds (ASC): if selected, Autosensitivity Control is enabled.	✓	✓
The **Less (60dB)** check box is available with SCAN and Program 2 with the Autosensitivity Control breakpoint set to 60 decibels. This setting can be enabled if the Soften loud sounds (ASC) check box is selected.		
Noise Reduction		
Background (SNR-NR): enables automatic background noise reduction.	✓	✓
Wind (WNR): enables automatic wind noise reduction. Comfort is improved when wind is automatically detected, by switching to a low noise microphone setting and suppressing loud channels.	✓	✓
Note: For CP900 Series Sound Processors, ADRO, Autosensitivity™, Whisper and SNR-NR apply to electric processing only, while Adaptive (Beam) and WNR apply to both electric and acoustic processing.		

Use the Environment Configuration screen to configure options for the current program with Freedom and CP800 Series Sound Processors.

CP800 Series Sound Processors

CP800 Series Sound Processors				
Program Settings	Default setting			
				
			CP810 Sound Processors only	
MAP: sets the MAP for use. **Note:** The drop-down list displays only currently open MAPs for selection.				
Volume: sets the volume level.	6	6	6	6
Sensitivity: sets the sensitivity level.	12	12	12	12
SmartSound options				
ADRO: enables a digital pre-processing algorithm designed to make soft sounds more audible in quiet and maintain comfort for loud sounds.	✓	✓	✓	✓
Autosensitivity: enables the automatic adjustment of microphone sensitivity based on the noise floor of the surrounding environment.	✓	✓	✓	
Zoom: enables the microphones to be focused in the forward direction.		✓		
Beam: enables an adaptive beamformer designed to improve the signal-to-noise ratio of speech coming from one direction in a noisy environment.			✓	
Whisper: enables a fast-acting compression scheme for improved access to soft and moderately loud sounds.				✓
None: enables SmartSound options to be disabled.				
Parameters				
Auto-sens. Brkpnt-SPL (dB): specifies the sound pressure level at which the Autosensitivity breakpoint is set. When the noise floor is above or below the breakpoint, the Autosensitivity control gradually reduces or increases the sensitivity respectively.	57			

Freedom Hybrid and Freedom Sound Processors

Freedom Hybrid and Freedom sound processors				
Program Settings	Default setting			
				
MAP: sets the MAP for use. **Note:** The drop-down list displays only currently open MAPs for selection.				
Volume: sets the volume level.	6	6	6	6
Sensitivity: sets the sensitivity level.	12	12	12	12
SmartSound options				
ADRO: enables a digital pre-processing algorithm designed to make soft sounds more audible in quiet and maintain comfort for loud sounds.	✓	✓	✓	✓
Autosensitivity: enables the automatic adjustment of microphone sensitivity based on the noise floor of the surrounding environment.		✓	✓	
Beam: enables an adaptive beamformer designed to improve the signal-to-noise ratio of speech coming from one direction in a noisy environment.			✓	
Whisper: enables a fast-acting compression scheme for improved access to soft and moderately loud sounds.				✓
None: enables SmartSound options to be disabled.				
Note: For Freedom Hybrid sound processors, ADRO, Autosensitivity and Whisper apply to electric processing only, while Beam applies to both electric and acoustic processing.				

Parameters	Adults	Paediatrics
Auto-sens. Brkpnt-SPL (dB): specifies the sound pressure level at which the Autosensitivity breakpoint is set. When the noise floor is above or below the breakpoint, the Autosensitivity control gradually reduces or increases the sensitivity respectively.	57	57
Telecoil Mixing: enables the sound processor to receive a mix of telecoil and microphone input.		
Telecoil Always On: enables the telecoil on the sound processor to be on at all times.		

Sensitivity Mode: when Manual is selected, enables the sensitivity to be adjusted using the controls on the sound processor. When Fixed is selected, the sensitivity is applied at the level set in the Program box and cannot be adjusted by the patient.	Manual	Manual
Volume Control: enables the volume to be adjusted using the controls on the sound processor. When cleared, the volume is applied at the level set in the Program box and cannot be adjusted by the patient.	✓	✓
Accessory Mixing Ratio: specifies the ratio (1:1 to 10:1) of the accessory input in relation to the microphone input.	2:1	1:1
Telecoil Mixing Ratio: specifies the ratio (1:1 to 10:1) of the telecoil input in relation to the microphone input.	3:1	1:1
Tones and indicator lights	Adults	Paediatrics
Private Tones: delivers a private tone when a warning is signalled.	✓	✓
Private Key Press Notification: delivers a private tone when a key is pressed on the sound processor.	✓	✓
Public Tones: delivers a public tone when a warning is signalled.		✓
Public Key Press Notification: delivers a public tone when a key is pressed on the sound processor.		✓
Indicator Light - Sound: displays a light on the sound processor to indicate an incoming audio signal is being received (Freedom sound processors only).		✓
Indicator Light - Key Presses and Alerts: displays a light on the sound processor when a warning is signalled or a key is pressed on the sound processor or remote assistant. The light is only applicable when the coil is on the implant.		✓

Create progressive MAP programs

From the Program screen, additional programs with MAPs can be created with the C levels automatically adjusted in each progressive MAP.

Task steps:

1. Select or create a program with the desired MAP. This will be the parent MAP.
2. Click the **Create Progressive MAPs** button  .
3. The Progressive MAPs screen will open.
4. The parent MAP defaults to programming slot 1.

   Use the arrows next to the values for the remaining program slot to set the shift to C level value based on patient needs.
5. Click Continue.

Result:

- The parent MAP defaults to programming slot 1, and three additional progressive MAPs are created in the remaining programming slots based on the selected C level shift.

Note:

- This is only available for CP900 Series Processor or later.
- If a shifted C level will put the MAP out of compliance the MAP will not be created.
- In most cases, the progressive MAP feature will create MAPs with increasing C-levels. If T levels have not been measured on the parent MAP used, then both T and C levels will be adjusted.
- The default values by which the C levels are shifted can be changed in the **Finalise** tab of the Preferences window (**F9**).

Processor settings

Use the Processor Settings window to adjust the way that CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 series, and CP800 Series Sound Processors work. You can use the Adult or Paediatrics defaults to provide a starting point for adjustments.

When the patient has two implants, the Processor Settings window displays the information for each in a side by side layout, allowing you to view and edit both to ensure they are as similar as possible.

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors		
Processor Configuration	Default setting	
	Adults	Paediatrics
Patient-Adjustable Settings		
Processor Controls: for CP1110 - Nucleus 8, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors, locks or enables the button on the sound processor.		
Telecoil Mixing Ratio: for CP1110 - Nucleus 8, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors, specifies the ratio of the telecoil input in relation to the microphone input.	3:1	1:1
Accessory Mixing Ratio: specifies the ratio of the accessory input in relation to the microphone input.	2:1	1:1
Processor Lights: displays a light on the sound processor to indicate functionality or fault conditions. The options available in the list are: • Child - indicator lights are displayed for auxiliary input, alert states and program changes when the sound processor is on or off the head. • Adult - indicator lights are displayed for alert states or program changes when the sound processor is on or off the head. For auxiliary input, indicator lights are only displayed when the sound processor is off the head.	Adult	Child
Processor Beeps (Private Tones): delivers a private tone when a warning is signalled or a key is pressed on the sound processor or remote control.	✓	✓

Clinician-Adjustable Settings		
Allow user controlled ForwardFocus: (not available for CP1002 - Nucleus 7 S and CP1001 - Nucleus 7 SE Sound Processors) enables reduction of noise occurring behind the patient. When selected, ForwardFocus can be turned on or off by the patient using the Nucleus Smart App.		
Allow Telecoil: for CP1110 - Nucleus 8, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors, enables the telecoil to be activated on the sound processor. When selected, Telecoil can be turned on or off by the patient using the sound processor or the remote control or Nucleus Smart App.		
Auto Processor Off: enables the sound processor to turn off automatically when the coil is off the implant for more than two minutes.	✓	✓ *CP1150 - Kanso 2 only
Soft MAP Start Duration: specifies the sound processor start up duration to ramp up the volume from a soft level to the final level set in the MAP. If a patient experiences sound processor start up noise, using a value greater than 0 seconds may minimise this noise.	0 seconds	0 seconds
mySmartSound Settings		
Allow Volume Control: enables the volume to be adjusted using the controls on the remote control or the Nucleus Smart App. When cleared, the volume is applied at the level set in the Program box and cannot be adjusted by the remote control or the Nucleus Smart App.	✓	✓
Allow Sensitivity Control: enables the sensitivity to be adjusted using the controls on the remote control or the Nucleus Smart App. When cleared, the sensitivity is applied at the level set in the Program box and cannot be adjusted using the remote control or the Nucleus Smart App. If selected, the Loudness Control Preference check box becomes enabled.		
Loudness Control Preference: specifies the loudness control option for the remote control if the Allow Volume Control and Allow Sensitivity Control options are selected. Available options are Volume or Sensitivity.	Volume	Volume
Allow Master Volume Limit Control: enables the user to make adjustments to the Master Volume control settings from the Nucleus Smart App.		

