
Z SERIES

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INTRODUCTION TO Z SERIES

With Z Series™, Starkey Hearing Technologies introduces a complete product line that was developed to simplify the process of fitting and using hearing aids. Within the Z Series product line is a full range of custom, behind-the-ear (BTE) and receiver-in-canal (RIC) hearing aids, all available at multiple technology levels, making hearing aid selection very easy. Additionally, Z Series offers Starkey Hearing Technologies' most advanced new features including Auto Experience Manager, which eases the patient's transition into a new pair of hearing aids; Acuity Directionality™ designed to improve patient satisfaction with noisy environments, which addresses hearing aid users' most difficult situations; new microphone covers on standard products to improve the reliability of Z Series products, making care and maintenance simpler than ever; and finally, Stream Boost, 900sync™ Technology and the SurfLink® Mobile 2 which improve both the professionals' and patients' experiences with wireless accessories.

For information on Auto Experience Manager, Acuity Directionality and Stream Boost, see the other articles featured in this issue of Innovations. This article will discuss Z Series' new microphone covers, 900sync Technology and SurfLink Mobile 2.

NEW MICROPHONE COVERS ON STANDARD PRODUCTS

One update from our 3 Series™ standard products is a new microphone cover. Microphone covers are designed to prevent foreign materials from

entering the microphone port(s). Routine maintenance or replacement of a microphone cover helps ensure optimal hearing aid performance. It becomes problematic when frequent maintenance is required due to plugging of the microphone cover. We want to reduce the amount of time you invest in frequent maintenance related to microphone covers, so our design team set out to develop a microphone cover that would significantly extend the amount of time before maintenance or replacement is required. Extensive foreign material ingress testing, hydrophobic and oleophobic water and wax ingress testing, and acoustic testing indicated a dual-slot design, pictured in Figure 1, resulted in the best performance.



Figure 1: Dual-slot microphone cover design featured on Z Series standard products.

While changes to the Z Series hardware may seem minimal from the outside, it's our 900sync Technology where advancements within the Z Series are truly evident.

900sync TECHNOLOGY

Wireless connectivity is becoming the preferred method for communication in today's world. Users expect the performance and reliability of their wireless devices to be comparable to their wired devices. They don't want to worry about wireless interference or wireless signals they cannot see. To address the proliferation of wireless technology and its inherent environmental challenges, Starkey Hearing Technologies developed the innovative 900sync Technology for the Z Series hearing devices.

At the core of 900sync Technology is a next generation radio, which is integrated into each Z Series hearing device. It provides consistent and reliable wireless performance, even in troublesome environments. 900sync Technology is designed to provide artifact-free audio streaming for distances up to 15 feet, allowing a patient to move around or change head positions without audio artifacts or loss of signal. For a professional, this translates into greater flexibility when positioning a SurfLink Programmer and more robust connections during wireless programming sessions.

To better understand the improvements, it helps to have a basic understanding of a wireless system. Wireless communication works by creating electromagnetic waves at a transmitting source (e.g., SurfLink Mobile) and being able to receive those signals at a receiving destination (e.g., hearing instrument). To improve wireless system performance over a certain distance (range), Starkey Hearing Technologies engineers focused on increasing both transmit power and receiver sensitivity. Doing so provides a much-needed safety margin in challenging environments, or environment in which distance, reflections from walls, people or interference get in the way. As a simple analogy, transmit power is how loud someone is yelling; receiver sensitivity would be how soft a voice someone can hear; and interference would be like trying to hear in a noisy restaurant.

Patients believe their hearing devices should flawlessly operate in any environment. Yet, no matter how diligent they are or how good their wireless hearing devices are, some interference is to be expected. Wireless environments are too dynamic and complex to avoid all issues. With Starkey Hearing Technologies' new 900sync Technology, Z Series hearing devices are significantly less susceptible to environmental interference, provide more robust audio streaming at distances up to 15 feet, and offer more reliable

TRANSMIT POWER refers to the broadcasted signal strength. Increasing transmit power allows for more robust wireless programming sessions, more reliable two-way communication during SurfLink Mobile 2 cell phone calls and more dependable ear-to-ear communications (such as a volume change initiated at one hearing device and automatically transmitted to the other hearing device).

RECEIVER SENSITIVITY refers to the minimum signal level the destination radio can process. By increasing receiver sensitivity, the radio can successfully detect lower power signals. Not only does this increase the audio streaming signal range (nearly doubling range over our previous generation wireless hearing devices), but it also provides a more robust audio streaming connection at a shorter range.

Together, Transmit Power and Receiver Sensitivity form the basis of a Link Budget, which is the total amount of signal attenuation (loss) you can have between the transmitter and receiver and still have communication occur. In challenging environments, a larger Link Budget provides a safety margin, ensuring more consistent and reliable wireless performance

communication with both the SurfLink Programmer and SurfLink Mobile. Designed for today's busy world, 900sync Technology delivers an improved wireless hearing device experience.

SURFLINK MOBILE 2

In today's technology-driven world, it is not enough that your electronic device works; it has to look good and be easy to use, too. Electronic devices need to balance consumer expectations for performance and usability into a simple product design. A well-designed, good-looking graphical user interface (UI) allows a consumer to easily interact and feel comfortable with otherwise complex technology.

SurfLink Mobile 2 is a cell phone transmitter, assistive listening device, media streamer and hearing device remote control all rolled into one. With input from patients and professionals, the SurfLink Mobile 2 has been redesigned to provide a better user experience and twice as much streaming battery life (up to eight hours). The SurfLink Mobile 2 includes a simplified UI and integrates highly requested new features. The goal was to make it easier for patients to use, make it easier for professionals to counsel patients, and provide a logical setup sequence for professionals.

