Cochlear™ Nucleus® 8 Sound Processor

User Guide

CP1110

Symbols used in this document

Note: Important information or advice.

Tip: Time saving hint.

Caution: Special care to be taken to ensure safety and effectiveness. Could cause damage to equipment.

Warning: Potential safety hazards and serious adverse reactions. Could cause harm to person.

Contents

About this guide

This guide is intended for hearing implant recipients and their carers using the Cochlear™ Nucleus® 8 Sound Processor (model number: CP1110). This processor works with your implant to transfer sound to your ear, and is made up of a processing unit, earhook, coil and cable, magnet and a battery module.

You can power your processor with disposable or rechargeable batteries.

You can control your processor by pressing its button, or by using your Cochlear Remote Control or the Nucleus Smart App.

People with certain types of hearing loss can wear the sound processor in Hybrid™ mode by adding an acoustic component which sends amplified acoustic sound into the ear canal.

A number of tools and accessories are supplied with your processor.

Note

- Refer to the relevant sections for cautions and warnings relating to the use of the Nucleus 8 processing unit (Model number: CP1110), batteries and other devices.
- Please also refer to your Important Information document for essential advice that applies to Cochlear implant systems.

Nucleus 8 Sound Processor
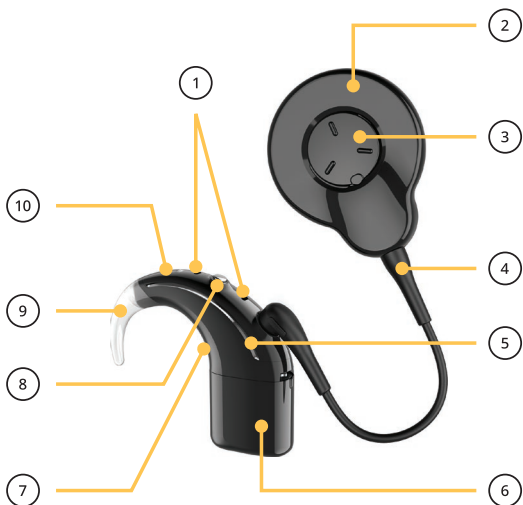
1. Microphones
2. Coil
3. Magnet
4. Coil cable
5. Processing unit
6. Battery module
7. Serial number
8. Control button
9. Earhook
10. Indicator light

⚠️ **Warning:** Sound processors and related accessories contain small parts that alone or in combination may pose a hazard of inhalation, choking or ingestion. Swallowing or inhaling small parts can cause severe or fatal injuries. Use the tamper-resistant locks to keep small parts attached to the processing unit where available, including parts that fit between the processing unit and battery module. Always supervise children under 3 years of age and others who may be at risk of inhalation, choking or ingestion of small parts when they use the sound processor and related accessories. When not in use, keep small parts, and combinations of small parts, out of reach from children. If small parts are swallowed or inhaled, seek immediate medical attention.

Power

Batteries

You have a choice of three battery types for the Nucleus 8 processing unit:

The disposable battery module consists of:

- Cochlear Battery Cover
- Cochlear Battery Holder

It uses two disposable batteries and has a tamper-resistant lock.

The Cochlear Power Extend Battery Module, rechargeable

The Cochlear Compact Battery Module, rechargeable

Battery life

Batteries should be replaced as needed just as you would with any other electronic device. Battery life varies according to the programs used each day, your implant type, the thickness of skin covering your implant, and the size and type of battery.

A completely empty rechargeable battery will typically take up to four hours to fully recharge.

To maintain good condition of your rechargeable battery and extend its lifespan, it is important to know how to charge, maintain and store your battery:

- Charge battery before storing. The optimum storage environment is a cool, dry place.
- Do not discharge battery completely before recharging.
- It is not recommended to store the battery for extended periods of time without using or charging. If you have more than one battery, rotate the batteries through usage.
- Avoid exposure to temperature extremes and humidity in storage and use, such as direct sunlight or inside a parked vehicle.

The amount of charge a battery holds naturally diminishes over time. When a battery reaches its lifespan and can no longer be charged sufficiently, the charger will indicate the need for battery replacement by a flashing orange LED indicator.

To help gain the longest life from your battery, your clinician can set your sound processor to turn off two minutes after you take it off your implant.

Lock the battery module to the processing unit

To increase tamper resistance, the battery module can be locked to the processing unit.

1. Push the lock to the far left to lock the battery module.

2. Push the lock to the far right to unlock the battery module.

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Caution: Always check this lock is unlocked before attaching or removing the battery module.

Lock the disposable battery module cover

The disposable battery module has a tamper-resistant lock to help prevent children opening the battery cover.

Lock	Turn the locking screw **clockwise** with the battery cover locking tool until it is in a **horizontal** position.
Unlock	Turn the locking screw **anticlockwise** until it is in a **vertical** position.

⚠ **Caution:** Always check the locking screw is unlocked before attaching or removing the battery cover.

Replace the battery module

Remove the battery module

1. Twist the battery module as shown to release it from the processing unit.

2. Pull the battery module from the processing unit.

⚠️ **Caution:** Always check the tamper-resistant lock is unlocked before removing the battery module (see page 8).

Attach the battery module

1. Fit the parts together with the battery module at a slight angle to the processing unit socket.

Rechargeable battery module: align raised marker and arrow on battery module towards back of processing unit

Disposable battery module: align indents and lock on battery module towards back of processing unit

2. Twist the battery module as shown to attach the parts.

Your sound processor will turn on automatically.

Note: If you do not connect the sound processor to your implant, it will turn off automatically after two minutes, if enabled by your clinician.

Change disposable batteries

The disposable battery module uses two high power zinc air batteries. Cochlear recommends 675 (PR44) zinc air batteries designed for cochlear implant use. Do not use silver oxide or alkaline batteries.

1. Press and hold the button for 5 seconds, then release to turn off your sound processor

2. Pull the unlocked battery cover away from the battery holder.

3. Remove the batteries from the battery holder.
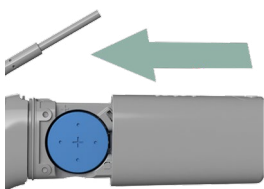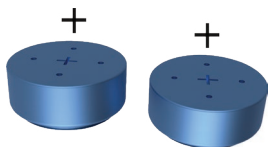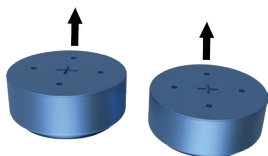
4. Remove the new batteries from the packet, and let them stand for a few seconds.

5. Insert the batteries into the battery holder with the flat side (positive terminal) facing up.

6. Replace the battery cover by sliding it up towards the processing unit.

   Lock the cover if required.

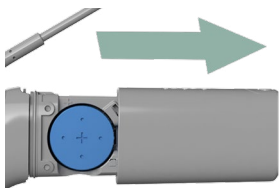   Your sound processor will automatically turn on.

Note: If you do not connect the sound processor to your implant, it will turn off automatically after two minutes, if enabled by your clinician.
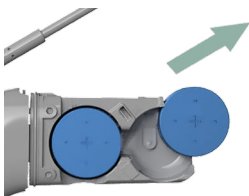
Charge rechargeable batteries

There are two chargers that can be used with the rechargeable battery modules:

Cochlear Y Battery Charger (see page 16)

Cochlear USB Battery Charger (see page 18).

Before you start

Your rechargeable battery module has built-in safety and monitoring features. Read this section before using your battery charger.

New batteries

You need to charge new batteries before first use.

What should I do?

- Before using a new battery module, you need to connect it to a charger until it is fully charged.

Charging temperature

The battery chargers have a built-in temperature sensor. Batteries must be charged at 0° C – +40° C (+32° F – +104° F). If battery module temperature is outside this range, the LED will flash orange (error).

What should I do?

- Charge rechargeable battery modules at a room temperature of 0° C – +40° C (+32° F – +104° F).

Battery health check

Rechargeable battery modules have a built-in "health check". If a charged battery detects a problem, it will turn the sound processor off. If the problem is fixed, it will turn back on again.

What should I do?

- If a battery turns off, disconnect and reconnect it to your sound processor. If this does not restore power, contact your clinician.

Completely flat batteries

After many uses or being stored too long, some batteries may be too flat to allow recharging.

What should I do?

- If a rechargeable battery module is too flat to charge, the LED will flash orange (error). Replace the battery module.

Storing batteries

Your rechargeable battery module will lose some power if you do not use it for a period of time.

What should I do?

- Charge your battery module before storing it.

Connecting to accessories

Some accessories (e.g. monitor earphone adaptor, Roger™ 20 receiver) fit between the rechargeable battery module and your processing unit.

If you leave them attached after use, this will drain the battery.

What should I do?

- Don't leave your battery module attached to an accessory after use.
- Don't attach an accessory with a rechargeable battery module attached to the battery charger.