Limit: enables MV Limit to be set to plus or minus 10 CL or to Unlimited. This list is only visible if the Allow Master Volume Limit Control option is selected.	10 CL	10 CL
Allow Bass and Treble Control: enables Bass and Treble settings to be adjusted using the Nucleus Smart App. When cleared, no adjustments are possible. The limit is plus or minus 6 CL.		
Smart bimodal streaming hearing aid		
Link smart bimodal streaming hearing aid: allows linking of a patient's compatible smart bimodal streaming hearing aid with their CP1110 - Nucleus 8, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processor. Any smart bimodal streaming hearing aids that are linked to the patient's CP1110 - Nucleus 8, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processor are listed. If a patient upgrades their smart bimodal streaming hearing aid, the link between the hearing aid and sound processor can be updated. This option is not available for bilateral patients.		

CP900 Series Sound Processors

CP900 Series Sound Processors		
Processor Configuration	Default setting	
	Adults	Paediatrics
Patient-Adjustable Settings		
Processor Controls: locks the buttons on the sound processor.		
Telecoil Mixing Ratio: specifies the ratio of the telecoil input in relation to the microphone input.	3:1	1:1
Accessory Mixing Ratio: specifies the ratio of the accessory input in relation to the microphone input.	2:1	1:1
Processor Lights: displays a light on the sound processor to indicate functionality or fault conditions. The options available in the list are: • Child - indicator lights are displayed for microphone input, auxiliary input, alarms and processor auto-off when the sound processor is on or off the patient's head. • Monitor - indicator lights are displayed for auxiliary input when the sound processor is off the patient's head, alarms and processor auto-off. • Adult - indicator lights are displayed for alarms when the sound processor is off the patient's head and processor auto-off.	Monitor	Child
Processor Beeps (Private Tones): delivers a private tone when a warning is signalled or a key is pressed on the sound processor or remote assistant.	✓	✓

Clinician-Adjustable Settings		
Allow Telecoil: enables the telecoil to be activated on the sound processor. When selected, Telecoil can be turned on or off by the patient using the sound processor or the remote assistant. **Note:** For CP950 - Kanso Sound Processors, Allow Telecoil is not selected by default, and is unavailable when the total stimulation rate (TSR) is under 7200 Hz. **Note:** For CP950 - Kanso Sound Processors with CI600 series implants, the Allow Telecoil option is not available.	✓	✓
Allow Auto Telecoil: enables the sound processor to automatically activate the telecoil in response to an incoming signal. When selected, Auto Telecoil can be turned on or off by the patient using the remote assistant. Allow Telecoil must be selected to allow Auto Telecoil to be enabled. **Note:** This feature is not supported with the CP950 - Kanso Sound Processor.	✓	
Auto Processor Off: enables the sound processor to turn off automatically when the coil is off the implant for more than two minutes. **Note:** For Nucleus 22 implants, this setting is not available.	✓	
Processor Interface: specifies the user interface option for the sound processor. When Simple is selected, volume and sensitivity cannot be adjusted using the controls on the sound processor. When Advanced (Volume) or Advanced (Sensitivity) is selected, volume or sensitivity respectively can be adjusted via the sound processor in addition to the remote assistant.	Simple	Simple
Soft MAP Start Duration: specifies the sound processor start up duration to ramp up the volume from a soft level to the final level set in the MAP. If a patient experiences sound processor start up noise, using a value greater than 0 seconds may minimise this noise.	0 seconds	0 seconds

Patient Hearing Adjustments		
Allow Volume Control: enables the volume to be adjusted using the controls on the remote assistant. When cleared, the volume is applied at the level set in the Program box and cannot be adjusted by the remote assistant.	✓	✓
Allow Sensitivity Control: enables the sensitivity to be adjusted using the controls on the remote assistant. When cleared, the sensitivity is applied at the level set in the Program box and cannot be adjusted using the remote assistant. If selected, the Loudness Control Preference check box becomes enabled.		
Loudness Control Preference: specifies the loudness control option for the remote assistant if the Allow Volume Control and Allow Sensitivity Control options are selected. Available options are Volume or Sensitivity.	Volume	Volume
Allow Master Volume Control: enables the user to make adjustments to the Master Volume settings from a remote assistant.		
Master Volume Limit: enables MV Limit to be set to plus or minus 10 CL or to Unlimited. This list is only visible if the Allow Master Volume Control option is selected.	10 CL	10 CL
Allow Bass & Treble Control: enables Bass and Treble settings to be adjusted using the controls on the remote assistant. When cleared, no adjustments are possible. The limit is plus or minus 6 CL.		

CP800 Series Sound Processors

CP800 Series Sound Processors		
Processor Configuration	Default setting	
	Adults	Paediatrics
Patient-Adjustable Settings		
Processor Button Lock: locks the buttons on the sound processor.		
Telecoil Mixing Ratio: specifies the ratio of the telecoil input in relation to the microphone input (CP810 Sound Processors only).	3:1	1:1
Accessory Mixing Ratio: specifies the ratio of the accessory input in relation to the microphone input (CP810 Sound Processors only).	2:1	1:1
Indicator Light - Sound: displays a light on the sound processor to indicate an incoming audio signal is being received.		✓
Indicator Light - Key Presses and Alerts: displays a light on the sound processor when a warning is signalled or a key is pressed on the sound processor or remote assistant. The light is only applicable when the coil is on the implant.		✓
Processor Beeps (Private Tones): delivers a private tone when a warning is signalled or a key is pressed on the sound processor or remote assistant.	✓	✓
 **Note:** Patients can change the patient-adjustable parameters at any time using the remote assistant.		

Clinician-Adjustable Settings		
Allow Telecoil: enables the telecoil to be activated on the sound processor. When selected, Telecoil can be turned on or off by the patient using the sound processor or the remote assistant (CP810 Sound Processors only).	✓	✓
Allow Auto Telecoil: enables the sound processor to automatically activate the telecoil in response to an incoming signal. When selected, Auto Telecoil can be turned on or off by the patient using the remote assistant. Allow Telecoil must be selected to allow Auto Telecoil to be enabled (CP810 Sound Processors only).	✓	
Auto Processor Off: enables the sound processor to turn off automatically when the coil is off the implant for more than two minutes.	✓	
Processor Interface: specifies the user interface option for the sound processor. When Simple is selected, volume and sensitivity cannot be adjusted using the controls on the sound processor. When Advanced (Volume) or Advanced (Sensitivity) is selected, volume or sensitivity respectively can be adjusted via the sound processor in addition to the remote assistant.	Simple	Simple
Patient Hearing Adjustments		
Allow Volume Control: enables the volume to be adjusted using the controls on the remote assistant. When cleared, the volume is applied at the level set in the Program box and cannot be adjusted by the remote assistant.	✓	✓
Allow Sensitivity Control: enables the sensitivity to be adjusted using the controls on the remote assistant. When cleared, the sensitivity is applied at the level set in the Program box and cannot be adjusted using the remote assistant.	✓	✓
Allow Hearing Profile Adjustments: enables the patient to use Remote Assistant Fitting to adjust a MAP created by their clinician using Custom Sound Pro software. The MAP must meet criteria to be adjusted via Remote Assistant Fitting.		
Allow Creation of New Hearing Profile: enables the patient to use Remote Assistant Fitting to create a brand new MAP using their remote assistant if the Allow Hearing Profile Adjustments option is selected.		

Estimate battery

Battery Estimation allows you to check which battery types are suitable for use with a MAP. Battery Estimation takes place automatically when writing to a sound processor and can also be initiated using the **Estimate battery now** button. For CP1150 - Kanso 2 Sound Processors the battery health can also be checked. The battery health check indicates if the battery in the CP1150 can be charged or if it needs to be replaced.

