

Hello there.

SONX USER GUIDE
Firmware 0.9.17 release



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This User Guide was designed for the SonX. In this build, you will be able to enjoy the protection, communication, Earpiece Fit Test, and Override functionalities.

INTRODUCTION

This User Guide explains functionalities, how to properly insert the earpieces, maintenance, and troubleshooting. It is designed to give you clear instructions with simplified diagrams without technical jargon.

Should you require technical support, customer service or want to give feedback for product development, your comments are always welcome and we would love to hear from you.

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Product Overview

EERS' vision is to create real solutions to real world problems; developed and designed to be used by everyone - no matter what industry you work in. We have developed SonX, an industrial Hearables IoT (Internet of Things) device, that addresses three major factors: protection, communication and monitoring.

Protection

The best hearing protection in the world cannot protect if it is not fitted properly. Using the On Demand Earpiece Fit Test you can verify the fit and protection level. If not fitted properly, warning signals will alert you. SonX ensures you are always correctly fitted, always protected.

On Demand In Noise Fit-Test

Ensures you are properly fitted at all times, indicating which ear (or both) needs to be re-fitted.

Level dependent hearing with pass-through mode

Acoustically transparent when used in a quiet environment. SonX' built-in auto protection mode switches from passive or active protection based on ambient noise conditions.

Impulse noise protection

You are always ready for unanticipated loud sounds with impulse noise clipping.

Communication

A person who cannot communicate properly is not fully effective. A person who cannot hear is not safe. When in active mode, SonX is designed to ensure you can communicate in high-noise environments while keeping your hearing protected. In-ear earpiece microphones allow clear radio communication, without the aid of an external device. Furthermore, built-in short-range radio allows you to talk without removing your protection while in high-noise environments. Should you step into a quieter area, your SonX device will enter passive mode. In passive mode, you can have a conversation all the while keeping your hearing protection in.

In-Noise Communication

Improve user safety and reduce accidents and lower the risk of errors by misunderstanding.

2-way communication with color-coded radio channels

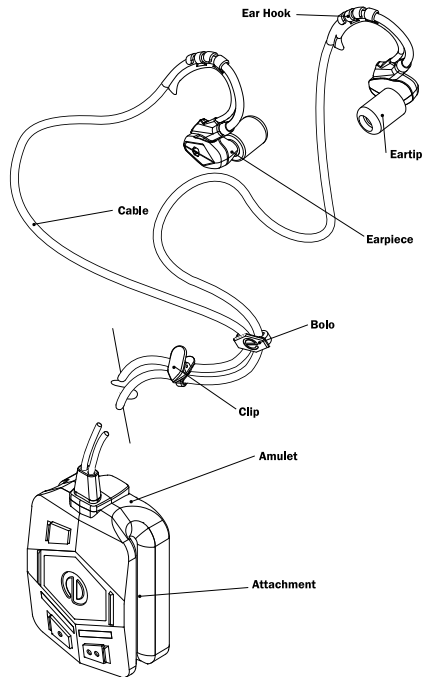
Improve teamwork and productivity through sustained communication. On-site training can safely be done in noise.