Use the Y Battery Charger

The Y Battery Charger can charge two rechargeable battery modules at once.

It uses the **supplied USB cable** to plug into:

- A wall power outlet using **the Cochlear USB Power Adaptor**

    or

- A USB port (e.g. computer)[1]

1. USB cable
2. Rechargeable battery module connector
3. LED indicator

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[1]   USB ports must be high power USB 1.0 or higher. If you use a USB hub to connect more than one USB device to a port, we recommend you use a powered hub.

1. Fit the rechargeable battery module to the charger at a slight angle. Twist to connect.

2. Plug the USB cable into a power outlet or USB port. The LED flashes green while charging.

   Note: If you use a power outlet, plug the USB cable into the power adaptor first, then plug the adaptor into the power outlet.

3. The LED changes to steady green when the module is fully charged

Use the USB Battery Charger

The USB Battery Charger can charge one rechargeable battery module at a time.

It uses a USB connector to plug into:

- A wall power outlet using **the Cochlear USB Power Adaptor**

    or

- A USB port (e.g. computer)[2]
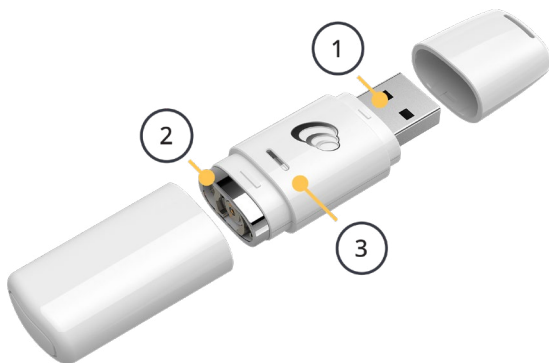
1. USB connector
2. Rechargeable battery module connector
3. LED indicator

[2]   USB ports must be high power USB 1.0 or higher. If you use a USB hub to connect more than one USB device to a port, we recommend you use a powered hub.

1. Remove the covers from the charger.
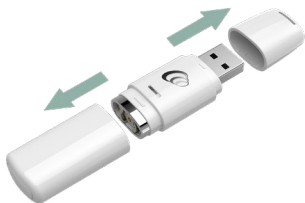
2. Fit the rechargeable battery module to the charger at a slight angle. Twist to connect.

3. Plug the charger into a power outlet or USB port. The LED flashes green while charging.

Note: If you use a power outlet, plug the USB cable into the power adaptor first, then plug the adaptor into the power outlet.

4. The LED changes to steady green when the module is fully charged.

Use

Connect the coil

Push the coil cable into the processing unit until it clicks into place.

Do not twist.

Pair with remote devices

Before using your sound processor with a compatible Apple® or Android™ device, or the Cochlear Remote Control, you need to pair your sound processor with the remote device.

Please refer to the app or remote user guides for details.

Warning: Consider security when connecting your sound processor to devices such as smartphones or tablets. Only connect to devices that are protected, e.g. password or PIN access control. Do not connect to devices that have had their operating system altered.

Android

Your Nucleus 8 Sound Processor is compatible with the ASHA (Audio Streaming for Hearing Aid) protocol. This allows you to use the audio streaming functions of compatible Android devices.

Made for iPhone

Your Nucleus 8 Sound Processor is a Made for iPhone® / iPod® / iPad® hearing device. This allows you to use the control and audio streaming functions of compatible Apple devices.

If you wear a sound processor on one ear and a compatible MFi hearing aid on the other, you may be able to simultaneously control them and stream audio using a compatible iOS device. Your clinician can check compatibility and set this up for you.

If you wear a sound processor on both ears, to reliably control your sound processors, use the Nucleus Smart App instead of the Made for iPhone Accessibility Shortcut menu on your compatible Apple device.

Note: Pairing your sound processor with your device does not enable the functionality of the Nucleus Smart App. If you want to use the app, you need to download it from Google Play or the App Store.

Nucleus Smart App

With a compatible Apple or Android device, you can use the Nucleus Smart App to control and monitor your sound processor. Please refer to your app user guide for details.

Control options

The table below compares the three ways you can control your sound processor.

Note: Some functions are only available if enabled by your clinician.

Function	Sound processor buttons	Remote control	Nucleus Smart App
Turn ON/OFF	X		
Program	X	X	X
Volume		X	X
Sensitivity		X	X
Telecoil	X	X	X
Wireless accessories	X	X	X
Master Volume Limit			X
Bass / Treble			X
ForwardFocus			X

Note: This means that Volume and Sensitivity can only be changed using the Remote Control or Nucleus Smart App.

Lock the control button

You can lock the sound processor's control button using the Nucleus Smart App.

Please refer to the app's user guide for details.

Turn on and off

1. To turn on, either:

   • Connect the battery (see page 11), or

   • If the battery is already connected, short-press the button.

2. To turn off, either:

   • Disconnect the battery (see page 10), or

   • Press and hold the button for 5 seconds. The light will change to steady orange as the sound processor turns off.

Note: Your sound processor will also turn off automatically after being off your implant for two minutes, if enabled by your clinician.

Indicator lights	What it means
Green flashes	Turning on sound processor. The number of flashes indicates the number of the current program.
Quick green flashes	Sound processor flashes while receiving sound from microphones (Child mode only).
Orange flashes	Sound processor is off the implant.
Long flash of orange	Sound processor is turning off.

Change program

You can choose between programs to change the way your sound processor deals with sound (e.g. in noisy or quiet places). Usually two programs are all you need, but your clinician can give you up to four programs.

Short-press the button to switch between programs.

Note: If your clinician has enabled SCAN 2 or SCAN 2 FF, your sound processor can automatically respond to the sound environment without you needing to change program.

Indicator lights	What it means
Green flashes	Changing the program (Child mode only). The number of flashes indicates the number of the current program.

Change volume and sensitivity

If set up by your clinician, you can control the levels of volume or sensitivity (if available) using your remote control or the Nucleus Smart App.

Please see their user guides for details.

Telecoil

Your clinician can enable telecoil if you want to listen to room hearing loops.

Note: Telecoil is optimised for room loops. For phone use we recommend the Cochlear Wireless Phone Clip (see page 27) or a compatible smartphone (see page 21).

Tip: You can also use your remote control or the Nucleus Smart App to control telecoil. See their user guides for details.

1. **Press and hold** the button for 2 seconds **then release** to turn on telecoil.

Blue: telecoil is on

2. **Short press** the button to turn off telecoil.

Wireless accessories

Cochlear True Wireless™ Accessories can wirelessly stream sound to your sound processor:

The Mini Microphone or TV Streamer are controlled from your sound processor.

You use the Phone Clip controls for phone calls.

Note: You first need to pair your wireless accessories with your sound processor. See their user guide for details.

Tip: You can also use your remote control or the Nucleus Smart App to control wireless accessories. See their user guides for details.

Each button press cycles you through telecoil (if enabled), and then your wireless accessories (in the order in which they were paired to your sound processor).

Scenario 1: Telecoil is enabled

Press	Stream audio
1	Telecoil
2	Wireless accessory 1 (e.g. Mini Microphone)
3	Wireless accessory 2 (e.g. TV Streamer)
4...	Telecoil...

Scenario 2: No telecoil

Press	Stream audio
1	Wireless accessory 1 (e.g. Mini Microphone)
2	Wireless accessory 2 (e.g. TV Streamer)
3	Wireless accessory 3 (e.g. extra Mini Microphone)
4...	Wireless accessory 1...

1. **Press and hold** the button for 2 seconds **then release** to stream audio.

   Press and release again if you need to cycle to the next audio source.

Blue: telecoil is on

2. **Short press** the button to stop streaming.

Use monitor earphones

Carers can use monitor earphones to check that a Cochlear implant recipient is receiving sound, and that functions like telecoil or wireless accessories are working.

⚠️ **Warning:** The battery module is a small part that cannot be locked to the Monitor Earphone Adaptor.

Sound processors and related accessories contain small parts that alone or in combination may pose a hazard of inhalation, choking or ingestion. Swallowing or inhaling small parts can cause severe or fatal injuries. Use the tamper-resistant locks to keep small parts attached to the processing unit where available, including parts that fit between the processing unit and battery module. Always supervise children under 3 years of age and others who may be at risk of inhalation, choking or ingestion of small parts when they use the sound processor and related accessories. When not in use, keep small parts, and combinations of small parts, out of reach from children. If small parts are swallowed or inhaled, seek immediate medical attention.

⚠️ **Caution**

- Only use Cochlear-approved earphones with the Cochlear Monitor Earphone Adaptor. You CAN use earbuds. You CANNOT use noise-cancelling headphones.
- Don't connect multiple monitor earphone adaptors in series.
- Don't connect the monitor earphone adaptor to other audio outputs, e.g. computer.