The battery types may include:

	2 Zinc Air, 2 Nucleus Zinc Air
	3 Zinc Air
	Compact Rechargeable, Nucleus Compact
	Lithium ion
	Standard Rechargeable, Nucleus Power Extend
	2 AAA

Task steps:

1. Click **Estimate battery now** in the Battery Estimation box.

   Custom Sound Pro software performs the required measurements. The Battery suitability box displays, showing a green, orange, red, or blue marker for each battery type, and the estimated number of hours from fully charged to fully depleted:

   -  **Green:** the battery type is suitable for use with the MAP.
   -  **Orange:** the battery type may result in sound degradation or sound processor cut-outs towards the end of battery life.
   -  **Red:** the battery type cannot deliver enough power for the MAP, which may result in unreliable operation or intermittency.
   -  **Blue:** the battery type has not been checked.

   Battery types that may not be suitable are highlighted in red or orange, and additional information displays in the Message box. Estimated hours are not available when a red or blue marker is displayed.

2. Click on one of the battery symbols to display the Estimated Minimum Battery Life window with additional information.
3. Click the **Close** button  to close the Estimated Minimum Battery Life window.

Result:

- The Battery suitability box displays a green, orange, red, or blue marker for each battery type, and the estimated number of hours from fully charged to fully depleted.

 **Note:**

- For Nucleus 22 implants, you are prompted to confirm the patient's coil is on the implant when you click a battery icon. Alternatively, if a skin flap measurement has not already been taken, you are prompted to estimate the skin flap thickness and optimise the power level.

Estimated Minimum Battery Life

Displays the current MAP and auto power setting for each Program, as well as the estimated number of hours that various battery types can be expected to last when powering a sound processor with the specified settings.

Link smart bimodal streaming devices for bimodal patients

For patients with a cochlear implant on one side and a hearing aid on the other side, their smart bimodal streaming devices (CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processor and a compatible smart bimodal streaming hearing aid) can be linked. Linked smart bimodal streaming devices can be simultaneously paired to an iPhone, iPad, iPod touch or compatible Android devices.

The smart bimodal streaming devices become linked when the ID of each device is written to the other during a fitting session.

During a fitting session, the steps to link smart bimodal streaming devices are:

1. Ask the patient to turn off Bluetooth on their compatible device if they have already paired their smart bimodal streaming hearing aid with the device.
2. Connect the Noahlink Wireless programming interface.
3. Ensure that any software using the Noahlink Wireless device is closed.
4. On the Processor Configuration window, click Link.
5. Put the smart bimodal streaming hearing aid into pairing mode.
6. Identify the patient's hearing aid.
7. Link the smart bimodal streaming devices.

Hearing aid not connecting?

If the patient's hearing aid cannot be found check that:

- The hearing aid is in pairing mode so that Noahlink Wireless can discover the hearing aid. To put the hearing aid in pairing mode either:
    - Open and then close the battery door
    - If there is no battery door, press the button for 5 seconds to switch off the hearing aid then press the button for 5 seconds to switch on the hearing aid. In some hearing aids, an LED lights up when the hearing aid turns on, and flashes three times when the hearing aid turns off.
- The battery in the hearing aid has sufficient charge.
- The patient's device has Bluetooth turned off.

  If the patient has already paired their smart bimodal hearing aid with their compatible device, Noahlink Wireless cannot discover the hearing aid if Bluetooth is turned on.

Don't see the hearing aid you're looking for?

Not all smart bimodal streaming hearing aids can be linked with a CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processor. If the patient's hearing aid does not appear in the Linking Hearing Devices screen, or if it appears but cannot be selected, it may not be a compatible hearing aid. To see the list of specific compatible hearing aids, go to the following location:

www.cochlear.com/nucleus/compatibility

If the patient has a compatible hearing aid that does not appear, try to link the sound processor and hearing aid again.

Shutting down

To shut down Custom Sound Pro software:

1. Select **File** > **Exit** from the top menu.

   If you have an open patient with changes to new or opened MAPs, you will be given the option to:

   - **Save** the MAPs and exit,
   - **Don't save** any changes and exit or
   - **Cancel**.

Result:

- The Custom Sound Pro software application will close.

My clinic

Use the My clinic functionality to edit the current clinic's details, edit the information of existing clinicians, and create new clinician entries.

Set clinician preferences

You can set your own default preferences without the need for administrator permission. These preferences control certain Custom Sound Pro software behaviour when you log in.

Task steps:

1. Click on **Tools > My preferences** in the Menu bar.

   The Clinician Details and Preferences window displays with the **Personal** tab selected.

2. Click each tab in turn and select the desired settings (see the table in the Clinician Details and Preferences window topic).

3. Click **Save** to save the changes and close the Clinician Details and Preferences window.

    **Note:** The **Save** button is available only if changes have been made to the clinician preferences.

Result:

- The clinician preferences are updated.

Create a clinician

The username entered when the Custom Sound Pro software database is installed is automatically created as a clinician with clinic administrator rights. Users with clinic administrator rights can create additional clinicians and edit preferences for all clinicians as required. Creating individual users allows each clinician to set their own preferences. The patient database is shared across all users.

Task steps:

1. Click on **Tools > My Clinic** in the Menu bar.
2. Click the **Create New Clinician** link.

   The Clinician Details and Preferences window displays with the **Personal** tab selected.
3. Type the clinician’s name in the **Username** box.

   This box is mandatory.
4. Type the clinician's email address in the **Email** box.

   The email address box is optional but automatically populates the Feedback form when providing feedback about Custom Sound Pro software to Cochlear.
5. To give the clinician administrator rights, select the **Clinic Administrator** check box.

   Users with administrator rights can add or edit other clinicians.
6. To set a password for the clinician, click **Set Password**, type the password details and click **OK**.
7. To set additional preferences for the clinician, click each of the tabs in the Clinician Details and Preferences window and select the desired settings.

   Clinicians can set their own preferences at any time.
8. Click **Save** to save the changes and close the Clinician Details and Preferences window.

   The clinician displays in the Registered Clinicians list.
9. Create additional clinicians as desired, or click the **Close** button  to close the Clinic window.

Result:

- The new clinician ID is ready for use.

Note: If Quick/Standard Programming has been installed as a regional option, **Quick Programming** or **Standard Programming** can be selected in the **Personal** tab of the Preferences window. Standard programming provides access to all clinical features in Custom Sound Pro software, while quick programming provides access to the most used clinical features only.

Edit selected clinician

If you have clinic administrator permission, you can edit the details for other clinicians that have been registered in Custom Sound Pro software. These preferences control certain Custom Sound Pro software behaviour when you log in.

Task steps:

1. Click on **Tools > My clinic** in the Menu bar.

   The My Clinic window displays a list of registered clinicians.
2. Select a clinician to edit from the list.
3. Click the Edit Selected Clinician link from Select a task.

   The Clinician Details and Preferences window displays with the **Personal** tab selected.
4. Click each tab in turn and select the desired settings (see the table in the Clinician Details and Preferences window topic).
5. Click **Save** to save the changes and close the Clinician Details and Preferences window.

   Note: The **Save** button is available only if changes have been made to the clinician preferences.

Result:

- The selected clinician preferences are updated.

Edit clinic details

If you have clinic administrator permission, you can edit clinic details.

Task steps:

1. Click on **Tools > My Clinic** in the Menu bar.

   The My Clinic window displays a list of registered clinicians.
2. Click the **Edit Clinic Details** link from Select a task.

   The Clinic Details window General tab displays.
3. From this tab you can edit the **Clinic Name**, **Cochlear ID** and **Processor diagnostics** options.

   Note: The **Processor diagnostics** field will only be show if the 'CREM Data Logger' function has been enabled under regional options.

   The OK button becomes active as soon as a change has been made.
4. Click **OK** to save the changes and close the Clinic Details window.

Result:

- The clinic details are modified.

Manage auto-updates

If you have clinic administrator permission, you can manage the auto-update preferences for Custom Sound Pro software.

Task steps:

1. Click on **Tools > My Clinic** in the Menu bar.

   The My Clinic window displays a list of registered clinicians.
2. Click the **Edit Clinic Details** link.

   The Clinic Details window General tab displays.
3. Select the **Auto Update** tab.
4. Select one of the auto-update options from the Preferences.
   - Automatically download but ask me to install update on application close.
   - Notify me of updates. I will choose when to download and install the update.
   - Do not download or install update.

   The OK button becomes active as soon as a change has been made.
5. Click **OK** to save the changes and close the Clinic Details window.

Result:

- The auto-update preferences are modified.

Set or change clinician's login password

Set a password to prevent unauthorised access and change that password when necessary.

Task steps:

1. Click on **Tools > My preferences** in the Menu bar.

   The Clinician Details and Preferences window displays with the **Personal** tab selected.

2. Click **Set Password**.

   The Set Password window displays.