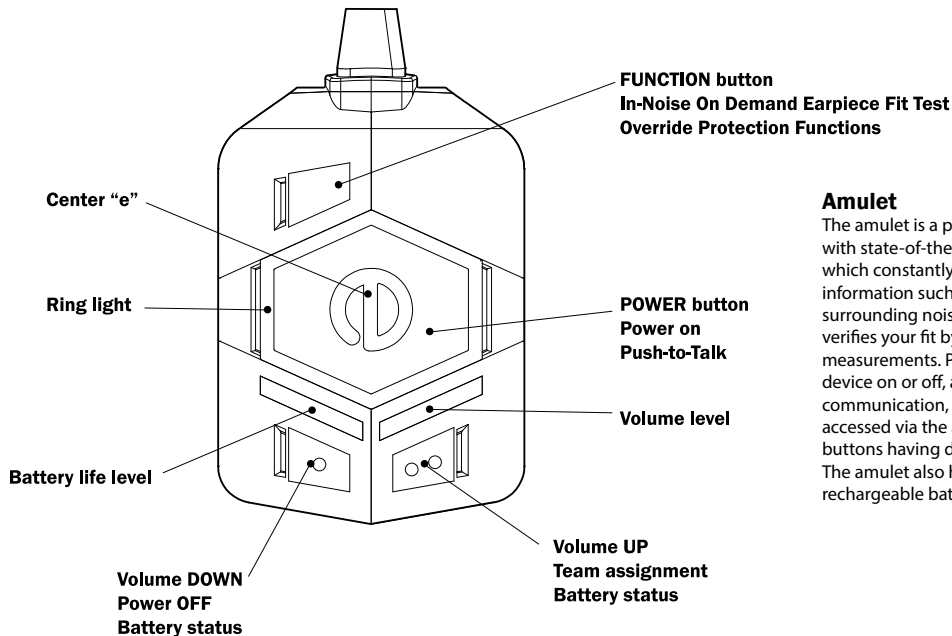
Perceptual comfort

Natural sound, no need to shout to be heard. Best-in-class acoustic transparency mode and pass-through communication in low-noise situation. Low profile earpiece design provides outstanding 360-degree situational awareness.



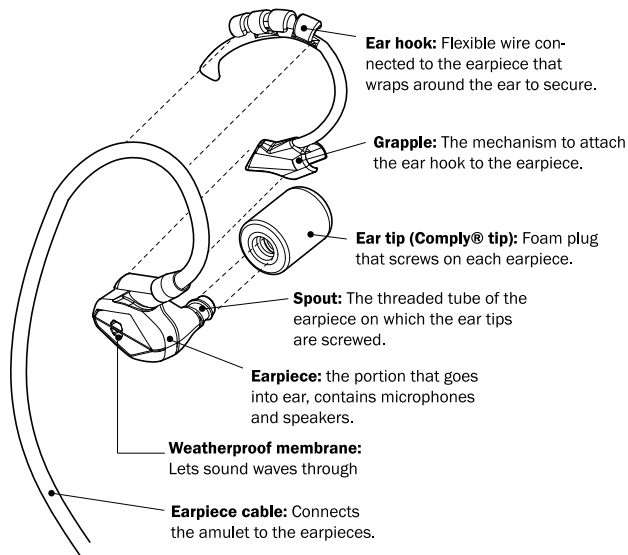
Your device – a quick overview





Amulet

The amulet is a powerful device, with state-of-the-art algorithms, which constantly processes information such as your surrounding noise levels and verifies your fit by taking in-ear measurements. Powering your device on or off, adjusting volume, communication, and fit test, are accessed via the amulet with some buttons having dual functions. The amulet also houses the rechargeable battery.



Earpiece and Cable

The earpiece is comprised of microphones allowing voice pick-up as well as noise level monitoring.

The cable includes a clip, an adjustable bolo and detachable ear hooks to assist you with cable management and a more comfortable wear.

Components, Parts and Accessories

The following items are included:



SonX device: Attached to the amulet are the cables and earpieces.



Replaceable Ear Hooks: Ear hooks will already be fitted to the device. For hygienic reasons, they can be removed and replaced if you need to share or reassign the device. Your manager will have a few extra pairs.



Reusable Comply™ Foam Tips: Included are 3 difference sizes (Large, Standard, and Slim) to attach to the earpiece for use in your first fitting. Your supervisor will have more when you need to replace them.



Battery: Your battery is shipped with a charge but may not be fully charged. Be sure to plug into your individual or master charger before your next use.



One-Port USB Wall Charger: For use to recharge your battery.



Connecting micro USB cable: This micro USB cable works with the One-Port USB Wall Charger or master hub charger your supervisor has been issued.



