Invisicom™ Instruction Manual

Instant Fit Broadcast Earpieces

Hearing Electronics Limited

Safety Information

The Invisicom speaker may be more sensitive than previous products you have used; before wearing for the first time, be sure to set the volume to minimum. Gradually increase to a comfortable listening level. Optional attenuators or limiters are available (ask for details).

Excessive noise exposure can be damaging to hearing, this is cumulative over listening time - do not listen at a high volume for extended periods.

Quick Tips

RED = RIGHT ear and BLUE = LEFT ear

In noisy backgrounds our brains pick out speech better with both ears working - it is best to wear two Invisicom earpieces, both with closed (or double) domes, in these situations. Mono to dual mono and stereo to mono splitters are available as options.

Ears produce wax as part of the body's natural cleaning process – this can get into the dome and wax filter behind. The wax filter protects the speaker itself and is designed to be easily replaced. Regular cleaning of the dome will reduce the need for filter changes.

Hiding the cables – use the cable clip to hold the cable to the collar behind the head, a short distance across to the opposite side of the neck to keep the cable tucked in behind the head. Leave enough slack for unrestricted head movements. If using two earpieces, the cables should cross over behind the head to the opposite side of the collar to ensure both cables are hidden.

Earpiece speaker wire length – Small (0), Medium (1), Large (2).

Spares – once you have identified the correct speaker and domes, carry a spare set for a quick swap out if needed.

About Invisicom™

Traditional methods of designing and manufacturing broadcast monitors require a cast of the ear (known as an "ear impression") to enable an identically shaped earmould to be manufactured. This requires time be allocated for the impression taking process in addition to the manufacturing lead-time.

In traditional products the use of tubing to conduct sound from an acoustic driver (or button speaker) to an earmould results in a loss of signal (predominately in the high frequencies) by the time the sound reaches the ear. Blocking the ear with an earmould (whilst advantageous in very noisy situations) can lead to a perceived distortion of the wearers own voice (the "occlusion effect"). The bulky nature of the earmould and tubing tends to make the device very visible.

InvisicomTM products use technology derived from the hearing aid industry to deliver sound directly into the ear canal via a small speaker that sits almost invisibly inside the ear canal. The speaker is held comfortably in place in the ear by a dome made of hypo-allergenic material. The size of the dome, the length of the wire to the speaker and a left or right fitting can be selected from a kit of pre-manufactured parts to enable an instant fitting and easy replacement of lost or damaged devices.

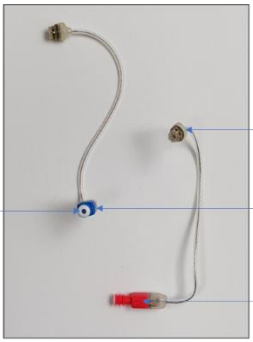
The presence of the speaker in the ear canal allows delivery of a much cleaner sound, with greater clarity as the high frequencies are not attenuated. An open dome avoids the "occlusion effect" – where the wearer can perceive an echo in their own voice that makes it sound (to them) that they have a cold or are speaking in a barrel.

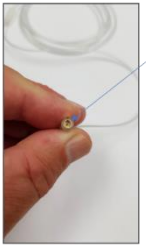
When we speak, we hear our own voice from a mixture of two sources; sound conducted through the air and sound transmitted through the body and bones of the skull – both reach the ear canal. This natural mixing of the two sources is why a recording of our own voice sounds unfamiliar to us - we are only hearing the component that has travelled through the air, not the component that has travelled through the bones of our skull.

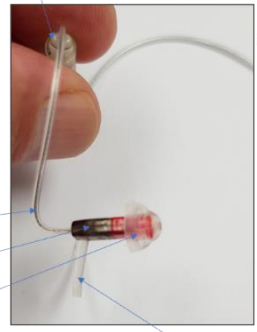
When we block our ears with an earmould or anything else that provides a good seal, we prevent sound conducted into the ear canal via the bones of the skull from escaping – giving a boost to the low frequencies (around 500Hz); leading to the "occlusion effect". Using a soft, open dome avoids this artefact.

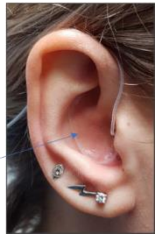
There are times when it may be desirable to partially or fully close (occlude) the ear canal. In noisy situations, a closed dome will mostly (but not fully) seal the ear canal, blocking out a significant proportion of external noise. Larger double domes can be used to fully close the ear canal in very noisy situations. These two options can lead to a return of the echo in the wearers voice. If listening to music, where more bass is desired, using a closed dome will provide a boost to the low frequencies by preventing them escaping from the ear.