3. To set the password:
   a. Type a password into the **Password** box.
   b. Type the same password into the **Confirm Password** box.
4. To change the password:
   a. Delete the contents of both the **Password** and **Confirm Password** boxes.
   b. Type a password into the **Password** box.
   c. Type the same password into the **Confirm Password** box.
5. Click **OK**.

   Note: The password cannot be set or changed unless The **Password** and **Confirm Password** boxes have identical contents. If they do not, a message appears indicating this issue.

Result:

- The clinician password is set or changed.

Clinician Details and Preferences

Use the Clinician Details and Preferences screen to set individual clinician Custom Sound Pro software preferences.

The following settings can be selected from the tabs in the Preferences window:

Personal	
Username	Contains the user name of the clinician.
Email	Contains the email address of the clinician. This entry automatically populates the Feedback form when providing feedback about Custom Sound Pro software to Cochlear.
Cochlear ID	Contains the Cochlear ID of the clinician.
This account is disabled	If you have administrator permission, select this box to disable a clinician account that you are creating or updating. Clear the box to enable the clinician account.
Clinic administrator	If you have administrator permission, select this box to grant administrator privileges when creating or modifying a clinician account. Clear the box to remove administrator privileges.
Mute PC audio	All PC audio output from Custom Sound Pro software will be muted.
Help improve Custom Sound by automatically sending de-identified usage statistics to Cochlear	Select this box to permit Custom Sound Pro software to send usage statistics to Cochlear. Clear the box to revoke permission to send the usage statistics.
Automatically send error reports to Cochlear	Select this box to permit Custom Sound Pro software to automatically send error reports to Cochlear. These reports include clinic, clinician name, clinician email, de-identified patient .cdx file and error details, for the purpose of resolving the error. Clear the box to revoke permission to automatically send the error report.
Set password	Access the Set Password window to set or update the clinician's password.
Patient List	
Display items	Specify the items for display in the Patient List screen by checking them in this tab. Cleared items will not be shown.

New MAPs	
Children	Specifies the eldest age that patients are considered as children. Sets the default settings when you create new MAPs for children, such as program strategy, stimulation rate and maxima. If you select new MAPs to be based on thresholds, when you create a new patient, after impedances are measured, the next step is to measure thresholds. If you select new MAPs to be based on Population Mean, when you create a new patient, the next step is to adjust the master volume from Global Adjustments. If you select new MAPs to be based on AutoNRT, when you create a new patient, after AutoNRT, the next step is to adjust the master volume from Global Adjustments.
Adults and older children	Indicates the age at which patients are considered as older children and adults based on the age specified for children. Sets the default settings when you create new MAPs for adults and older children, such as program strategy, stimulation rate and maxima. If you select new MAPs to be based on thresholds, when you create a new patient, after impedances are measured, the next step is to measure thresholds. If you select new MAPs to be based on Population Mean, when you create a new patient, the next step is to adjust the master volume from Global Adjustments. If you select new MAPs to be based on AutoNRT, when you create a new patient, after AutoNRT, the next step is to adjust the master volume from Global Adjustments.

AutoNRT	
General	**Number of electrodes:** the specified number of electrodes is selected by default when performing AutoNRT measurements.
Display	**Show traces during AutoNRT:** the NRT Traces window displays automatically when performing AutoNRT.
	Show NRT/objective markers: NRT/objective level markers display in the Channel Grid.
Intraoperative Options	**Perform electrode conditioning:** electrodes are conditioned at the specified current level prior to measuring the NRT level.
	Electrode conditioning current level: electrodes are conditioned at the specified current level prior to measuring the NRT level.
	Perform enhanced interpolation: automatic interpolation of NRT levels is enabled.
Post-operative Options	**Starting current level:** each channel starts measuring the NRT level from the specified current level.
	Auto increase waiting time: the AutoNRT algorithm waits the specified amount of time before increasing the stimulus required to perform the next measurement.

Adjust	
Global Adjustments	**Step size:** specifies the default size of adjustments of T and C levels on the Global Adjustments screen.
Comfort	**Step size:** specifies the default size of adjustments of T and C levels on the Comfort screen.
Thresholds	**Up step size:** specifies the default size of the increase in T levels on the Thresholds screen.
	Down step size: specifies the default size of the decrease in T levels on the Thresholds screen.
Display	**Show electrode numbers:** displays the corresponding electrode number below each electrode on the graphs of the Global Adjustments, Comfort, and Threshold screens.
	Show compliance limits: displays the compliance limit of each electrode on the graphs of the Global, Comfort, and Threshold screens.
	Show NRT values: displays the NRT value for those electrodes that have been measured on the graphs of the Global Adjustments, Comfort, and Threshold screens.
	Show previously measured electrodes in Thresholds: displays those electrodes from a saved MAP or a new MAP based on a saved MAP, that have been measured on the Threshold screens in a previous session. A blue dot shows measured electrodes. Hovering over the dot will display the date and the MAP number of the measured electrode.
	Use in touch mode: changes the controls on the Adjust screens so that they are optimised for use on tablets.

Set Levels	
Levels	**Up step size:** specifies the default size of the increase in a T or C level that results from clicking the keyboard **Up** arrow.
	Down step size: specifies the default size of the decrease in a T or C level that results from clicking the keyboard **Down** arrow.
	Number of sweep cycles: specifies the default number of sweep cycles.
Global Modifier	**Shift step size:** specifies the default size of the increase or decrease of the selected T and / or C levels.
	Shift mode: specifies whether the default will be to shift levels by an absolute amount, or by a percentage of the dynamic range for each channel.
	Tilt value: specifies the default value by which the selected levels will be adjusted when rotated left or right around a central channel.
	Tilt profile type: specifies whether the tilt will be linear or non-linear by default.
Stimulations	**Number of stimulations:** specifies the number of beeps played to the patient.
	Stimulation duration (ms): specifies the length of time that each beep lasts.
	Inter-stimulus duration (ms): specifies the length of time between each beep.
	Auto-stimulate: enables auto stimulation when setting T and C levels.
MAP Display	**Show parent MAP levels:** when creating a new MAP based on a saved MAP, markers display in the Channel Grid indicating the original T and C levels.
	Show levels as tooltip hint: when the cursor is placed over a channel in the Channel Grid, the T and C level values display as a tooltip.
	Show levels on channel marker labels: the T and C level values of each selected channel display in the Channel Grid.

Data Grid Advanced Properties	The selected options display in the Data Grid on the Set Levels screen.
Streamlined Default Channels	**Behavioural channels:** the selected channels display as measurable when using the Behavioural method.
	T-offset channels: the selected channel displays as measurable when using the NRT/objective offset method.
Finalise	
Progressive MAPs	When creating progressive MAPs, the C level profile on each additional MAP is adjusted by the specified amount.
Processor Settings Age Default	Specifies the eldest age that patients are considered as children for whether the paediatric processor settings are used by default.

Provide feedback

Use the Feedback screen to provide comments and information about Custom Sound Pro software issues to Cochlear.

Note: If you do not have an internet connection at the time when you are recording your feedback, the information can be stored as a .zip file and transferred to Cochlear via email, memory stick, or other method at another time.

Task steps:

1. Click on **Help > Provide Feedback** in the Menu bar.

   The Feedback window displays.

2. Enter your name into **From**, a brief description of the comment or issue into **Short Description**, and a detailed description into **Please provide your feedback or steps to reproduce the issue**.

3. Select **Include an anonymous patient export file** to add information about the current patient to the feedback report.

4. If you do not have an internet connection, click **Save** to save the feedback report in the **Cochlear Feedback Reports** folder on your Desktop as a zip file.

   The zip file contains:

   - A BugReport text file containing detailed information about your computer.
   - A ClinicDetails text file containing the feedback report and information about the clinic and sender.
   - A .zip file containing CustomSoundLog files (.csl) which record Custom Sound Pro software events.

5. If you have an internet connection, click **Send** to transmit the feedback report to Cochlear.

   A confirmation message appears. Close the screen.

Result:

- The feedback report is sent or saved.

Activate regional options

Some features or products are only available in Custom Sound Pro software by activating a regional option. Regional options are activated using the Research and Regional Options Manager. Option information is specified in regional options files (*.cofx).

Note:

- The **Change Research and Regional Options** menu option is greyed out and not available when a session is open.
- Before activating a regional option, you need an authorisation key for the option you want to activate.

Task steps:

1. Click on **Tools > Change Research and Regional Options** in the Menu bar.

   The Research and Regional Options Manager wizard displays.
2. Click the **Activate options** option button.
3. Click **Next**.
4. Click **Browse** and select the relevant regional options file (*.cofx).
5. Click **Open**.
6. Type the authorization key for the option.
7. Click **Next**.
8. Read the conditions and select the **I Accept** check box.
9. Click **Activate Options**.
10. Click **Close** to close the Research and Regional Options Manager.