Carrying Case: Your device comes in a reusable carrying case for you to store your device.

WEARING THE DEVICE



ORANGE Battery charging

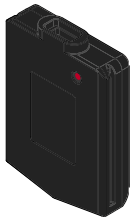
Battery

Your SonX device is shipped with a battery. Depending on the amount of communication requirements, your amulet should work up to 20-30 hours when fully charged.

To install the battery, turn the back of the amulet towards you and holding it by the sides, with the battery label facing downwards, glide the battery male component into the female USB slot in the amulet.

To remove the battery, hold the sides of the amulet and grab the end of the battery. Pull until it slides out.

NOTE: Your battery is shipped with a charge but may not be fully charged. Be sure to plug into your individual or master charger before your next use.



RED Battery fully charged

Charging the Device

To charge your amulet, remove the battery from the amulet and connect to the individual wall charger or 10-port hub charger provided to your supervisor. When plugged in, a LED light will turn on "orange" for charging, and then "red" to indicate the battery is fully charged and ready to use.

TIP:

1. To preserve battery life, turn your device off during breaks or when not in use.
2. The battery can be charged at any time, regardless of depletion.
3. Avoid overheating your battery and reducing its lifetime use: once fully charged remove the battery from the charger.

Battery Light Level

The indicator light will remain green until 20% battery life remains. At this point it will slowly blink RED and you will hear an audio prompt every 10 seconds until the battery is changed out or drained completely. At critical levels at 10% or below the RED indicator light will increase blink rate and you will hear the final audio prompt before it's completely drained.



Low battery indicator

The battery indicator light measures in the following increments:

80-100%: five green

60-79%: four green

40-59%: three green

20-39%: two green

<20%: (low batt): medium blinking red (1 blink/sec x5)

<10%: (batt critical): slow blinking red (1 blink/1.5sec forever)

<1%: (empty): slow blinking red (1 blink/1.5sec forever)

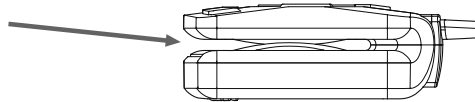
Securing the Device

As shown in the illustrations below, the device can be worn in several different ways. For best performance and easy access, we recommend securing the amulet close to your neck or shoulder, on your clothing or PPE at one of these locations:



Your amulet attach mechanism is designed to slide into place with gentle pressure.

Attach mechanism



Attaching the Ear Tips to the Earpiece

Your ear tips, made by Comply™, are made from military grade heat-activated dynamic memory foam. When compressed and properly inserted into your ear it conforms to the shape of your ear canal and creates a perfect seal.

Learning to Identify Left & Right

Correctly identifying the left and right earpieces is important for comfort, fit, and acoustical seal. Your earpieces have color-coded bands on the ends of each ear hook:

Red = Right

Blue = Left

To help you remember which is which, here is a useful tip: **Red** and **Right** both begin with the letter **R**.

Selecting a Size

Three pairs of color-coded Comply™ Canal Tips are included with your SonX device (one pair of every size):

Slim = Ear tip has a **Green** inner core

Standard = Ear tip has a **Red** inner core

Large = Ear tip has a **Blue** inner core

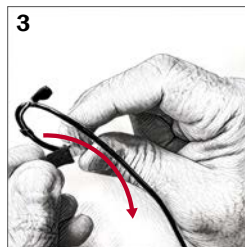
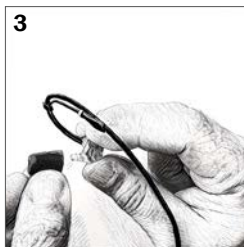
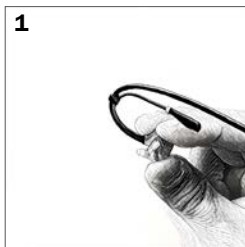
A large percentage of the general population fits Standard-sized tips, so start by trying these first. Do not worry if this first sizing exercise does not work for you, you can always move down or up a size.