1. Twist to disconnect, then remove the battery module.

2. Insert the monitor earphone adaptor, then twist to connect.

3. Insert the battery module, then twist to connect.

4. Plug the earphones into the monitor earphone adaptor.

   ⚠ **Caution:** Use only Cochlear-approved earphones.

5. Use the earphones to check that sound can be heard.

6. Remove the earphones and adaptor as soon as you have finished monitoring.

Note

- Do not put the sound processor on the recipient's implant while using the monitor earphone adaptor, because there is no signal to the coil while it is connected.
- Remember to reconnect the battery module and lock it to your sound processor using the tamper-resistant lock.

Use Phonak's Roger™ 20

⚠️ **Warning:** Some models of Roger 20 do not allow the battery module, which is a small part, to be locked to the Roger 20. Check if there are tamper-resistant locks on both sides of your Roger 20. If there are, check that both locks are engaged and secure.

Sound processors and related accessories contain small parts that alone or in combination may pose a hazard of inhalation, choking or ingestion. Swallowing or inhaling small parts can cause severe or fatal injuries. Use the tamper-resistant locks to keep small parts attached to the processing unit where available, including parts that fit between the processing unit and battery module. Always supervise children under 3 years of age and others who may be at risk of inhalation, choking or ingestion of small parts when they use the sound processor and related accessories. When not in use, keep small parts, and combinations of small parts, out of reach from children. If small parts are swallowed or inhaled, seek immediate medical attention.

Roger 20 is not for use by children under the age of 3 years.

1. Connect the Roger 20 to your processing unit

2. Connect the battery module.

3. After use, disconnect the Roger 20.

📝 **Note:** Remember to reconnect the battery module and lock it to your processing unit using the tamper-resistant lock.

Wear

Wear your sound processor

1. Place the sound processor on your ear, letting the coil dangle.

2. Move the coil sideways and onto your implant.
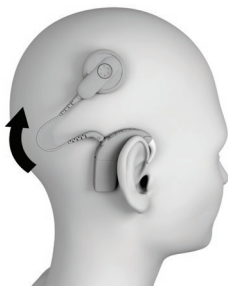
Indicator lights	What it means
● ● ● Flash of orange every second	Sound processor flashes while coil is off (or connected to the wrong implant).

People with two implants

You can ask your clinician to give you coloured stickers (red for right, blue for left) to make identifying your sound processors easier.

⚠️ **Caution:** If you have two implants, you must use the correct sound processor for each implant.

📄 **Note:** If you have newer implants, your sound processor will recognise the implant's ID and will not work on the wrong implant.

People with CI600 Series implants

If you have a CI600 Series implant, avoid sliding your coil sideways onto your implant. This could cause the coil magnet to misalign with your implant. Always place the coil down onto your implant.

To place the coil on your head:

1. Hold the coil slightly above the implant location on your head.
2. Rotate the coil slightly in both directions (clockwise and anti-clockwise).

3. When you feel a strong pull, place the coil on the implant.
4. Rotate the coil to a comfortable position for wearing.

Personalise your sound processor

You can order clear plastic Sound Processor Covers and Coil Covers to personalise your sound processor and protect it from scratches.

Attach the coil cover

To attach, discard the clear plastic protector on the cover and click the cover into place on the coil.
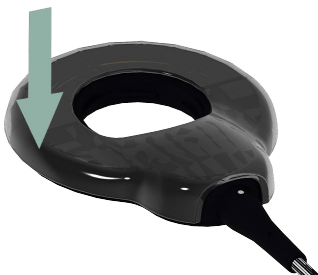
Remove the coil cover

To remove, lift the cover off the coil.
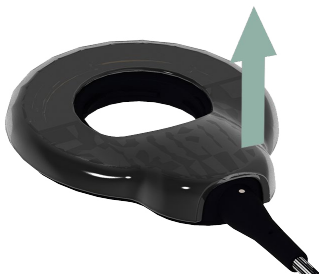
Attach the sound processor cover
To attach, slide the cover onto the sound processor.

Remove the sound processor cover
To remove, use the hole in the base to push the sound processor out.

Slide the cover off the sound processor.

Change earhooks

The Cochlear Earhook comes in small, medium and large sizes.

For extra help wearing your sound processor securely and safely, see *Retention accessories* on page 38

Note: Remove your earhook only when necessary–it may become loose if it is removed too often.

1. Pull up on the earhook to remove it.

2. Click the new earhook into place.

Retention accessories

A range of optional Cochlear accessories are available to help you wear your sound processor securely and safely.

Warning: Only use Cochlear-approved retention accessories.

Note: Hybrid mode cannot be used with retention accessories. They either position the sound processor off the ear, or use a custom earhook which means the acoustic component cannot be fitted.

Cochlear Tamper Resistant Earhook

A small earhook for young children. An extra hook holds it in place to reduce the risk of it becoming a choking hazard.

1. Remove the earhook and battery module.

2. Attach the tamper resistant earhook.

Cochlear Snugfit

Holds your sound processor more securely in place than an earhook alone. Available in small, medium and large.

1. Remove the earhook and battery module.

2. Attach Snugfit.

Cochlear Hugfit

Holds a child's sound processor in place more securely than an earhook alone. Carers can access controls and accessories. Available in five sizes to suit small ears.

1. Remove the earhook and battery module.

2. Attach Hugfit.

Warning: To avoid using a Hugfit that is too tight, it is important that clinicians and parents monitor the size of Hugfit that is used, and change to a larger Hugfit as the child grows.

Cochlear Earmould Adaptor

Allows you to attach a custom earmould if you prefer this to a normal earhook.

Note: The custom earmould is not supplied by Cochlear.

1. Remove the earhook and battery module.

2. Attach the earmould adaptor.

3. Attach the battery module and attach the earmould.

Cochlear Koala Clip

Holds your sound processor so you can clip it onto your clothing. An option for young children until they can wear their sound processor on their ear.

Note: You will need to use a coil with a longer cable.

1. Remove the coil, earhook and battery module.

2. Insert the processing unit into the Koala Clip.

3. Push down on the top of the processing unit when attaching the battery module, to ensure the metal tab on the Koala Clip fits inside the processing unit case.

Orient the sound processor so it faces the same way as when it is worn on the ear.

Note: Make sure the microphones aren't covered (e.g. by clothing).

Cochlear Headworn Adaptor

Holds your sound processor and coil, so you can wear them on your head.

Note

- Headworn adaptor comes in right or left side models — your sound processor needs to face the same way as when you wear it on your ear.
- Headworn adaptor works best with a 6, 8 or 11 cm coil cable and a compact rechargeable battery module.
- Headworn adaptor may rotate on your head. If it does, you may need to use a stronger magnet. If you already use a stronger magnet, you may not be able to use a Headworn adaptor. Contact your clinician.
- Do not forget to change to your original magnet strength when you wear your sound processor behind your ear again.
- If you experience a change in performance when using your processor with the Headworn adaptor, contact your clinician.

Warning: Increasing magnet strength may cause tightness, pain or pressure sores at the implant site. Contact your clinician.

1. Attach the body of the sound processor to the Headworn Adaptor.

2. Attach the coil to the Headworn Adaptor.

Cochlear Safety Cord

Clips to clothing so children and active adults are less likely to lose their sound processor.

Available in single or double (for users with two sound processors).

Coil Spacer

Increases the distance between the coil and the implant if you have a thin skin flap. Your clinician will fit the Coil Spacer if it is required.

Cochlear Nucleus 7 Headband

The Nucleus 7 Headband is designed to hold your sound processor(s) in place.

Measure head circumference to choose a size.

Size	Head circumference
XS	40–48 cm
S	45–53 cm

Note: The headband may affect sound processor performance. If you notice any change, contact your clinician.

Recommendation: Remove the headband at least once daily, while sleeping.

Fit the headband

To fit the headband, follow these steps.

1. Open the headband and lay it flat, with the anti-slip section facing you, elastic loops at the top and arrows pointing up.

   1 Elastic loop

   2 Anti-slip section

   3 Arrow
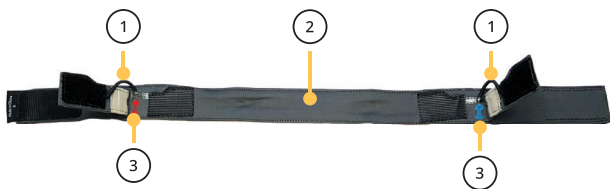
2. Locate the correct side for your processor and open the flap.

   - Right processor goes on the left-side (red arrow)
   - Left processor goes on the right-side (blue arrow).

3. Pull the coil through the elastic loop in the direction of the arrow.
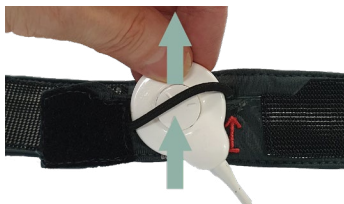
4. Pull the coil cable sideways through the elastic loop.