Result:

- The selected regional option is activated.

Deactivate regional options

Some features or products are only available in Custom Sound Pro software by activating a regional option. Once activated, these options can also be deactivated using the Research and Regional Options Manager.

Note:

- The **Change Research and Regional Options** menu option is greyed out and not available when a session is open.
- Before deactivating a regional option, bear in mind that you need an authorization key to reactivate it again.

Task steps:

1. Click on **Tools > Change Research and Regional Options** in the Menu bar.

   The Research and Regional Options Manager wizard displays.
2. Click the **Deactivate options** option button.
3. Click **Next**.
4. Select the check box for the option you want to deactivate.
5. Click **Deactivate Options**.

   A success message displays.

   Note: Custom Sound Pro software must be re-started before the deactivation takes effect
6. Click **Close** to close the Research and Regional Options Manager.

Result:

- The selected regional option is deactivated.

Reference topics

- Cochlear Database Manager
- MAPs
- Adjust Manufacturer's Settings
- Programming
- Sound processors, devices, and accessories
- Keyboard shortcuts
- Status bar
- Set Levels toolbar
- Report Viewer
- Device performance changes
- Summary of safety and clinical performance
- Serious incidents
- Table of symbols
- Legal statement

Cochlear Database Manager

A database is automatically created, or the application is configured to connect to a network database when Custom Sound is first installed. The database is shared across Custom Sound Pro software and Custom Sound EP software and contains the records for all patients created in either application. The Cochlear Database Manager allows you to manage databases and to select the database you want to connect to.

The Cochlear Database Manager contains the following tabs:

- **Connections:** displays the list of connections to existing databases. When you log on to Custom Sound Pro software or Custom Sound EP software, the software connects to the database specified by the current connection. The connection that is currently in use is indicated by a **Check** symbol .
- **Databases:** displays the list of existing databases. The Databases tab allows you to connect to the database server, create new databases and manage existing databases.

Create or edit a connection

The Cochlear Database Manager allows you to create a new connection to an existing database, and to edit or delete existing connections.

Task steps:

1. Navigate to the Windows **Start** menu.
2. Open the Cochlear Database Manager from the Windows Start menu.
3. Click **Add** in the **Connections** tab.

   The Add Connection window displays. Mandatory boxes are indicated by a **Required** symbol .
4. Type a name for the connection in the **Connection Name** box.
5. Type the name of the server on which the database resides in the **Server\Instance Name** box.
6. If a password is required to log on to the database server, select the **Use a Specific Username and Password** option button and type the username and password in the appropriate boxes.

   Otherwise, retain the **Use Windows Integrated Security** option button.
7. Select the database you wish to connect to from the **Database** drop-down list.
8. To adjust the amount of time that Custom Sound Pro software or Custom Sound EP software will wait for a response from the database server, type the number of seconds in the **Connection Timeout** box.
9. Click **OK**.
10. To select the new connection as the default, right-click on the connection and select **Set as Active Connection**.

    The connection is marked with a **Check** symbol .

Result:

- The connection is added to the Connections list.

To edit a connection, right-click on the connection and select **Edit Connection**. Edit the existing details as required, and click **OK**.

To delete a connection, right-click on the connection, select **Delete Connection** and click **Yes** to confirm the deletion. Deleting a connection does not delete the database it connects to.

Connect to a server

In order to create or manage databases, you must first connect to the server on which the databases reside.

Task steps:

1. Navigate to the Windows **Start** menu.
2. Open the Cochlear Database Manager from the Cochlear folder, under the Windows Start menu.
3. Click the **Databases** tab in the Cochlear Database Manager.
4. Click **Connect**.

   The Connect window displays.
5. Type the name of the server on which the databases reside in the **Server\Instance Name** box, or retain the default setting.
6. Retain the **Use Windows Integrated Security** option button.

   Alternatively, select the **Use a Specific Username and Password** option button and type the username and password for the database server in the appropriate boxes.
7. Click **OK** to save the changes and close the Connect window.

   The databases that exist on the server display in the Database list.

Result:

- Cochlear Database Manager is now connected to the server.

Once the connection to the server has been established, the Cochlear Database Manager allows you to:

- Create a new database
- Upgrade a database
- Back up or restore a database
- Delete a database

Create a database

The Cochlear Database Manager allows you to create a new database as desired. By default, a connection to the new database is automatically created, but is not selected as the default connection.

Task steps:

1. Navigate to the Windows **Start** menu.
2. Open the Cochlear Database Manager from the Cochlear folder, under the Windows Start menu.
3. Click **Create** in the **Databases** tab.

   The Create Database window displays.
4. Type a name for the database in the **Database** box.
5. Type the clinic and clinician names in the appropriate boxes.

   The clinician name is used to automatically create a clinician with clinic administrator rights in Custom Sound Pro software.
6. Type a name for the connection in the **Connection Name** box.
7. Retain the **Use Windows Integrated Security** option button.

   Alternatively, select the **Use a Specific Username and Password** option button and type the username and password for the database server in the appropriate boxes.
8. Click **Create**.

   The database displays in the Database list, and a connection is created in the **Connections** tab.

Result:

- The new database is created.

If you do not wish to automatically create a new connection when the database is created, clear the **Create a New Connection for This Database** check box.

Upgrade a database

An existing database may need to be upgraded when a new version of the Custom Sound Pro software is released. By default, the Cochlear™ Database Manager backs up the existing database prior to performing the upgrade.

Task steps:

1. Navigate to the Windows **Start** menu.
2. Open the Cochlear Database Manager from the Cochlear folder, under the Windows Start menu.
3. Select the database in the Database list.
4. Click **Upgrade**.
5. Type a file location and filename for the backup file, or retain the default file path.
6. Click **Upgrade**.

Result:

- The database is upgraded.

If you do not wish to back up the database prior to upgrading, clear the **Backup the Database Before Upgrading** check box.

Note: When you upgrade the Custom Sound Pro software from 2.0 or later, the installer provides the option to upgrade the database. When the upgrade option in the installer is selected, the Custom Sound Pro software database that is currently in use is upgraded. Any additional databases or databases created using an earlier version of the software can be upgraded using the Cochlear Database Manager.

Back up or restore a database

The Cochlear Database Manager allows you to back up a database to an external file. A database can be restored from a previous backup if required.

To back up a database:

Task steps:

1. Navigate to the Windows **Start** menu.
2. Open the Cochlear Database Manager from the Cochlear folder, under the Windows Start menu.
3. Select the database in the Database list.
4. Click **Backup**.

   Alternatively, right-click on the database and click **Backup**.
5. Type a file location and filename for the backup file, or retain the default file path.
6. Click **Backup**.

Result:

- A backup of the database is saved to the specified location.

To restore a database:

Task steps:

1. Click **Restore** in the **Databases** tab.
2. Type a new name for the database in the **Database** box.
3. Type the file path of the file you wish to restore in the **Backup File** box.

   Alternatively, click **Browse**, navigate to the desired file, and click **OK**.
4. Click **Restore**.

Result:

- The restored database displays in the Database list.

Delete a database

Databases that are no longer required can be deleted from the Database list. A deleted database cannot be restored. A database can only be restored from a backup file, and it is recommended you back up the database prior to deletion.

Task steps:

1. Navigate to the Windows **Start** menu.
2. Open the Cochlear Database Manager from the Cochlear folder, under the Windows Start menu.
3. Select the database you wish to delete in the Database list.
4. Click **Delete**.

   Alternatively, right-click on the database and select **Delete Database**.
5. Click **Yes** to confirm the deletion.

Result:

- The selected database is no longer available.

MAPs

A MAP is a program that improves a cochlear implant patient's hearing experience by modifying the behaviour of the sound processor, which controls the electrical pulses sent to the cochlear implant's electrodes.

Determine compatibility of MAPs

The message box on the Set Levels screen may display messages regarding the compatibility of the MAP to other Cochlear software (Remote Assistant Fitting).

The notification box on the Finalise screen may display messages regarding the compatibility of the MAP with MVBT programming with Remote Assistant Fitting.

For the MAP to be modified by the patient using Remote Assistant Fitting, it must be within compliance levels. If the MAP is not compatible with other Cochlear software, updates can only be made using Custom Sound Pro software.

Estimating compliance levels indicates where the MAP is not compatible with other Cochlear software. If modifications are made to the MAP using Remote Assistant Fitting, adjust the MAP parameters to allow compatibility.

Adjust manufacturer's settings

Manufacturer's settings are applied by default when a MAP is created.