Attaching to the Earpiece

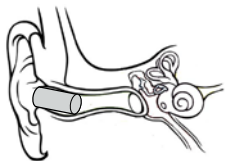
Most people are right-handed which is why the following steps will always start with “Right” as an example. If you are left-handed, you might find it easier to start by fitting your left ear instead.

To attach the ear tip to the earpiece, screw the threaded core in a clockwise motion until it is fully secured as shown by figures 1 through 4 below.

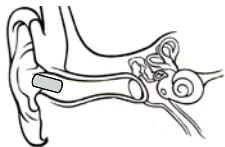
NOTE: Do not overtighten but make sure the ear tip is fully screwed in.



To detach the ear tip from the earpiece, reverse the process and unscrew the threaded core in a counter-clockwise motion until it is fully unfastened.



Good fit: right size conforms to canal and creates an acoustical seal.



Bad fit: wrong size – doesn't expand to ear canal.

Inserting the Earpiece

Ensuring a Good Acoustical Seal

Your ear tips (also called plugs) are meant to be worn fully inserted into your ear. Ear tips need to form a seal with all the walls of your ear canal — like a cork in a wine bottle. Proper insertion is key: forming a tight seal will enhance the performance of your SonX device.

Getting the perfect seal requires finding the correct tip size. Your device comes with assorted sizes of tips as seen in *Selecting a Size and Attaching the Tips*. You started with the Standard-sized Comply™ tips. If Standard size doesn't give you an adequate seal, move down one size to the smaller tips. Try the largest size last — you'd be surprised, but a smaller tip sometimes gives you the more comfortable seal. Ears are as unique as fingerprints. In some cases, a person may require a mixed size of tips for a proper, comfortable fit (Ex. Small for Right ear and Medium for Left ear).

A good fit is important: it means you are properly protected. A poor fit will drop sound quality and will affect your overall team's quality of communication adding background noise or low volume output.

NOTE: To avoid dropping your device while fitting your earpieces, hold the amulet in one hand and in the other hand the earpieces. Hang it over your neck, or attach it to your clothing while attaching the amulet. This way you can safely insert the earpieces and adjust the securing mechanisms (bolo and clip). With your amulet attached, separate your Right from your Left earpiece by swinging your Left earpiece to the left side in front of you.

Proper placement of your device



1. Remember, Red/Right therefore Left is Blue. For your right ear, with your right hand, hold the right earpiece between your thumb and two forefingers (the ear hook needs to be over your fingers).



2. Using your left hand, compress the ear tip into a thin, round cylinder:

- a.** Press the tip of the plug down.
- b.** Working from the top toward end of the plug, compress the tip of the plug so it does not inadvertently risk folding over and blocking the ear canal once it's inserted.
- c.** Roll it between your 2 fingers for 15-20 seconds. With this method, the ear tip's inner flexible tube is less likely to collapse.

NOTE: Do not over pinch the top or create creases in the foam prior to insertion. This will affect acoustical seal.



3. Once the tip is compressed, with your opposite hand over and behind your head, gently pull back your ear (or pinna) to straighten the ear canal.
4. Hold the earpiece in your other hand with the ear hooks bent into a curve that mimics your ear shape.
5. Gently insert the ear tip as far as you can, then twist the earpiece and ear hook backwards into place.



6. After insertion, hold for 15-20 seconds to allow the foam to expand into place.
7. Repeat the same procedure for your other ear and adjust your ear hooks if necessary for maximum comfort.



a: tight fit



b: loose fit

Securing the Earpiece to your Head

Your device comes with a bolo to secure the cables behind your head and a clip to attach the cables to your clothing or equipment.