5. Position the processor against the flap and the elastic loop over the processor as shown:

6. Close the flap over the processor (press firmly).
7. Check that the elastic loop is positioned correctly.

8. If you have two processors, place your second processor on the other side.

9. Place the headband on your head, making sure that:
   - The anti-slip section is against your forehead.
   - Your processor is over your implant.
   - The headband fits firmly.
   - The hook and loop fastener join is secure (press firmly).

Attach a SoftWear pad

The Cochlear SoftWear pad is optional. If you experience discomfort from your coil, you can attach this adhesive pad to the head side of your coil.

1. Peel off the single backing strip on the adhesive side of the pad.

2. Attach the pad to the head side of the coil–press down firmly.

3. Peel off the two semicircle backing covers on the cushion side of the pad.

4. Wear your sound processor as usual.
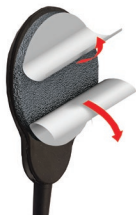
Note

- The SoftWear pad may affect your sound processor's performance. If you notice any change, contact your clinician.
- Do not use the SoftWear pad with a Cochlear Nucleus 8 Aqua+ Coil or the Cochlear Coil Spacer.

Sport and exercise

Tip: Always ensure the battery cover and battery modules are locked when you exercise or play sport.

Note: If you want to use your sound processor around water, ask your clinician about the Cochlear Aqua+.

1. Use retention accessories such as the Snugfit or Safety Cord to help hold your sound processor in place when you play sport or exercise.

2. After exercise, wipe your sound processor with a soft cloth to remove sweat or grime.

3. Then check your microphone protectors for dirt. If they are dirty, replace the microphone cover.

See *Change microphone cover* on page 60

Travel

Note: Visit www.cochlear.com/clinic-finder to find the nearest clinic in places you are travelling.

- Take a printout from your clinician of your most recent programs in case you need help with your sound processor.
- If you have a backup sound processor, check that it is programmed correctly and take it with you.
- It's okay to move through metal detectors and full body scanners with your sound processor on. To avoid any possible buzzing sounds in your ear, turn off the telecoil.
- Ask your clinician for a Patient Identification Card. In the unlikely event that your implant sets off a metal detector the ID card will help explain that you have an implanted medical device.
- If you need to remove your sound processor as you move through airport security, place it in a case in your hand luggage.
- Your sound processor transmits high frequency radio waves when switched on, and may need to be placed in a flight-safe mode during takeoff and landing. Check with airline staff before flying if you are unsure.

Flight mode

Note: In flight mode, you can change programs as normal using the sound processor button. You can only use telecoil to stream audio, as True Wireless Accessories will not be available.

To enter flight mode:

1. Disconnect the battery.

2. **Press and hold** the button (1) while reconnecting the battery (2).

   Release the button when the green light comes on

To exit flight mode:

1. Disconnect and reconnect the battery.

Care

Regular care

⚠️ **Caution**

- Do not use cleaning agents or alcohol to clean your sound processor or accessories.
- Turn your sound processor off before cleaning or performing maintenance.

Every day

- Check all parts and any accessories you use (e.g. Snugfit, SoftWear pad) for dirt or moisture. Wipe the processing unit, coil, cable, earhook and accessories with a soft dry cloth. (You can leave accessories on the processing unit while cleaning.)

- Keep your sound processor free from moisture by drying it every night in your dry aid kit.

- Remove the battery module and make sure all the contacts are clean. Carefully tap or blow on them to remove any dirt. Wipe the contacts with a soft dry cloth.

- Keep accessories clean. Blow on connectors to remove any dust and clean accessories with a soft dry cloth.

- Check the microphone protectors for signs of dirt or grime and replace if needed. See *Change microphone cover* on page 60.

Every month

- Check if earhooks or retention accessories are becoming loose or showing signs of wear. Replace as needed. See *Change earhooks* on page 37, or your retention accessory's instructions.
- Replace a SoftWear pad (if used) if it is worn or damaged, or has accumulated dirt or moisture that cannot be wiped off. If you have any problem with comfort, that is not helped by changing the SoftWear pad, contact your clinician. See *Attach a SoftWear pad* on page 49.
- If you use disposable batteries, check if the battery cover is becoming loose. If it is, replace the Cochlear Battery Holder O-ring, which is the rubber ring that can be found at the top of the battery holder.

Every two months

- Replace the dry brick in your dry aid kit.

Every three months

- Replace the microphone cover–this is very important for the quality of sound. See *Change microphone cover* on page 60.

Battery charger care

Every day

Check your battery charger is clean. If you notice any dust or dirt:

1. Disconnect the battery charger from the power source and remove any battery modules.
2. Hold the battery charger upside down and tap it gently to remove any dirt from the battery charger sockets. Carefully blowing on the sockets may also help remove dirt.
3. Wipe the battery charger sockets with a soft dry cloth.

(Y Battery Charger) Use a different charger socket each time you charge to wear the sockets evenly.

If it gets wet

If the battery charger ever gets splashed with liquid, carefully shake out the liquid and dry the battery charger for 24 hours. Do not use the battery charger until it is dry.

Headband care

Caution: Before cleaning your headband, remove the sound processor.

If the headband is dirty:

- Wash in cold water (machine or hand wash).
- Do not bleach.
- Do not tumble dry.
- Iron on medium heat.

Wash the headband as needed or at least once a week if worn continuously.

Storage

Dry aid kit

Store your sound processor at night in the dry aid kit provided by Cochlear:

- Using disposable batteries: store the sound processor fully assembled.
- Using a rechargeable battery: remove the battery module and recharge if necessary. Leave the coil attached to the processing unit and store in the dry aid kit.

Storage case

For long term storage:

- Remove disposable batteries and store so they do not touch each other.
- Remove rechargeable battery modules and store fully charged.
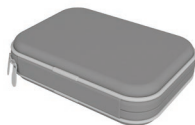
Storage cases are available from Cochlear.

Water, sand and dirt

Your sound processor is resistant to water, sand and dust. However, it is still a precision electronic device so you should take the following precautions.

If your processing unit ever gets wet, dry it with a soft cloth.

Then remove the battery module (and disposable batteries if used), dry them and the contacts with a soft cloth, and replace them.

Remove the microphone cover and place your processing unit in the dry aid kit provided by Cochlear for 8 hours.

See *Batteries* on page 6

See *Change microphone cover* on page 60

If sand or dirt ever enters the processing unit, shake the components carefully to remove it.

Your processing unit is protected against failure from dust and immersion in water at depths of up to 1 metre (IP68 rated) when you wear it with:

- A rechargeable battery module
- A coil
- No acoustic component.

If you use a disposable battery module instead of a rechargeable battery module, or use the processing unit with an acoustic component worn in the ear, it is protected against failure from dust and splashing water (IP54 rated).

Change microphone cover

Replace your microphone protectors every three months, or if they look dirty or you notice any loss in sound quality. They are built into the Cochlear Microphone Cover, which is completely replaced.

1. Microphone protectors
2. Microphone cover

Step 1: Remove old microphone cover

1. Hold the coil cable grip and firmly **pull it straight out** of the processing unit. Do not tug on the flexible part of the coil cable.

   ⚠ **Caution:** Do not twist the coil cable when you pull it out of the processing unit.

2. Lift the microphone cover from the bottom edge, then lift it up to remove.

Step 2: Insert new microphone cover

1. Fit the replacement microphone cover onto the processing unit.

2. Press down firmly with a finger on each end and the middle of the microphone cover until you feel a click.

3. Push your coil cable into the processing until it clicks.
Do not twist.

Change the coil

The Cochlear Slimline™ Coil comes in four cable lengths (6, 8, 11 and 25 cm) so you can choose the most comfortable fit.

You might also need to change to a different cable length to use some retention accessories (e.g. Koala Clip).

Note: Only remove the coil from your processing unit when necessary.

1. Hold the coil cable grip and firmly **pull it straight out** of the processing unit. Do not pull on the flexible part of the coil cable.

   Caution: Do not twist the coil cable when you pull it out of the processing unit.

2. Push the new coil cable into the processing unit until it clicks into place. **Do not twist.**

Change the coil magnet

You need to choose a Cochlear Magnet that is the correct strength–if it is too weak the coil may fall off, and if it is too strong it may cause discomfort.

Magnet strengths range from ½ (weakest) to 6 (strongest) for standard magnets and 1/2(I) (weakest) to 4(I) (strongest) for '(I)' magnets.

You might also need to change to a stronger magnet to use some retention accessories (e.g. Headworn adaptor).

Note: If your clinician has provided you with a Cochlear Magnet Reverse Polarity, use it as described here for a normal magnet.