Note: These settings contain manufacturer's defaults and should only require adjustment in rare clinical cases.

Task steps:

1. Display the Acoustic, Global Adjustments, Comfort, Thresholds, or Set Levels screen.
2. Click on **MAP > Manufacturer's Settings** (**L** or **R**) in the Menu bar.

   The Manufacturer's Settings window displays.
3. Adjust the desired boxes.

   Note: You will need to take your patient off air to adjust some of the manufacturer's settings.

   Note: If you make a change to a parameter that automatically alters the value of another parameter, a notification will appear.
   For example: "The following parameters are altered by changing C-SPL (dB) • Loudness Growth".
4. Click **Close** to save the changes and close the Manufacturer's Settings window.

Result:

- The manufacturer's settings are adjusted.

The following parameters are available in the Manufacturer's Settings window based on the type of sound processor:

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series, CP800 Series, Freedom Hybrid and Freedom Sound Processors

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE, CP1000 - Nucleus 7, CP900 Series, CP800 Series, Freedom Hybrid and Freedom Sound Processors	
Frequency Table:	The frequency table defines the frequency range (or bandwidth) that is assigned to each active channel in the MAP. A given channel receives stimulation when its bandwidth has sufficient energy in it to be selected as a maxima. The frequency table depends upon the sound coding strategy and the number of channels in the MAP.
T-SPL (dB):	Specifies the SPL for a speech signal at which T level stimulation starts (excluding CP802 sound processors).
C-SPL (dB):	Specifies the SPL for a speech signal at which C level stimulation starts (excluding CP802 sound processors).
Loudness Growth:	(previously known as Q-value) Controls the steepness of the loudness growth function.
Volume Adjustment (%DR)	Specifies the maximum percentage of the dynamic range by which C levels can be adjusted when modifying the volume level.
Jitter	Specifies the percentage by which the stimulation rate will be varied in a positive or negative direction for SPEAK MAPs (250 Hz) only.

Programming

- Acoustic component
- Legacy programming methods

Acoustic component

Hybrid patients use acoustic stimulation (sound processor and acoustic component) and electric stimulation (sound processor and cochlear implant) to access the entire sound spectrum.

When creating a MAP for a Freedom Hybrid sound processor, a CP900 Series, CP1000 - Nucleus 7, CP1001 - Nucleus 7 SE, CP1002 - Nucleus 7 S or CP1110 - Nucleus 8 Sound Processor (when the acoustic component is required), the acoustic component needs to be programmed in addition to the electric component. Custom Sound Pro software automatically creates a MAP where low frequency information is presented via acoustic stimulation only and high frequency information is presented via modified frequency-to-electrode allocation tables. The boundary of where acoustic stimulation stops and electric stimulation begins is determined by the limit of patient's residual hearing.

Custom Sound Pro software provides three prescriptive methods which specify the target gain and maximum output level for each frequency band of amplification, and can be used as a baseline for programming the acoustic component:

- NAL-RP (National Acoustic Laboratories-Revised, Profound)
- DSL (Desired Sensation Levels)

A choice of two fitting procedures can be used with the prescriptive methods:

- **WDRC (Wide Dynamic Range Compression):** designed to amplify low-level input signals more than high-level input signals to provide audibility, while ensuring comfortable volume levels at all times. WDRC may be suitable for patients with loudness tolerance or loudness recruitment issues. WDRC is the default setting for NAL.
- **Linear:** provides the same amount of amplification (gain) to all input sound levels until the maximum power output is achieved. Linear gain may be suitable for patients who do not like to hear too much background noise in quiet, or when the gain for soft sounds increases the potential for feedback (particularly combined with large vents).

Legacy programming methods

At activation the primary goal is comfortable audibility; further fine tuning such as loudness balancing, or the perception of soft sounds can take place at a later time when the patient is more familiar with electric hearing.

With audibility achieved, early focus is placed on the optimisation of hearing outcomes and rehabilitation to support the patient's hearing goals.

The guided workflows within the software support this methodology. The Set Levels screen can still be used for the streamlined or legacy programming methods. The streamlined programming methods are:

-  **Behavioural method:** T levels are measured on selected channels using psychophysics and C levels are measured simultaneously using live voice testing. This method is appropriate for patients who can make reliable behavioural responses to sound.
-  **NRT/objective offset method:** the T level profile is offset from the objective measurement profile and a single offset channel is measured using psychophysics. C levels are measured using live voice testing. This method is appropriate for patients who may give limited behavioural responses.

In addition to the streamlined programming methods, individual channels can be measured as required.

Note: To pause or stop at any time while setting T and C levels, click the **Stop All Stimulations** button  on the Programming toolbar.

Notes:

- Streamlined programming is only available for MAPs created using Monopolar stimulation modes.
- Streamlined programming is not available for ABI541, Nucleus 24 ABI and Nucleus 22 implant types.

Sound processors, devices and accessories

- Link bilateral sound processors for smartphone use
- Smartphone-compatible hearing devices

Link bilateral sound processors for smartphone use

For bilateral patients with CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processors for each implant side, the sound processors are linked together which means they can be paired simultaneously with certain smartphones:

- iPhone, iPad or iPod touch (iOS devices) (excluding CP1002 - Nucleus 7 S Sound Processors)
- Compatible smartphones with Android with the Nucleus Smart App installed

In most cases, the sound processors for bilateral patients are linked automatically when you write the MAPs to the sound processors. In some cases after you write to the sound processor you are prompted to rewrite to the other sound processor, for example, a patient with an existing CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processor who is implanted on their other side and receives another CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processor.

When a patient pairs their linked sound processors to their device, the sound processors are recognised as a set. This means any adjustments made using the Nucleus Smart App or the iOS device hearing aid controls are made to both sound processors. For example, patients can increase the volume for both sound processors in a single operation. Alternatively, patients can adjust their linked sound processors individually, if preferred. If the programs that are written to the sound processors are different, for example, a different number of programs, or programs written to different slots, the patient can only adjust their sound processors individually.

Smartphone-compatible hearing devices

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors can be used with an iPhone® or smartphones with Android™.

Made for iPhone hearing devices

Made for iPhone hearing devices are sound processors or hearing aids that can be paired with an iPhone®, iPad® and iPod touch® (iOS devices). When paired with an iOS device, Made for iPhone hearing devices can be adjusted using the hearing aid controls on the iOS device, for example, increase the volume and change the program. Patients can also stream audio from their iOS device directly to their paired hearing device. CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors are Made for iPhone hearing devices.

Patients with CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processors can also adjust their sound processor, for example, change the program, using the Nucleus Smart App. The Nucleus Smart App is an alternative to using a remote control to adjust a sound processor.

Smartphones with Android

Patients can use the Nucleus Smart App for smartphones with Android to adjust their CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE or CP1000 - Nucleus 7 Sound Processors, for example, change the program, and view details of the sound processor such as battery status. The Nucleus Smart App is an alternative to using a remote control to adjust a sound processor.

CP1110 - Nucleus 8, CP1150 - Kanso 2, CP1002 - Nucleus 7 S, CP1001 - Nucleus 7 SE and CP1000 - Nucleus 7 Sound Processors support streaming audio directly from compatible Android handsets without the need for a phone clip or other accessory.

Keyboard shortcuts

Keyboard shortcuts provide you with a quick way of accessing Custom Sound Pro software functions. Some are generally available, while others apply only to the Set Levels screen.

Shortcuts

	Shortcut	Action
Stimulation		
	ESC	Stop stimulation
Online Help		
	F1	Access the Help file
Sound processor		
	F3	Connect / disconnect a sound processor.
Patient		
	F4	Enable talk over mode
	F5	Go Live
Tools		
	F6	Enable / disable Programming Pod communication
	F9	Access the Preferences window
MAPs		
	Ctrl + Z	Undo.
	Ctrl + Y	Redo.
	Ctrl + S	Save the currently selected MAP
	Shift + Ctrl + S	Save all open MAPs
	Ctrl + F4	Close the currently selected MAP
	Shift + Ctrl + F4	Close all open MAPs
	Ctrl + M	Open MAP Title and Notes
Channels		
	← / Ctrl + ←	Moves to next left measurable channel if an individual channel is selected. Moves to next left band if a band is selected.
	→ / Ctrl + →	Moves to next right measurable channel if an individual channel is selected. Moves to next right band if band is selected.