1. You can either
 - a. slide and secure the bolo to the center of the back of your head until you feel the cable is snug and tight to your head (Image a, tight fit) or;
 - b. Try a loose fit at the base of your neck (images b & c, loose fit).
2. Use the clip to secure the wire close to your body. A shirt collar is usually a good place to put it (for more options, see section Securing the Device).
3. When the cables are securely placed, turn your head from left to right and right to left. If there is a sensation of pulling, readjust the bolo and the clip so you may have as much free movement as possible.

TIP: Some users have a lot of personal protection equipment (PPE) to wear: gloves, masks, etc., making it a challenge to do the fitting of the device to your head and clothing. We recommend using the “Buddy System” to ensure a better success rate in the final adjustments of your SonX device.



AUTO pass-through mode



AUTO protected mode

Level-dependent protection

Your device is constantly adapting to your environment to create the best perceptual comfort. With these 2 auto settings, Pass-through and Protected mode, you will have excellent 360-degree awareness. You can tell which mode you are in by the change in the LEDs.

Intelligent Pass-Through

This mode operates when the ambient noise is lower than 85 dB(A).

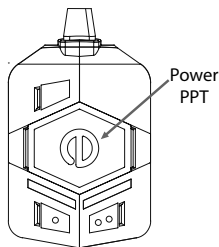
In this mode, ambient sounds are reproduced by the inner speakers inside your ear so you don't need to keep taking off your earpieces. The intelligent pass-through mode includes a volume limiter, which caps the intensity of loud sounds (e.g. impulsive sounds like a hammer). The inside LED lights from battery and volume will be constant GREEN.

Protected Mode

This mode will be triggered, when ambient noise is higher than 85 dB(A) for more than 2 seconds. Once it is triggered, this mode will disengage only if the ambient sound level dips below 80 dB(A) for more than 2 seconds. In this mode, ambient sounds are completely muted. Only SonX audio prompts and radio communications can be heard. The far-left LED light from volume and far-right LED light battery (outside lights) will be constant GREEN.

TIP: If you are not sure when you to perform your In-Noise Earpiece Adaptation, take note of when your amulet lights switch to protected mode. At this time, noise levels are at the correct level and you can press SELECT to start the fit test.

USING THE DEVICE



Once you have the right sizing and acoustical seal you are ready to turn on your device, perform your Earpiece Fit Test, and start using your SonX.

Turning the Device On

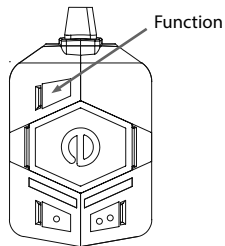
To turn on the device, do a long 2-second press the POWER button. The amulet will light up with the following LED pattern and, if you have your ear tips inserted, you will hear a 7-second “ramping up” audio prompt. The indicator lights will pulse regularly when in stand-by.

Note: Every time SonX is powered off and on, the device remembers your last volume setting. To increase or decrease press up or down on the volume buttons.



Power ON

Performing an Earpiece Fit Test



You will need to do an in-noise Earpiece Fit Test to ensure your communication works well. This test must be done every time you power up your amulet or remove an earpiece. It needs to be done in noise (above 85dB) and can be done at ANY time to ensure your hearing is always protected.

Press the "FUNCTION" button and release. While the unit is completing the Earpiece Fit Test, do not talk, chew or touch any of the other buttons. You will hear a ramping up audio prompt and see the Amulet flash WHITE. The test may take up to 10 seconds to complete. A successful PASS fit test will look like this with an ascending audio prompt.



Fit Test: initiation sequence



Fit Test: PASS indicator lights
for a successful Earpiece Fit Test

If you have a poor fit, you hear a descending audio prompt and see the ring light up a constant RED, on either side with GREEN and RED, depending on your actual fit.

If the RED is on the left side of the amulet, your fit was a FAIL on the left but a PASS on the right ear. Conversely if it's RED on the right side, you were successful on the left. To fix the issue, move to a safe noise level area, and repeat the process of ear tip insertion, for both or the failed left or right ear.