1. With finger grips facing up, unscrew the magnet anticlockwise.

2. Remove the magnet.

3. Insert the new magnet and turn clockwise until it stops.

4. Turn the magnet a little more until you feel a click.
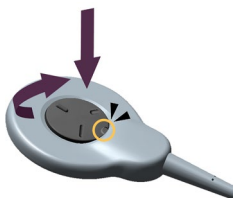
   Tip: The tamper-resistant lock marker aligns with the cable when locked.

Lights and beeps

Lights

Your clinician can set up your sound processor to show some or all of the following light indications.

Turning on and off

Light	What it means
●●●●● ... Quick green flashes	Sound processor flashes while receiving sound from microphones (Child mode only).
● ●● ●●● ●●●● Quick green flashes	Turning on and changing programs. Number of flashes indicates the number of the current program.
▬▬▬▬ Long flash of orange	Turning off sound processor.

Locking button

Light	What it means
🟢🟠 Green flash followed by orange	Locking sound processor button.
🟠🟢 Orange flash followed by green	Unlocking sound processor button.
🟠 Orange flash when pressing button	Sound processor button is locked.

Streaming audio

Light	What it means
🔵 🔵 🔵 Flashes blue for 4 seconds	Sound processor flashes when pairing to wireless accessory is successful.
🔵🔵🔵🔵🔵 ... Quick blue flashes	Sound processor flashes while receiving audio from an audio source (Child mode only).

ForwardFocus *

Light	What it means
● Quick green flash	Turning ForwardFocus on/off (Child mode only).

* If available, Nucleus Smart App only

Alerts

Light	What it means
● ● ●… Flash of orange every second	Sound processor flashes while it is off your head (or connected to the wrong implant).
●●●●● Orange flashes	Sound processor batteries are low. Change batteries.
▬▬▬▬ Steady orange	Fault. Contact your clinician. Stays on until the issue is resolved.

Battery charging

Light	What it means
▬ ▭ ▬…	Battery module is charging.
▬▬▬▬	Battery module is fully charged.
▬ ▭ ▬…	Error (see *Troubleshoot* on page 70)

Beeps

Your clinician can set up your sound processor so you can hear the following beeps (they are only audible to you).

Turning on and off

Beep	What it means
● ●● ●●● ●●●● Short high beeps	Changing the program. The number of beeps indicates the number of the selected program.
● Short high beep	Changing volume or sensitivity level (if available).
● ■ Short high then short low beep	When changing volume or sensitivity, indicates upper or lower limit of volume/sensitivity reached.

Locking button

Beep	What it means
■ Short low beep when you press button	Sound processor button is locked.
● ■ Short high then short low beep	Locking sound processor button.
■ ● Short low then short high beep	Unlocking sound processor button.

Telecoil

Beep	What it means
▬▬ Long high beep	Switching between using the microphones and telecoil.

Wireless accessories

Beep	What it means
▬ ▬ ▬ ▬ ▮ 5 ascending beeps	Connecting with wireless accessory to begin streaming audio.
▮ Short low beep	When stopping streaming.

Alerts

Beep	What it means
▮ ▮ 2 Short low beeps	Sound processor batteries are low. Change batteries.
▮ ▮ ▮ ▮ ▮ ▮ ▮ ▮ ▮ ▮ Short low beeps for 4 seconds	Batteries are empty and sound processor is turning off. Change batteries.
▬ ▬ ▬ ▬ 4 long low beeps over 4 seconds	General fault. Consult your clinician.

Adjusting master volume limit, bass and treble *

Beep	What it means
▬▬▬ Loud long medium beep	Adjusting master volume limit.
⬤▬▬ Loud long high beep	Adjusting treble level.
▬▬ Loud long low beep	Adjusting bass level.

ForwardFocus *

Beep	What it means
⬤ Short high beep	Turning ForwardFocus on/off

* If available, Nucleus Smart App only

Troubleshoot

Contact your clinician if you have any concerns regarding the operation or safety of your sound processor.

Sound processor

Problem	Resolution
Sound processor will not turn on/button will not respond	1. Try turning the sound processor on again. See *Turn on and off* on page 23.
	2. Try unlocking the button. See *Lock the control button* on page 23.
	3. Change the batteries. See *Replace the battery module* on page 10 or *Charge rechargeable batteries* on page 14.
	4. If you are using a new rechargeable battery, that has not been charged it may still be in 'Sleep Mode'. See *Charge rechargeable batteries* on page 14.
	5. If you have two implants, check that you are wearing the correct sound processor on each implant.
	6. Check the battery contacts are free of dirt and dust. See *Water, sand and dirt* on page 58.
	7. If the problem continues, contact your clinician.

Problem	Resolution
The sound processor switches off	1. Ask your clinician if "Auto power off" is enabled. If it is, then the sound processor will switch off after two minutes when not connected to the implant.
	2. Change the batteries. See *Replace the battery module* on page 10 or *Charge rechargeable batteries* on page 14.
The sound processor will not turn off	1. Check the sound processor is not locked. See *Lock the control button* on page 23.
	2. Remove the battery module from the processing unit. See *Remove the battery module* on page 10.
You are not sure what sound processor beeps or light flashes mean	See *Lights and beeps* on page 64.

Problem	Resolution
You do not hear sound or sound is intermittent	1. Make sure the coil cable is fully inserted into the socket on the processing unit.
	2. Make sure you are using the correct coil magnet for your implant. If unsure, contact your clinician.
	3. If you use the Remote Control, turn up the volume.
	4. If you use the Nucleus Smart App, turn up the volume or sensitivity.
	5. Try a different program. See *Change program* on page 25.
	6. Change the batteries. See *Replace the battery module* on page 10 or *Charge rechargeable batteries* on page 14.
	7. If the problem continues, contact your clinician.
You hear intermittent sound, a buzzing sound or distorted speech	1. Check for sources of interference such as radio and TV transmission towers (within approximately 1.6 km or 1 mile), shopping centres, airport security systems and mobile phones.
	2. Try moving away from any source of magnetic or electronic interference.
	3. If the problem continues, contact your clinician.

Problem	Resolution
Sound is too loud or uncomfortable	1. If you use a Remote Control, turn down the volume.
	2. If you use the Nucleus Smart App, turn down the volume or sensitivity.
	3. Try a different program. See *Change program* on page 25.
	4. If you have two sound processors (one for each side), ensure you have them on the correct side.
	5. If the problem continues, remove the processing unit and coil from your head immediately and contact your clinician.
Sound is too quiet or muffled	1. If you use a Remote Control, turn up the volume.
	2. If you use the Nucleus Smart App, turn up the volume or sensitivity.
	3. Try a different program. See *Change program* on page 25.
	4. Try changing the microphone protectors. See *Change microphone cover* on page 60.
	5. If the problem continues, contact your clinician.

Problem	Resolution
You want to confirm your sound processor is receiving sound	1. Check the light on the top of the sound processor (if enabled). See *Lights* on page 64.
	2. If you have a monitor earphone adaptor, a hearing person can listen to the sound received by the sound processor. See *Use monitor earphones* on page 29.
	3. If you use the Nucleus Smart App, use the Status screen to check the sound processor is receiving sound
	4. If the problem continues, contact your clinician.
The sound processor or coil become hot	Remove the processing unit, coil and any cables from your head immediately, disconnect the battery module and contact your clinician.
You experience tightness, discomfort or develop a skin irritation at your implant site	1. Your coil magnet may be too strong or in contact with your skin. Change to a weaker magnet. See *Change the coil magnet* on page 63.
	2. Try using an adhesive SoftWear pad. See *Attach a SoftWear pad* on page 49.
	3. If you are using a retention aid, such as a headband, this may be placing pressure on your sound processor. Adjust your retention aid, or try a different aid.
	4. If the problem continues, contact your clinician.

Problem	Resolution
You do not hear sound from a wireless accessory	1. Testing has shown that interference from nearby electrical devices can sometimes disrupt streaming from a wireless accessory – try moving away from any device that might be causing this interference.
	2. Check that the wireless accessory is charged and turned on.
	3. Check that the wireless accessory is paired with your sound processor.
	4. Check the volume of the wireless accessory.
	5. If you use the Nucleus Smart App, use the Status screen to check the sound processor is receiving sound from the accessory.
	6. If you use the Nucleus Smart App, check and adjust the accessory/microphone volume.
	7. If available, try a different sound processor.
	8. For more troubleshooting, see the *True Wireless Accessories User Guide*.

Problem	Resolution
You do not hear sound from a monitor earphone	1. Check that the monitor earphone cable is fully inserted into the socket on the monitor earphone adaptor. 2. Check that the monitor earphone adaptor is properly connected to the sound processor and battery module. 3. If you use the Nucleus Smart App, use the Status screen to check the sound processor volume level. 4. If available, try a different sound processor.
You hear loud or distorted sound from a monitor earphone	Remove the monitor earphone and consult your clinician.
The sound processor gets wet	Dry the sound processor with a soft cloth, change the microphone protectors and place the sound processor in the dry aid kit provided by Cochlear for 8 hours. See *Water, sand and dirt* on page 58.
You want to perform a regular check on your sound processor	See *Regular care* on page 54.