Global Adjustments		
	T	Switch to T mode (all keyboard actions will be performed on T levels).
	C	Switch to C mode (all keyboard actions will be performed on C levels).
	B	Switch to T & C mode (all keyboard actions will be performed on both T & C levels).
Thresholds		
	G *n*	Produce *n* stimuli on the focused channel.
	S *n* Enter	Set the number of stimuli to *n.*
Global Adjustments, Comfort, and Thresholds		
	U	In Global or Comfort, moves focus to the **Step size** box. In Thresholds, moves focus to the **Up Step** box.
	D	In Global or Comfort, moves focus to the **Step size** box. In Thresholds, moves focus to the **Down Step** box.
	↑ / Ctrl + ↑	Increase the T and / or C level or objective measurement level by the up step size.
	↓ / Ctrl + ↓	Decrease the T and / or C level or objective measurement level by the down step size.
	J	Produce the set number of beeps at T or C level on the focused channel in Comfort or Thresholds.
	Z	Toggle between automatic stimulation on and off.
	Tab	Cycles through selectors. In Global: Master Volume, Bass, Treble. In Comfort: Band A to Band H. In Thresholds: Very High to Very Low.
Sweep levels		
	R	Sweep right (ascending frequency)
	L	Sweep left (descending frequency)

Set Levels screen shortcuts

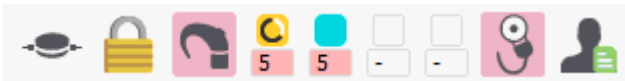
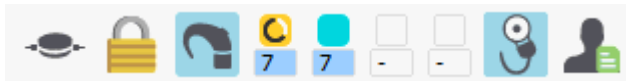
	Shortcut	Action
Select channels in the Channel Grid		
	←	Move the channel focus to the next left measurable channel.
	→	Move the channel focus to the next right measurable channel.
	Ctrl + ←	Move the channel focus to the next left channel.
	Ctrl + →	Move the channel focus to the next right channel.
	V	Toggle between select and deselect a channel.
	X	Toggle between activate and deactivate a channel.
	I	Toggle between measure and interpolate a channel.
	Ctrl + D	Toggle between double and unlink a channel.
Select mode for measuring T, C and objective measurement levels		
	T	Switch to T mode (all keyboard actions will be performed on T levels).
	C	Switch to C mode (all keyboard actions will be performed on C levels).
	O	Switch to O mode (all keyboard actions will be performed on objective measurement levels).
	B	Switch to T & C mode (all keyboard actions will be performed on both T and C levels).
	M	Toggle between T, C and T & C modes.
Measure T, C and objective measurement levels (depending on selected mode)		
	n Enter	Set the T and / or C level to *n.*
	U *n* Enter	Set the up step size to *n.*
	D *n* Enter	Set the down step size to *n.*
	↑	Increase the T and / or C level or objective measurement level by the up step size.
	↓	Decrease the T and / or C level or objective measurement level by the down step size.
	Page Up n	Increase the T and / or C level by *n.*
	Page Down n	Decrease the T and / or C level by *n.*
	Z	Toggle between automatic stimulation on and off.
	S *n* Enter	Set the number of stimuli to *n.*

	F2	Produce one stimulus at T or C level on the focused channel.
	G *n*	Produce *n* stimuli at T or C level on the focused channel.
	J	Produce the set number of stimuli at T or C level on the focused channel.
Sweep levels (depending on selected mode)		
	R	Sweep right (ascending frequency) for the set number of channels.
	Ctrl + R *n* Enter	Sweep right (ascending frequency) for *n* channels.
	L	Sweep left (descending frequency) for the set number of channels.
	Ctrl + L *n* Enter	Sweep left (descending frequency) for *n* channels.
	N *n* Enter	Set the number of channels to be stimulated to *n.*
	N S Enter	Set the number of channels to be stimulated to selected.
	N A Enter	Set the number of channels to be stimulated to all.
	P *n* Enter	Set the percentage of the dynamic range to *n.*
Shift levels (depending on selected mode)		
	Ctrl + ↑	Increase global T and / or C levels.
	Ctrl + ↓	Decrease global T and / or C levels.
	↑	Increase global C levels in live.
	↓	Decrease global C levels in live.
	H P Enter	Set the shift mode to percentage of the dynamic range.
	H C Enter	Set the shift mode to current level.
	A A Enter	Set the channel selection to all.
	A S Enter	Set the channel selection to selected.
	Q *n* Enter	Set the shift step size to *n.*
Tilt levels (depending on selected mode)		
	[	Left tilt global T and / or C levels.
	]	Right tilt global T and / or C levels.
	F *n* Enter	Set the tilt value to *n.*

Use the Data Grid		
	Shift + ↑ / Shift + ↓	Move up / down one row in the Data Grid.
	Shift + ← / Shift + →	Move left / right one column in the Data Grid.
	↑ / ↓	Select a value from the drop-down list in the selected cell (Active Electrode, Stimulation Mode / Indifferent Electrode, Gain and Pulse Width fields only).

Status bar

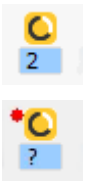
The status bar provides information on the current status of the patient, the connected sound processor and programming interface, and the implant. The status bar is colour coded to differentiate between right ear (red) and left ear (blue) implants and sound processors.

Right side	Left side
	

The following icons may display on the status bar:

	Tooltip or message	Status
Auto stimulate status		
	Auto stimulate	Automatic stimulation is currently enabled when setting T and C levels.
Programming interface status		
	(*Programming interface, com #*)	The specified programming interface is connected.
	(*Wireless Programming Pod, com #*)	Fully charged.
		Not fully charged.
		Low on charge. Please recharge or replace the battery.
		No charge. Please recharge or replace the battery.
		Battery state is unknown.
	(*Remote assistant type*)	The specified remote assistant is connected. The right-click menu allows you to: • Upgrade the software for the remote assistant. • Export the patient's AutoNRT and impedance data.
	Updating device software	The remote assistant software is being updated.

	Tooltip or message	Status
Sound processor status		
	(*Sound processor type, serial number*)	The specified sound processor is connected. The right-click menu allows you to connect or reset a sound processor. **Note:** The sound processor icon varies according to the sound processor that is connected.
	(*Sound processor type, serial number*)	The specified sound processor is using a Nucleus 22 coil, and is configured for Nucleus 22 use only. **Note:** The sound processor icon varies according to the sound processor that is connected.
	No processor connected	No sound processor is connected.
	Writing...	Programs are being written to the connected sound processor.
		Compliance levels are being estimated for the connected sound processor.
		A reset of the sound processor is required.
	Getting battery suitability...	Battery suitability is being checked for the connected sound processor.
	Battery Health	The battery for the CP1150 - Kanso 2 Sound Processor cannot be charged and needs to be replaced.
	Implant ID enabled for MAPs on this processor	Implant ID is enabled for the connected sound processor.

	Tooltip or message	Status
Program status		
	(*MAP title, environment, volume and sensitivity settings*)	The programming slot on the connected sound processor contains the specified program. The right-click menu allows you to open the MAP, go live with the program, or erase the program from the programming slot. A red dot displayed on the icon indicates the presence of MAPs that have been modified using Remote Assistant Fitting.
		The programming slot on the connected sound processor is empty.
	Corrupt MAP in slot	The MAP in the programming slot is corrupt.
		The MAP in the programming slot is not in the database.
		The specified program is currently in live mode.
Implant status (excluding Nucleus 22 implants)		
	Implant detected	Communication with the implant has been established.
	No communication with implant	Communication with the implant cannot be established. This may indicate the coil has come off the patient's implant or cables are disconnected or faulty.
	Incorrect implant type detected	The selected sound processor belongs to a different implant type.
	Telemetry being affected by other processors	Telemetry is being affected by another sound processor in too close proximity. For bilateral patients, the sound processor for the contralateral ear may need to be switched off.
	Could not read implant ID. Please remove coil from implant, wait 5 seconds then reconnect coil.	The implant ID could not be read during the implant ID check.

	Tooltip or message	Status
Patient status		
	Patient (*name surname*) is not currently open	The patient of the connected sound processor is in the database. Click to start a programming session.
	Patient of this processor is unknown. Click to register	The patient of the connected sound processor is not in the database. The Unknown Patient prompt displays automatically and allows you to register the patient or reset the sound processor. If a session is currently open, you can also associate the programs on the sound processor with the open patient.
	Patient (*name surname*)	The patient of the connected sound processor is in the database, and a programming session is open.
	Patient (*name surname*) is not currently open	The patient of the connected sound processor differs to the currently open programming session. Click to start a programming session for the connected patient.
	Patient (*name surname*) is archived	The patient of the connected sound processor is archived in the database. Click to make the patient active.

Set Levels toolbar

The Set Levels toolbar is available on the Set Levels screen only.