Fit test: Left ear FAIL



Fit test: Both ears FAIL



Fit test: Right ear FAIL

Your earpiece fit sometimes will fall into a moderate rating: your protection is maintained but your fit may impact level of quality in your communication. The ORANGE visual prompt and a descending audio prompt will indicate what ear(s) is moderate fit. Here are some of the types of results you might get.

If you are still having trouble, ask with your supervisor or a super user for assistance. You may need to change size tip, are not inserting the foam tip deep enough, or incorrectly compressing the tips before putting them in your ear canal. Repeat the Earpiece Fit Test, and once successful, you are ready to use your amulet.



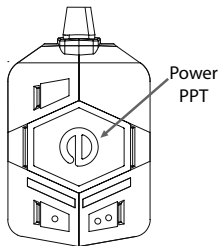
Fit Test: Both ears
MODERATE fit



Fit Test: MODERATE fit
right ear, PASS left ear.

NOTE: It is the user's responsibility to regularly perform an Earpiece Fit Test to ensure protection at all times. The Earpiece Fit Test can be done in noise, by selecting the SELECT button. Anytime the device is turned off, or battery is removed, a Fit Test will need to be performed.

When referring to Left and Right, it is anatomical to the way SonX is worn: when SonX is vertical as shown, the left of the device is your left ear.



Talking in Noise (Push-to-talk/PTT)

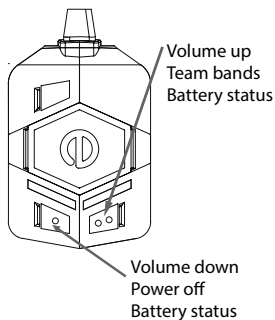
STOP: Until you have passed your Earpiece Fit Test you should not use the communication functions in noise.

The center POWER button is used to turn the device on and to communicate. The push-to-talk works like a walkie-talkie would - you must push the button each time for the duration you need to talk, and release to hear anyone else who is also using a device. When pressed, the amulet will light up and you will hear a short ascending "bi-dip" audio prompt: this means you are connected and that other team members can hear you. You don't need to shout or raise your voice. Everyone wearing the amulet on your radio band will hear you. When you release, a short descending "bi-dip" can be heard: only you can hear this and is designed to let you know your message has been sent.

If you hear a very short negative "beep" audio prompt: you and another user are trying to communicate at the same time. Wait and try again.

NOTE: if you have a poor fit, all team communication will be affected. Speak normally: speaking very quietly will also affect sound quality.

TIP: You can use other communication devices (such as radio or mobile phone) without removing your SonX – as long as you don't touch the device to the SonX earpiece. Touching the sensitive membrane on the outside of the earpiece could trigger the device to engage impulse clipping and temporarily block sound completely.



Adjusting volume

Your device is always set to a default medium volume setting. To increase or decrease press UP or DOWN on the volume buttons. The red light indicates your volume is at maximum.

Detecting Battery Level

A quick press of either VOLUME button will show you the battery level. A slow blinking red indicator light means low battery with 20% remaining. At 10%, the low battery light will start to blink fast until completely drained.

Assigning Team-Based Communication Groups

For team assignments, a long press of the VOLUME UP button will cycle through the available radio channels available.



Team: Magenta



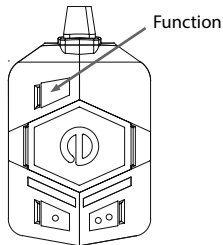
Team: Turquoise



Team: Yellow



Team: Blue



Team assignments are useful for department work or project-based groups that need to keep communication with each other. The available colors are Magenta, White, Yellow, Blue

NOTE: Some colors work better in high light (outdoor) environments.

Overriding Protection Functionalities

Sometimes you might need to override the level-dependent protection functionalities.