Battery

Problem	Resolution
Batteries are not lasting as long as usual	1. Clean all connections and parts of the battery module. 2. Clean all connections on the processing unit. 3. Make sure you are using the correct coil magnet for your implant. If unsure, contact your clinician. 4. Try replacing the coil with a new coil. 5. If you are using disposable batteries, check that you are using the recommended batteries. See *Change disposable batteries* on page 12. 6. Don't forget to let new disposable batteries stand for a few seconds before you put them in the processing unit. 7. If the problem continues, contact your clinician.
The indicator light on the battery charger shows a fully charged battery is still charging	This won't cause any damage to the battery as the charge cycle on a fully charged battery is very short.

Problem	Resolution
The safety indicator light on the battery charger is flashing orange	1. If the indicator light flashes orange immediately, it could be due to the wrong battery type connected to the charger, or the battery has reached its end of life and needs replacing.
	2. If you are using the Y battery charger, try the rechargeable battery module on the other connector of the charger.
	3. The room temperature may be outside the operating range of the charger. Try using the charger at a room temperature of 0°C - +40°C (+32°F - +104°F). Battery charging will automatically resume once placed in the correct temperature range.
	4. Charge timeout is reached, if charging time becomes excessive after 5 hours. The battery should not attempt to be charged again. The battery should no longer be used and should be replaced.
	5. The USB port or adaptor may not be the correct type. Try another USB port or adaptor.
	6. If using a USB hub, too many devices may be connected to the hub. Try removing some devices from the hub.
	7. If using a USB hub, it may not be the correct type. Use a powered hub.
	8. Try a different or new rechargeable battery module. Aged batteries may be due for replacement if the charge can no longer be attained.

Problem	Resolution
The indicator light on the battery charger does not light	1. The rechargeable battery module is not properly connected. Check the connection.
	2. The rechargeable battery module is over-discharged.
	3. The rechargeable battery module is faulty. Try a different module.
	4. There is no power to the USB port. Check the power supply.

Cautions

- Young children who are developing motor skills are at greater risk of an impact to the head from a hard object (e.g. table or chair). Impact to the sound processor may cause damage to the processing unit or its parts. Impact to the head in the area of the Cochlear implant could damage it and result in its failure.
- Most patients can benefit from electrical stimulation levels that are considered safe, based on animal experimental data. The long-term effects of such stimulation in humans are unknown.

Warnings

For parents and carers

- Sound processors and related accessories contain small parts that alone or in combination may pose a hazard of inhalation, choking or ingestion. Swallowing or inhaling small parts can cause severe or fatal injuries. Use the tamper-resistant locks to keep small parts attached to the processing unit where available, including parts that fit between the processing unit and battery module. Always supervise children under 3 years of age and others who may be at risk of inhalation, choking or ingestion of small parts when they use the sound processor and related accessories. When not in use, keep small parts, and combinations of small parts, out of reach from children. If small parts are swallowed or inhaled, seek immediate medical attention.

- Parents and carers are advised that unsupervised use of long cables (e.g. coil, accessory cables or the headband) may present a risk of strangulation.

- Carers must routinely check the device for signs of overheating and for signs of discomfort or skin irritation at the implant site. Remove the sound processor, coil and any cables immediately if there is any discomfort or pain (e.g. if device becomes hot or sound is uncomfortably loud) and contact your clinician.

- Carers must monitor for signs of discomfort or skin irritation if a retention aid is used that applies pressure to the sound processor or coil. Remove the aid immediately if there is any discomfort or pain, and contact your clinician.
- Keep the dry brick from the dry aid kit away from small children. Swallowing this material can cause serious internal injuries.
- Do not allow children to replace batteries without adult supervision.
- Do not allow children to use a battery charger without adult supervision.

Sound processor and parts

- Each sound processor is programmed specifically for each implant. Never wear another person's sound processor or lend yours to another person.
- Use your Cochlear implant system only with Cochlear-approved devices and accessories.
- If you experience a significant change in performance, remove your sound processor and contact your clinician.
- Your sound processor and other parts of the system contain complex electronic parts. These parts are durable but must be treated with care.
- No modification of this equipment is allowed. Warranty will be void if modified.
- Remove the monitor earphones immediately if the sound level is uncomfortably loud and inform your clinician.

- If the coil magnet is too strong or is in contact with the skin, pressure sores may develop at the implant site. If this happens, or if you experience tightness or pain in this area, stop using your sound processor and contact your clinician.

- Do not apply continued pressure to the coil when in contact with the skin (e.g. sleeping while lying on coil, or using tight fitting headwear).

- Do not push the volume too high for comfort in case a loud noise occurs nearby.

- If you need to adjust the volume often, or if adjusting volume ever causes discomfort, contact your clinician.

- Do not use your sound processor in an explosive or oxygen-rich environment.

- Do not let your sound processor or parts entangle with any jewellery (e.g. earhook and earrings) or machinery.

- Do not place the sound processor or parts in any household devices (e.g. microwave oven, dryer).

- Do not expose the sound processor or parts to heat (e.g. never leave them in sunlight, behind a window or in a car).

- Do not use a dry aid kit that has an Ultra Violet C (UVC) lamp (e.g. do not use the Freedom™ Dry and Store).

- The magnetic attachment of your sound processor to your implant may be affected by other magnetic sources.

- The magnetic attachment of your sound processor to your implant may affect hearing aids.

- Your sound processor coil and magnet may be affected by metallic or magnetic objects. Keep metallic or magnetic objects away from your coil.

- Store spare coil magnets safely and away from cards that may have a magnetic strip (e.g. credit cards, bus tickets).

- Your device contains magnets that should be kept away from life supporting devices (e.g. cardiac pacemakers and ICDs (implantable cardioverter defibrillators) and magnetic ventricular shunts), as the magnets may affect the function of these devices. Keep your sound processor at least 15 cm (6 in) from such devices. Contact the manufacturer of the specific device to find out more.

- Your sound processor and remote control radiate electromagnetic energy that may interfere with life supporting devices, (e.g. cardiac pacemakers and ICDs). Keep your sound processor and remote control at least 15 cm (6 in) from such devices. Contact the manufacturer of the specific device to find out more.

- Do not place the device or accessories inside any part of your body (e.g. nose, mouth).

- Seek medical advice before entering any environment that may adversely affect the operation of your Cochlear implant, including areas protected by a warning notice preventing entry by patients fitted with a pacemaker.

- Some types of digital mobile telephones (e.g. Global System for Mobile communications (GSM) as used in some countries) may interfere with the operation of your external equipment. You may hear distorted sound when close, 1-4 m (~3-12 ft), to a digital mobile telephone in use.

- For Cochlear Nucleus cochlear implant recipients only, the maximum diving depth is 40 m (~131 ft). Seek medical advice before diving to ensure you do not have any conditions that might make diving contraindicated (e.g. middle ear infection). When wearing a mask, avoid pressure over the implant site.

- Before activities that create electrostatic discharge (e.g. playing on plastic playground equipment), remove your sound processor. In rare cases, discharge of static electricity can damage or cause your sound processor to shut down. If your sound processor shuts down, it should resume normal operation after restarting it. If static electricity is present (e.g. when putting on clothes over your head, or getting out of a car), before the Cochlear implant system touches any object or person, you should touch something conductive such as a metal door handle.

Batteries

- Use only Cochlear supplied or recommended 675 (PR44) zinc air batteries designed for cochlear implant use. We do not recommend using silver oxide or alkaline batteries.

- Insert disposable batteries in the correct orientation.

- If disposable batteries are short-circuited the sound processor will not work and its temperature can reach +42° C (+107° F). Remove the sound processor and coil immediately and contact your clinician.

- Do not mix disposable batteries that differ by manufacturer, brand, type, age or previous usage.

- Do not leave flat disposable batteries in the sound processor.
- Replace both disposable batteries at the same time.
- Dispose of used batteries promptly and carefully, in accordance with local regulations. Keep away from children.
- Do not short-circuit batteries (e.g. do not let terminals of batteries contact each other, do not place batteries loose in pockets, etc.).
- Do not disassemble, deform, immerse in water or dispose of batteries in fire.
- When sound processor is not in use, remove the batteries and store separately in a clean and dry place.
- Wipe batteries with a clean dry cloth if they become dirty.
- Store unused batteries in original packaging, in a clean and dry place.
- Do not use damaged or deformed batteries. If skin or eyes come into contact with battery fluid or liquid, wash out with water and seek medical attention immediately.