From a patient's usability standpoint, the most noticeable simplification is the Streaming screen (Figure 2). It now clearly displays all available audio sources (up to two Bluetooth® Media devices, one Bluetooth landline phone, Line-In audio, and two remote microphone options), allowing a patient to easily determine which audio source is currently active. To turn on audio streaming from a particular audio source, the patient just presses the audio source button on the screen, highlighting the button. To turn off audio streaming, the patient presses the audio source button again, un-highlighting it. Built-in smart logic automatically removes a button from the Streaming screen if an audio source is no longer available. For example, if a patient detaches the Line-In cable, its audio

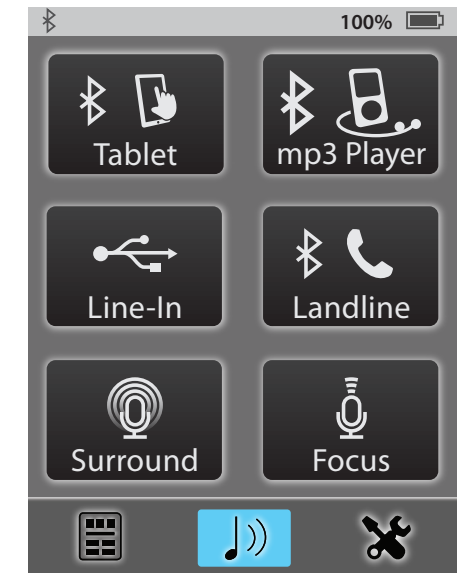


Figure 2: The Streaming screen displays all the available audio inputs and highlights the active source (for example, Line-In).

source button would be removed from the Streaming screen. There are no longer explicit "Start" or "Stop" buttons.

SurfLink Mobile 2 now contains an Advanced Setup screen, which streamlines the initial setup process for professionals. Professionals can easily sync hearing devices, change language, customize the remote control screen layout, and activate or deactivate specific functionality. Integrated smart logic automatically removes, adds, or adjusts screens and functionality based upon the selections. For example, if a patient only wants to use the remote control and remote microphone functionality, the professional can deactivate Bluetooth Media and Phone Calls. All the Bluetooth functionality and buttons will be removed, simplifying the patient's experience.

Based on market feedback, SurfLink Mobile 2 incorporates the following new features:

- **NO-LOOK ANSWERING:** This allows a patient to answer incoming cell phone calls by pressing anywhere on the SurfLink Mobile 2 display. In essence, the entire display becomes a large button.

- **SETTINGS LOCK:** When active, this feature makes it more difficult for a patient to access the Settings area and make unintended changes. The professional wants customization options, but the patient may find them confusing.

- **RESET TO FACTORY SETTINGS:** For professionals that demonstrate the same SurfLink Mobile 2 to multiple patients, this feature quickly erases all synced hearing devices and all paired Bluetooth devices, along with resetting any settings/features that were altered after leaving the factory.

- **ACTIVE BLUETOOTH CONNECTION WITH A CELL PHONE DISPLAYED ON TASKBAR:** This allows a patient to easily determine if he or she has zero, one or two active Hands-free Profile Bluetooth connections (typically, these would be cell phones) with SurfLink Mobile 2.

- SurfLink Mobile 2, when used in combination with 900sync Technology in Z Series hearing aids, is less susceptible to wireless interference and delivers more reliable wireless performance. An upgraded original SurfLink Mobile used with non-Z Series hearing devices will only experience minor wireless interference benefits.
- SurfLink Mobile 2 provides an eight-hour streaming battery life (with up to 120 hours of standby time), as it includes a larger capacity battery. The original SurfLink Mobile (with four-hour batteries) with updated firmware will experience up to a 20 percent improvement in its current streaming battery life.

features like Auto Experience Manager, Acuity Directionality, and Stream Boost, patients can experience amazing sound quality for more time in more locations and with fewer interruptions. Not only does Z Series deliver an improved experience, but it also contributes to greater customer satisfaction.



To upgrade to version 2.0 firmware, go to starkeyhearingtechnologies.com/update/cped/

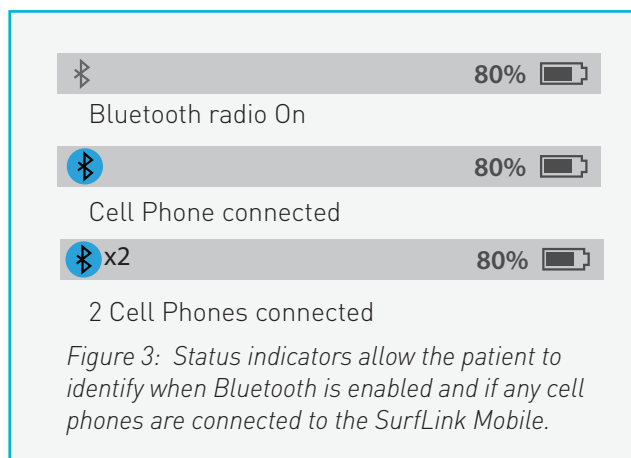


Figure 3: Status indicators allow the patient to identify when Bluetooth is enabled and if any cell phones are connected to the SurfLink Mobile.

The newest user interface firmware (version 2.0) is fully compatible with the original SurfLink Mobile. For the best wireless system performance, the professional should ensure both the patient's SurfLink Mobile and hearing devices have updated firmware. The features and functionality will be the same as Z Series plus SurfLink Mobile 2 with a few notable exceptions:

CONCLUSION

Consumers are savvier about technology and increasingly more demanding. New microphone covers on standard products ensure that Z Series products will stand up to rough environmental conditions, without degradation in hearing aid performance. With integrated 900sync Technology, Z Series hearing devices offer improved wireless connectivity and performance. SurfLink Mobile 2 provides an updated user interface and twice as much battery life. When combined with new