Forced Protected Mode

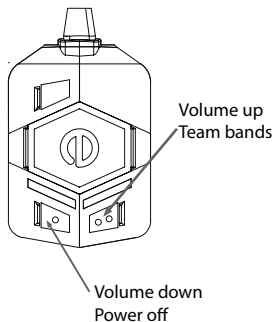
In some cases, external sounds, such as strong winds or wide variances in noise levels, can trigger the “protected mode” to kick in, resulting in some lags in communication. In these instances, you can override the auto protect functionalities. If you need to work in double protection work environments, using the forced protected mode under your ear muffs works well.

Forced Pass-through

Forced Pass-through is useful in a number of circumstances. If you are in a safe noise level but you need to converse with someone who is not using a SonX. When selecting this mode, you will be able to hear them clearly, while keeping your protection in place. It is also useful for long periods in quiet noise or answering your radio or mobile phone, without risk of triggering your “protected mode”. Be mindful to reset functions.

Using Override Functions

With a very quick press of the FUNCTION button, SonX will cycle through your 3 options: Force Protected, Forced Pass-through, and reset.



1. First press - Forced Protected Mode: You will hear a downward sliding audio prompt and the inside LED lights from battery and volume will begin to flash GREEN.

2. Second press - Forced Pass-through: An upward sliding audio prompt will be heard with the far-left LED light from volume and far-right LED light battery flashing GREEN.

3. Third press - Auto Protect: The third press in the cycle resets SonX back to Auto Protect. You will hear a robotic mid tone audio prompt. Depending on your ambient the sound levels, the external LED lights will stop flashing and will migrate to either solid GREEN inside or outside.



Forced PROTECTED mode "ON"



Forced PASS-THROUGH mode "ON"

Turning SonX off

Press the Volume DOWN button for hold 2 seconds. The indicator lights will go down in sequence with a cascading descending audio prompt until the unit is powered down.

CLEANING AND MAINTENANCE

Cleaning the Amulet

Inspect your amulet regularly for dust and grime. Wipe with a damp cloth using mild soap if necessary. Do not use alcohol-based products. Store in its carrying case when not in use.

TIP: Compressed air works well to remove accumulated dust.

Maintaining the Ear Tips

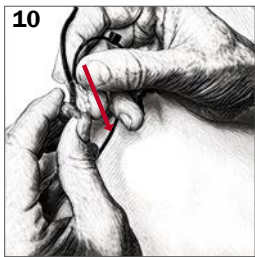
Your ear tips are designed for long term use. Change ear tips as necessary. We recommend doing so every 4 weeks. Inspect for lack of compression or excessive dust. To clean the foam ear tips, unscrew from earpiece and gently wipe them with a clean, damp cloth. Use water only. Do not clean tips with detergents or alcohol-based cleaning solutions. Let tips dry completely before next use.

NOTE: Using wet foam ear tips will not create an adequate acoustical seal: always use dry ones.

Attaching the Ear Hooks

Two detachable ear hooks are included with your SonX device and are pre-mounted onto the earpieces. In the event they are not properly secured or you wish to replace them, follow these steps:

To attach the ear hook, insert the grapple around cable, slide down and push up to lock into hooked position and then insert the wire into middle clip as shown by figures 9 through 12.



To detach ear hook, reverse the instructions: remove cable from middle clip. Then rock grapple gently back and slide up to free from hook.

TROUBLESHOOTING

Performing a Hard Reset

On occasion, the device may not respond properly. First line of defense is to perform a “hard reset”:

1. Power down the device.
2. Remove battery
3. Wait 5 seconds and reinsert.
4. Press the POWER button to turn back on.

Performing a Factory Reset

Simultaneously press single-dotted (volume down), double-dotted (volume up) and FUNCTION button. While holding these 3 buttons, then press POWER button for 2 seconds, then release all 4 buttons. This operation will take about 40 seconds.

NOTE: A factory reset should only be performed upon request by EERS tech support.

Locate Version Number of your SonX

For debugging purposes, you will need the version number. While in a quiet environment, hold the FUNCTION button for 7 seconds. You will hear a voice read out the version number.