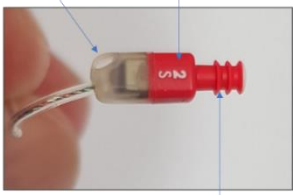
Key Components











How to Wear

With the correct wire length, the socket connecting the speaker to the cable should be just behind the top of the ear.

The speaker and attached dome should be positioned inside the entrance to the ear canal as shown below.

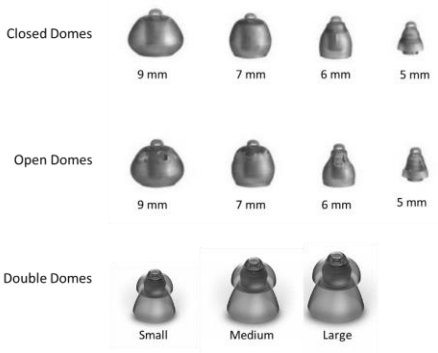
If using double domes (for extra isolation of external noise) the dome will not sit quite as far inside the ear canal – the second (outer and larger) dome should sit at the entrance.

Hiding the cables – use the cable clip to hold the cable to the collar behind the head, a short distance to the opposite side of the middle of the neck to ensure the cable is pulled behind the head. Leave enough slack for unrestricted head movements. If using two earpieces, the cables should cross over behind the head to the opposite side of the collar to ensure both cables are hidden.

TIP: In noisy situations it is best to wear two Invisicom earpieces, otherwise the ear without a device will let in unwanted noise. Our brains can also pick out speech better in noise with both ears receiving a signal.

Choosing the Correct Dome

The purpose of the dome is to comfortably seat the speaker in the ear and, if necessary, block out external noise.



For comfort, open domes should be used unless excessive external noise is present. Closed domes block up the ear to a greater extent (depending on the size chosen) and help reduce external noise.

Double domes add an extra degree of isolation of external noise but can influence the sound of your own voice (known as the occlusion effect). Generally, it is best to choose an open a dome as possible, selecting a more closed option in noise, finally moving to double domes if needed.

Dome size: If selecting a dome for yourself (when you can't see your own ear canal) choose a 7 mm size, attach it firmly to the speaker and test for fit. It should slide comfortably into the ear canal. If the fit is too tight, it can either be uncomfortable, or not sit deeply enough in the ear canal. If the fit is too loose, it can slide out of position.

TIP: Invisicom devices are designed for listing to speech with maximum clarity; if listening to music this can lead to a tinny sound. Using a closed dome will make music sound more natural.

Wire Length and Adjustment

Speakers are marked in red for the right ear and blue for the left. For best fit, use the correct right or left speaker rather than attempting to turn the speaker around on the wire as this will lead to a very poor fit and possible damage.

Size 1 is suitable for most individuals, size 0 is the smallest and size 2 the largest.

If selecting a wire length for yourself, start with size 1 and check that the speaker fits comfortably into the ear canal, the socket is just behind the top of the ear and remains securely in the ear canal.

If using the measuring tool, position it as shown below and estimate the length to the top of the entrance to the ear canal. If between sizes, choose the smaller size. In this example, size 1 should be chosen.

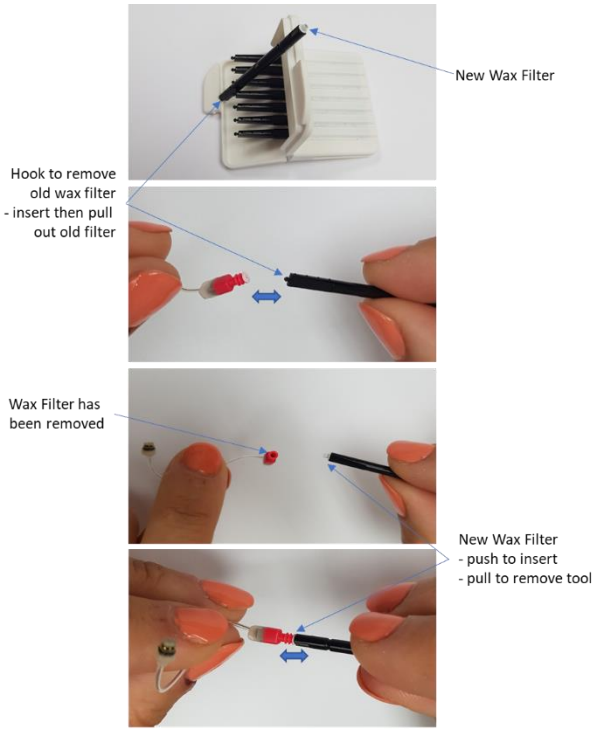
To fine tune the length, gently adjust the bend of the wire near the socket – in order to get more length, straighten out the bend slightly. To shorten, change to a smaller size wire.