Set Levels toolbar		
	Save MAP	Save the currently selected MAP.
	MAP Parameters	Access the MAP Parameters window to set MAP parameters.
	Acoustic	Access the Acoustic window to prescribe acoustic levels (Freedom Hybrid and CP900 Series, CP1000 - Nucleus 7, CP1001 - Nucleus 7 SE, CP1002 - Nucleus 7 S and CP1110 - Nucleus 8 Sound Processors only).
	Undo	Undo the previous action, up to a maximum of 20 actions. Previous actions can be selected from the drop-down list.
	Redo	Redo the previous action, up to a maximum of 20 actions. Previous actions can be selected from the drop-down list.
	Go Live	Measure T and C levels using live voice testing.
	Stop All Stimulations	Stop all current stimulations.
	Hug T Profile	Set C levels to follow the T level profile with a dynamic range of 2.
	Predict Levels	Predict T and C levels when creating a new MAP from an existing MAP using a different stimulation rate or pulse width.
	Make All Channels Measurable	Enable T and C levels to be measured on all channels.
	Make Only Selected Channels Measurable	Enable T and C levels to be measured on the selected channels only. The levels on the non-selected channels are automatically interpolated.
	Reverse Electrode Order	Reverse the tonotopic order of channels by changing the channel-to-electrode configuration for all channels (ABI541 and Nucleus 24 ABI implants only).
	Title/ Notes	Access the Title and Notes window to enter a title and/or Notes.
	Modify Gains	Access the Gain Shapers window to adjust high and/or low frequency gains.

	Configure Live Program Settings	Access the Live Program Settings window to adjust the volume, sensitivity and environment settings that apply when going live.
	Create Progressive MAPs	Create additional MAPs from an initial MAP, with the C levels adjusted on each progressive MAP.
	MAP Report	Access the Report viewer to print the MAP details (saved MAPs only).
	Estimate Compliance Levels	Estimate the maximum C level achievable for each channel in a MAP.
	Measure Skin Flap and Optimise Power Level	Estimate the skin flap thickness and optimise the power level for the MAP (Freedom and CP900 Series Sound Processors with Nucleus 22 implants only).
	Close MAP	Close the currently selected MAP.

Report Viewer

The Report Viewer provides a common way to view all of the reports generated throughout Custom Sound Pro software. You can use it to zoom the report view in or out, specify the page setup (size, orientation, margins, font, headers and footers), preview for printing, and to print the report.

Custom Sound Pro software reports include:

- Session Details report
- Patient Take Home report
- MAP report
- MAP upgrade/conversion report
- MAP comparison report
- Program comparison report
- Historical session and patient take home reports

Custom Sound Pro software performance changes

If the Custom Sound Pro software has unexpected performance changes, for example, closing unexpectedly, becoming non-responsive or responding slowly, Cochlear suggests that you follow recommendation below:

- Make sure the database connection is active.
- Disconnect and reconnect processor and any programming pods if there are connection issues.
- Check the computer with the Custom Sound Pro software meets the recommended system specifications.
- Use the recommended screen resolution.
- If the Custom Sound Pro software becomes unresponsive, wait for a few minutes or end the Custom Sound process via the Windows Task Manager.
- Close other applications or restart the computer to free system resources.

Please contact your Cochlear representative for further support if you continue to have problems.

Serious incidents

Whilst serious incidents in relation to medical devices are rare, it is acknowledged that incidents may happen. As an organisation, Cochlear recognises the potential for harm and will respond to any reported serious incident.

What is a serious incident?

A ‘serious incident’ means any event that directly or indirectly has caused or could have caused an unexpected or unwanted event including any of the following:

- The death of a patient, user or other person,
- The temporary or permanent serious deterioration of a patient’s, user’s or other person’s state of health,
- A serious public health threat.

Reporting a serious incident

There is no definitive list of events/incidents that constitute a serious incident, however all serious incidents should be reported to:

- your local Cochlear office

  www.cochlear.com/intl/contact/global-offices

People within the European Union should also report all serious incidents to:

- your National Competent Authority

  http://ec.europa.eu/growth/sectors/medical-devices/contacts_en

People within Australia should also report all serious incidents to:

- Therapeutic Goods Administration

  https://www.tga.gov.au

Summary of safety and clinical performance

For people in the European Union, a summary of the safety and clinical performance of the Custom Sound Pro software can be found at:

https://ec.europa.eu/tools/eudamed.

Table of symbols

Symbol	Description
	Manufacturer.
	Date of manufacture.
	Authorised representative in the European Community.
 www.cochlear.com/manuals	Follow instructions for use on this website.
	Specific warnings or precautions associated with the device, which are not otherwise found on the label.
CE 0123	CE registration mark with notified body number.
MD	Medical Device.
UDI	Unique Device Identifier.

Legal statement

The statements made in this Custom Sound Pro software User Guide are believed to be true and correct as of the date of publication. However, specifications are subject to change without notice.

AU **Cochlear Ltd** (ABN 96 002 618 073)
1 University Avenue, Macquarie University, NSW 2109, Australia
Tel: +61 2 9428 6555

EC REP DE **Cochlear Deutschland GmbH & Co. KG**
Mailänder Straße 4 a, 30539 Hannover, Germany
Tel: +49 511 542 770

CH REP CH **Cochlear AG**
Peter Merian-Weg 4, 4052 Basel, Switzerland
Tel: +41 61 205 8204

US **Cochlear Americas**
10350 Park Meadows Drive, Lone Tree, CO 80124, USA
Tel: +1 (800) 523 5798

CA **Cochlear Canada Inc**
2500-120 Adelaide Street West, Toronto, ON M5H 1T1, Canada
Tel: +1 (800) 523 5798

GB **Cochlear Europe Ltd**
6 Dashwood Lang Road, Bourne Business Park, Addlestone,
Surrey KT15 2HJ, United Kingdom
Tel: +44 1932 26 3400

BE **Cochlear Benelux NV**
Schaliënhoevedreef 20 i, B-2800 Mechelen, Belgium
Tel: +32 15 79 55 11

FR **Cochlear France S.A.S.**
135 Route de Saint-Simon, 31035 Toulouse, France
Tel: +33 5 34 63 85 85 (International) or 0805 200 016 (National)

IT **Cochlear Italia S.r.l.**
Via Trattati Comunitari Europei 1957-2007 n.17,
40127 Bologna (BO), Italy
Tel: +39 051 601 53 11

SE **Cochlear Nordic AB**
Konstruktionsvägen 14, 435 33 Mölnlycke, Sweden
Tel +46 31 335 14 61

www.cochlear.com

TR **Cochlear Tıbbi Cihazlar ve Sağlık Hizmetleri Ltd. Şti.**
Küçükbakkalköy Mah, Defne Sok, Büyükhanlı Plaza No:3 Kat:3
Daire: 9-10-11-12, 34750, Ataşehir, İstanbul, Türkiye
Tel: +90 216 538 5900

HK **Cochlear (HK) Limited**
Room 1404-1406, 14/F, Leighton Centre, 77 Leighton Road,
Causeway Bay, Hong Kong
Tel: +852 2530 5773

KR **Cochlear Korea Ltd**
2nd Floor, Yongsan Centreville Asterium, 25,
Hangang-daero 30 gil, Yongsan-gu, Seoul, Korea (04386)
Tel: +82 2 533 4450

CN **Cochlear Medical Device (Beijing) Co., Ltd**
Unit 2608-2617, 26th Floor, No.9 Building, No.91 Jianguo Road,
Chaoyang District, Beijing 100022, P.R. China
Tel: +86 10 5909 7800

IN **Cochlear Medical Device Company India Pvt. Ltd.**
Ground Floor, Platina Building, Plot No C-59, G-Block,
Bandra Kurla Complex, Bandra (E), Mumbai – 400 051, India
Tel: +91 22 6112 1111

JP **株式会社日本コクレア(Nihon Cochlear Co Ltd)**
〒113-0033 東京都文京区本郷2-3-7 お茶の水元町ビル
Tel: +81 3 3817 0241

AE **Cochlear Middle East FZ-LLC**
Dubai Healthcare City, Al Razi Building 64, Block A, Ground Floor,
Offices IR1 and IR2, Dubai, United Arab Emirates
Tel: +971 4 818 4400

PA **Cochlear Latinoamérica S.A.**
International Business Park, Building 3835, Office 403,
Panama Pacifico, Panama
Tel: +507 830 6220

NZ **Cochlear NZ Limited**
Level 4, Takapuna Towers, 19-21 Como St, Takapuna,
Auckland 0622, New Zealand
Tel: + 64 9 914 1983

CE 0123

D1889124-V8 2024-08

Cochlear