- Do not expose batteries to heat (e.g. never leave batteries in sunlight, behind a window or in a car).
- Never put batteries in your mouth. If swallowed, immediately contact your physician or local poison information service.
- Do not recharge disposable batteries.
- Only use rechargeable batteries and battery chargers supplied or recommended by Cochlear. Use of other batteries or battery chargers may result in harm or injury.
- Charge rechargeable batteries before use.
- Do not touch the battery charger contacts.

Medical treatments

Magnetic resonance imaging (MRI)

The Nucleus 8 Sound Processor, remote and related accessories (such as the Wireless Programming Pod) are MR Unsafe.

Full MRI safety information is available at www.cochlear.com/warnings or by calling your regional Cochlear office (contact numbers available at the end of this document).

Medical treatments generating induced currents, heat and vibration

Having a cochlear implant means extra care must be taken when receiving some medical treatments. Before starting medical treatment, the information in this section should be discussed with the recipient's physician.

The sound processor must be removed before starting any of the medical treatments listed in this section.

Some medical treatments generate induced currents that may cause tissue damage or permanent damage to the implant. Before initiating any of the following treatments deactivate the device.

Warnings for specific treatments are provided below.

Condition	Warning
Diathermy	Do not use therapeutic or medical diathermy (thermopenetration) using electromagnetic radiation (magnetic induction coils or microwave). High currents induced into the electrode lead can cause tissue damage to the cochlea/brainstem or permanent damage to the implant. Medical diathermy using ultrasound may be used below the head and neck.
Electroconvulsive therapy	Do not use electroconvulsive therapy on an implant patient under any circumstances. Electroconvulsive therapy can cause tissue damage or damage to the implant.

Condition	Warning
Electrosurgery	Electrosurgical instruments can induce radio frequency currents that could flow through the electrode.
	Monopolar electrosurgical instruments must not be used on the head or neck of an implant patient as induced currents could cause damage to cochlear/neural tissues or permanent damage to the implant.
	When using bipolar electrosurgical instruments on the head and neck of a patient, the cautery electrodes must not contact the implant and should be kept more than 1 cm (½ in.) from the electrodes.
Ionising radiation therapy	Do not use ionising radiation therapy directly over the implant. It may cause damage to the implant.
Neurostimulation	Do not use neurostimulation directly over the implant. High currents induced into the electrode lead can cause tissue damage to the cochlea/brainstem or permanent damage to the implant
Therapeutic ultrasound	Do not use therapeutic levels of ultrasound energy directly over the implant. It may inadvertently concentrate the ultrasound field and cause tissue damage or damage to the implant.

Other information

Physical configuration

The processing unit comprises:

- Two omni-directional microphones for receiving sound.
- An internal telecoil for receiving magnetic fields radiated by neck loops and room loops.
- Custom analogue and digital integrated circuits with digital signal processing (DSP) and bidirectional wireless communication capabilities.
- A tri-colour visual indication of sound processor function or problem.
- Control button allowing user control of key features.
- Custom 4-pin connector for coil cable.
- A range of earhooks and specialised retention options.

The batteries provide power to the processing unit. The coil acts as a transformer coupling that transfers energy and data to the implant.

Materials

- Processing unit: copolyester.
- Battery modules (all types) are made of copolyester.
- Coil is made of polypropylene (PP), thermoplastic elastomer (TPE).
- Coil magnet casing is made of acrylonitrile butadiene styrene (ABS).
- Coil cable sheath is made of polyvinyl chloride (PVC).
- Coil cable plugs are made of PP and TPE.
- Retention parts are made from polyamide (PA) and liquid silicone rubber (LSR).
- Headband parts are made of polyester, elastane, rubber, spandex and nylon.

Battery life, charge cycles and lifespan

- Battery life means the time a device will run before the disposable batteries must be replaced, or the rechargeable batteries recharged.
- Battery charge cycle is a full charge and discharge of the rechargeable battery.
- Battery lifespan means the total number of charge cycles a rechargeable battery will last before the battery life degrades to 80% of its original fully-charged capacity.

Operating characteristics

Processing unit

Characteristic	Value / range
Sound input frequency range	100 Hz to 8 kHz
Wireless technology	• Proprietary low power bidirectional wireless link (remote, wireless accessories) • Published commercial wireless protocol (Bluetooth Low Energy)
RF frequency	2.4 GHz
Max. RF output power	< 4 dBm
Operating voltage	2.00 V to 4.25 V
Power consumption	20 mW to 100 mW for CI500 Series implants and CI600 Series implants
Charge cycles	≥ 80% capacity after 400 charge/discharge cycles at room temperature
Button functions	Turn sound processor on and off, turn audio streaming on and off, change program
Remote communication range	• At least 2 m (remote control) • At least 3 m (Phone Clip) • At least 7 m (Mini Microphone, TV Streamer) • At least 2 m (Made for iPhone control) • At least 7 m (Made for iPhone streaming) • At least 7 m (Android streaming*) * available only on compatible Android devices

Battery module

Type	Capacity/voltage range
Disposable battery module	Two PR44 (zinc air) button cell batteries. 1.45 V (nominal) each. Cochlear recommends 675 zinc air batteries designed for cochlear implant use.
Compact battery module	91 mAh / 3.7 V
Power extend battery module	183 mAh / 3.7 V

Coil

Characteristic	Value / range
Operating voltage	2.0 V to 2.6 V
Operating frequency	5 MHz
Data Rate	1.25 Mpbs (4 CPC), 1 Mbps (5 CPC)
Protocols	Cochlear's proprietary embedded protocol employing a series of 4 or 5 consecutive pulses at 5 MHz
Separation between coil and implant	1-10mm

Sound processor to implant inductive link

The inductive link between the sound processor coil and the implant performs two functions: it transfers power from the sound processor to the implant, and provides a bi-directional data communication link. Both power and data are transferred in the reactive near H-field. The link uses a Cochlear proprietary embedded protocol employing a series of 4 or 5 consecutive pulses clocked at 5 MHz and operates over a distance of 1-10mm. Data validity and parity checking are used to ensure correct data transfer. In the presence of interference, the sound processor triggers a "coil-off" orange light indication and the Nucleus Smart App provides a visual indication that the coil is decoupled from the implant.

Wireless technology

Characteristic	Value / range
Technology	Proprietary low power bi-directional wireless link
Power output	1 mW (0 dBm)
RF frequency	2.4 GHz (range 2.40 - 2.83 GHz)
Radiated power	-3.2 dBm
Channel spacing	1 MHz
Maximum data rate	2 Mbps
Modulation	GFSK
Protocols	NXP2 protocol: Proprietary wireless protocol based on GN ReSound's low power bi-directional wireless link (Proximity 2 protocol). Bluetooth Low Energy: Commercially available low energy wireless protocol.
Wireless transmission range	At least 3-7 m depending on accessory At least 2 m for CR310 and MFi control At least 7 m for MFi streaming

Wireless communication link

The wireless communication link operates in the 2.4 GHz ISM band using GFSK (Gaussian frequency-shift keying), and a proprietary bidirectional communication protocol. It continuously switches between channels to avoid interference on any specific channel.

- The remote control operates over 4 channels, over a distance of at least 2 metres from the sound processor. It indicates via its display when the sound processor is out of operating distance (or switched off) or when the link is interrupted due to broad spectrum interference (see remote's user guide for more information).
- The True Wireless accessories operate over 16 channels, over a distance of at least 3 metres for the Phone Clip, and 7 metres for the Mini Microphone and TV Streamer.

Bluetooth® Low Energy also operates in the 2.4 GHz ISM band, using frequency hopping over 37 channels to combat interference. Operating range is at least 7 metres, and the app indicates when the sound processor is out of operating distance (or switched off) or when the link is interrupted due to broad spectrum interference.

Product component dimensions (Typical values)

Length	Width	Depth	Diameter
Nucleus 8 processing unit with medium earhook and compact battery module			
34.5 mm	8.9 mm	41.3 mm	N/A
Disposable battery module			
28.9 mm	8.9 mm	17.3 mm	N/A
Compact battery module			
15.9 mm	8.9 mm	17.6 mm	N/A
Power extend battery module			
24.8 mm	8.9 mm	17.6 mm	N/A
Nucleus 8 Coil			
N/A	N/A	6.4 mm	30.7 mm

Product weight (Typical values. All weights are measured with a medium earhook.)

Component	Weight
Nucleus 8 processing unit (no battery module)	3.3 g
Nucleus 8 processing unit with compact battery module	6.9 g
Nucleus 8 processing unit with power extend battery module	9.4 g
Nucleus 8 processing unit with disposable battery module (including two 675 zinc air batteries)	9.9 g
Nucleus 8 coil and cable (without coil magnet)	3.9 g

Electromagnetic compatibility (EMC)

Guidance and manufacturer's declaration - electromagnetic emissions

The Nucleus 8 Sound Processor is intended for use in the electromagnetic environment specified below. The customer or the user of the Nucleus 8 Sound Processor should assure that it is used in such an environment.