Cleaning

Step 1: Dome – brush way any major debris with the brush provided, then clean with antiseptic wipes. A wet-wipe or dry tissue may also be used. This should be done at the end of each daily session and will often be the only step required.

Step 2: (Only if necessary) The dome can be removed from the speaker and cleaned – be sure to clean the central hole to allow sound through. Be sure to ensure it pushed snuggly back into place before use.

Step 3: Wax filter (only if necessary) Remove the dome and use the tool provided with each new wax filter to remove the old filter. Turn the tool around to insert the new filter. Filters should be discarded after use.



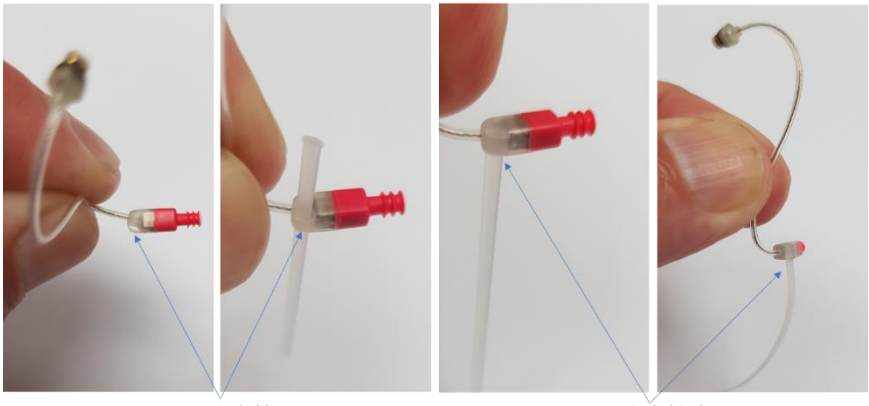
Optional Retention Lock

This is an optional component that can be removed or replaced as needed to aid earpiece retention in the ear.

To remove – push the retention lock towards the speaker (gripping the retention lock with pliers will help get a grip). It will slide out.

To insert – slide into the small slot in the speaker, it should face downwards slightly backwards as shown below. Insert from the side of the speaker without lettering.

To adjust – just as you would curl a ribbon, use a pair of scissors to pull the retention lock across the blade to curve towards the blade. Cut to length if too long.



Insert retention lock here

Retention lock in place

Warranty and Repairs

The Invisicom system is provided with a one-year warranty. Cleaning, servicing and repairs can be provided by Hearing Electronics both during the warranty and afterwards. Please contact us for advice.

Troubleshooting

No sound or poor quality sound

(1) Check the speaker is pushed firmly into the socket above the ear.

(2) Remove the dome and clean, making sure to remove any wax or other debris from the central hole.

(3) Replace the underlying wax filter with a new one.

Poor fit

(1) Check that you are using the correct size dome, try a larger dome if the speaker is loose in the ear. Try a smaller dome if the speaker is difficult to slide into the ear canal or will not fit past the entrance.

(2) Check that speaker wire is not too long or too short.

(3) The length of the speaker wire can be fine-tuned by gently adjusting the angle of the bend where the speaker plugs into the socket that sits above the ear.

(4) If the speaker slides out of the ear, add a retention lock.

Difficult to hear in noise

(1) Use a pair of Invisicom speakers - one in each ear. Use closed domes.

(2) In addition to above, use a double dome each ear.

About Hearing Electronics

Hearing Electronics Limited is an independent manufacturer of bespoke in-ear communication devices and earplugs:

- Broadcast – custom and standard fit earpieces
- Shooting – active hearing protection
- Motorsport – custom-fit communication and hearing protection for drivers, engineers and mechanics
- Aviation - custom-fit aircrew communication earpieces for civil and military aviation
- Leisure – custom made earphones for music, motorcycle communication and hearing protection, swim plugs and sleep plugs
- Made in the UK

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