Ring Light Shows Red when Turning on Device

At start up the device shows an Red right light.

SOLUTION: Try a hard reset of your SonX by powering down the device. If the problem persists, contact your supervisor.



Ring Light Shows Flashing when Performing an Earpiece Fit Test

If you get a flashing RED light while performing the Fit Test, there are 2 reasons why this might happen. First, the noise level isn't high enough or there was a volume drop during the test. Second, you might have been pressing other buttons or speaking. In either of these cases, the amulet will show this visual pattern and have a descending audio prompt.

SOLUTION: For either of these 2 situations, you do NOT need to refit your earpiece. Simply ensure you are in constant high noise and press FUNCTION button again to redo the test. If the problem persists, contact your supervisor.

RADIO FREQUENCY WARNINGS

FCC

This device complies with part 15 of the FCC Rules. 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.

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

If the device has removable antennas then a list of the antennas that may be used with the device must be included in the user manual. The list should identify the type of antenna, impedance (usually 50 ohms), and the maximum gain in dBi.

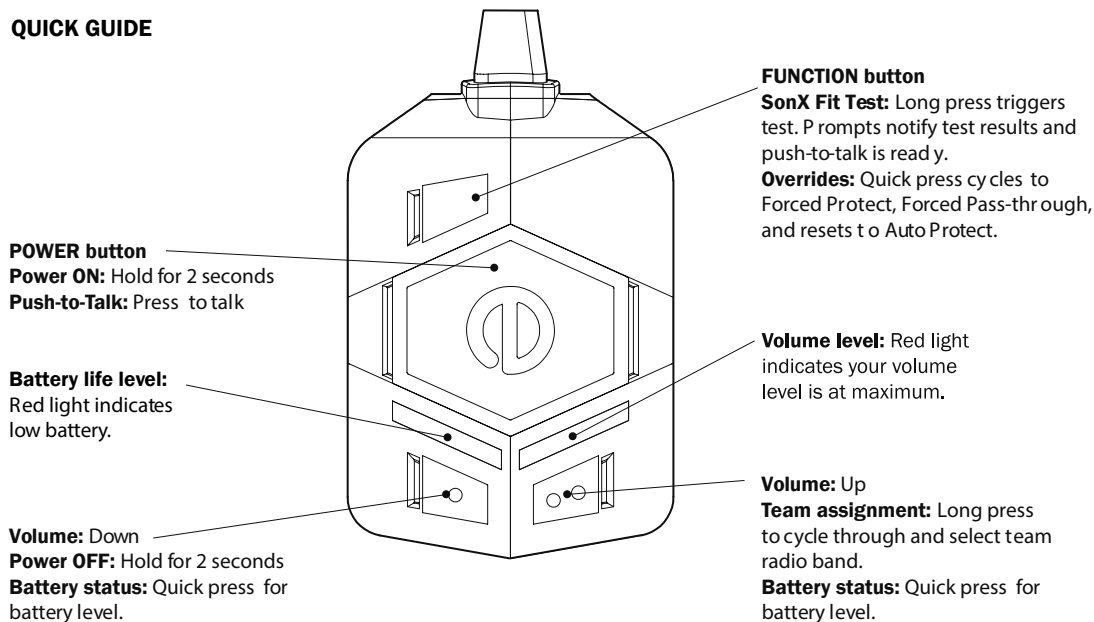
IC

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

HEALTH CANADA RF EXPOSURE WARNING STATEMENT

This device complies with Health Canada's Safety Code. The installer of this device should ensure that RF radiation is not emitted in excess of the Health Canada's requirement. Information can be obtained at http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/radio_guide-lignes_direct/index-eng.php

QUICK GUIDE



PROPER EAR TIP INSERTION



1. Roll between clean fingers to compress and prepare ear tip.



2. Hold pinna upwards and back, insert tip and twist. Fit ear hooks into place.



3. Wait 15-20 seconds to create good seal before doing other ear.