Emissions Test	Compliance	Electromagnetic Environment-Guidance
RF emissions CISPR 11	Group 1	The Nucleus 8 Sound Processor uses RF energy only for its internal function. Therefore, its RF emissions are very low and are not likely to cause any interference in nearby electronic equipment.
	Class A	(Wired Programming Mode) The Nucleus 8 Sound Processor is suitable for use in clinics and hospitals.
	Class B	(Normal Mode, Wireless Programming Mode) The Nucleus 8 Sound Processor is suitable for use in all establishments, including domestic and those directly connected to the public low voltage power supply network that supplies buildings used for domestic purposes.
Harmonic emissions IEC 61000-3-2	Not applicable	
Voltage fluctuations/ flicker emissions IEC 61000-3-3	Not applicable	

Guidance and manufacturer's declaration - electromagnetic immunity

The Nucleus 8 Sound Processor is intended for use in the electromagnetic environment specified below. The customer or the user of the Nucleus 8 Sound Processor should assure that it is used in such an environment.

Immunity Test	Compliance Level	Electromagnetic Environment- Guidance
Electrostatic discharge (ESD) IEC 61000-4-2	Contact discharge: ± 8 kV Air discharge: ± 2, ± 4, ± 8, ± 15 kV	Floors should be wood, concrete or ceramic tile. If floors are covered with synthetic material, the relative humidity should be at least 30%.
Electrical fast transient/burst IEC 61000-4-4	Not applicable	Not applicable
Voltage dips, short interruptions and voltage variations on power supply input lines IEC 61000-4-11	Not applicable	Not applicable
Power frequency (50/60 Hz) magnetic field IEC61000-4-8	30 A/m	Power frequency magnetic fields should be at levels charcteristic of a typical location in a typical commercial or hospital environment.

Guidance and manufacturer's declaration - electromagnetic immunity

The Nucleus 8 Sound Processor is intended for use in the electromagnetic environment specified below. The customer or the user of the Nucleus 8 Sound Processor should assure that it is used in such an environment.

Electromagnetic environment - guidance

Portable and mobile RF communications equipment should be used no closer to any part of the Nucleus 8 Sound Processor, including cables, than the recommended separation distance calculated from the equation applicable to the frequency of the transmitter.

Immunity Test: Conducted RF IEC 61000-4-6

Compliance Level: 3 V 0.15 to 80 MHz; 6 V in ISM 0.15 to 80 MHz

Recommended separation distance $d=1.16\sqrt{P}$

Immunity Test: Radiated RF IEC 61000-4-3

Compliance Level: 10V/m 80 MHz to 2.7 GHz

$d=0.35\sqrt{P}$ 80MHz to 800MHz

$d=0.70\sqrt{P}$ 800 MHz to 2.7 GHz

where P is the maximum output power rating of the transmitter in watts (W) according to the transmitter manufacturer and d is the recommended separation distance in metres (m).

Field strengths from fixed RF transmitters, as determined by an electromagnetic site survey, should be less than the compliance level in each frequency range.

Interference may occur in the vicinity of equipment marked with the following symbol:

Electromagnetic environment - guidance

Immunity Test: Proximity fields from RF wireless communications equipment IEC 61000-4-3.

Compliance Level: 385 MHz (27V/m); 450, 810, 870, 930, 1720, 1845, 1970, 2450 MHz (28V/m); 710, 745, 780, 5240, 5500, 5785 MHz (9 V/m)

⚠️ **Warning:** Portable RF communications equipment (including peripherals such as antenna cables and external antennas) should be used no closer than 30 cm (12 in.) to any part of your Nucleus 8 Sound Processor, including cables specified by the manufacturer. Otherwise, degradation of the performance of this equipment could result.

Note:

- At 80 MHz and 800 MHz, the higher frequency range applies.
- These guidelines may not apply in all situations. Electromagnetic propagation is affected by absorption and reflection from structures, objects and people.
- If abnormal performance is observed, additional measures may be necessary, such as relocating your position, or reorienting the Nucleus 8 Sound Processor or accessories, before attempting the action again.

Radio Frequency Identification

RFID uses electromagnetic fields to automatically identify and track tags attached to objects. Interference may occur in the vicinity of equipment that uses RFID readers, such as shop security, card scanners, contactless payments.

Note: The existence of fixed or mobile RFID readers may not be visible as you pass through a RF zone.

Environmental conditions

Condition	Minimum	Maximum
Storage and transport temperature	-10° C (+14° F)	+55° C (+131° F)
Storage and transport humidity	0% RH	90% RH
Operating temperature (sound processor)	+5° C (+41° F)	+40° C (+104° F)
Operating temperature (battery charger)	0° C (+32° F)	+40° C (+104° F)
Operating relative humidity	0% RH	90% RH
Operating pressure	700 hPa	1060 hPa

The temperature of the sound processor and its accessories may rise by up to 2.7° C (4.86° F) during normal operation, and could result in these components reaching a temperature of +42.7° C (+108.86° F) when operated at the maximum environmental temperature of +40.0° C (+104° F).

Disposable batteries

Check the battery manufacturer's recommended operating conditions for disposable batteries used in your sound processor.

FCC (Federal Communications Commission) compliance

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with part 15 of the FCC Rules, including part 15B for equipment classes with Unintentional Radiators. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

RF exposure safety

This device complies with the FCC RF exposure limits and has been evaluated in compliance with portable exposure condition.

There is no limitation as to which distance can be used from the human body.

Class B device notice

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet or a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

FCC ID: WTO-CP1110

Supplier's declaration of conformity

47 CFR § 2.1077 Compliance Information

Unique identifier: CP1110

Responsible party: Cochlear Americas

10350 Park Meadows Drive
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Toll free: +1 800 483 3123

Telephone: +1 303 790 9010

https://www.cochlear.com/us

Cochlear Ltd warrants that each unit marketed under this Supplier's Declaration of Conformity will be identical to the unit tested and found acceptable with the standards.

The devices will continue to comply within the variation that can be expected due to quantity production and testing on statistical basis.

The records maintained by the responsible party will continue to reflect the devices being produced under the Supplier's Declaration of Conformity.

ISED compliance

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

This device complies with ISED license-exempt RSS(s). Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

RF exposure safety

This device complies with the ISED RF exposure limits and has been evaluated in compliance with **portable** exposure condition.

There is no limitation as to which distance can be used from the human body.

CAN ICES-003 (B)

This Class B digital apparatus complies with Canadian ICES-003.

IC: 8039A-CP1110

Equipment classification

Your sound processor is internally powered equipment Type B applied part as described in the international standard IEC 60601-1:2005/A1:2012, Medical Electrical Equipment–Part 1: General Requirements for Basic Safety and Essential Performance.

Labelling symbols

The following symbols may appear on your sound processor or accessories and/or packaging:

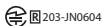|	
	Refer to instruction manual
	Consult instructions for use
	Specific warnings or precautions associated with the device, which are not otherwise found on the label
	Manufacturer
	Compatible sound processors
EC REP	Authorised representative in the European Community
UDI	Unique Device Identification
MD	Medical Device
REF	Catalogue number
SN	Serial number
LOT	Batch code
	Date of manufacture
	Temperature limits
$C \epsilon_{0123}$	CE registration mark with notified body number
$C \epsilon$	CE registration mark

⚠ LATEX	Contains or presence of natural rubber latex. May cause allergy.
⚠	Radio compliance certification for Australia and New Zealand
⊜ℝ 203-JN0604	Radio compliance certification for Japan
ℂ	Radio compliance certification for Korea
Rx Only	By prescription
♻	Recyclable material
⊠	Dispose of electrical components in accordance with your local regulations
⭑	Type B applied part
IP54	Ingress Protection Rating • Protected against access of solid foreign objects greater than or equal to 1.0 mm diameter. • Protected against failure from dust penetration. • Protected against failure from splashing water.
IP68	Ingress Protection Rating • Protected against access of solid foreign objects greater than or equal to 1.0 mm diameter. • Protected against dust penetration. • Protected against failure from continuous immersion in water up to 1 metre deep for up to 1 hour.

Cochlear implant compatibility

The Cochlear Nucleus 8 Sound Processor is compatible with the following Nucleus Cochlear 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 S8 (CI8REH), Hybrid S12 (CI12REH))
- CI24R Series Implants: CI24R (CA), CI24R (CS), CI24R (ST)

CI24M Series Implants: CI24M, ABI24M, CI 11+11+2M, CI24MH (CI6+16+2M)

Legal statement

The statements made in this version of the User Guide are believed to be true and correct as of the date of publication. However, specifications are subject to change without notice.

Trademark legal notice

Notes

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Hear now. And always

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