AutoSense OS and Roger Technology: A perfect match for all listening needs

Disclosure: ASHA CEU Requirements

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Manager, Clinical Training

I have a financial relationship to disclose:
- Employee of Phonak who receives a salary

1. AutoSense OS
2. Venture Product Line
3. Roger
Factors that were most strongly associated with positive changes in IOI-HA scores were:
- greater satisfaction with the hearing aid
- fit/comfort
- clarity
- comfort with loud sounds
- greater satisfaction in conversations with one person, in small groups, in large groups, and outdoors

Hickson L, Clutterbuck and Kahn 2010

A hearing solution must ...

The new Venture platform
Our response to life’s complexity and need for performance

Double the processing capability
VENTURE TECHNOLOGY
30% less power consumption

Evolution of the Digital Signal Processor (DSP)

The Hardware: Venture chip
- Reduction in power consumption when streaming (up to 30%)
- New analog to digital processor
- More non volatile memory

<table>
<thead>
<tr>
<th></th>
<th>Palio</th>
<th>Core</th>
<th>Spice-Quest</th>
<th>Venture</th>
</tr>
</thead>
<tbody>
<tr>
<td>SaviaArt</td>
<td>Ewila</td>
<td>Ambra/Boiero</td>
<td>Audeo V</td>
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<tr>
<td>Transistors</td>
<td>7.5 million</td>
<td>8 million</td>
<td>16 million</td>
<td>45 million</td>
</tr>
</tbody>
</table>
AutoSense OS

Unmatched accuracy, precise performance, for every sound environment.

The evolution of automation technology

AutoPilot

SoundFlow

AutoSense OS
AutoSense OS: accuracy and precision at its most powerful

Precision unlocks the potential provided by accuracy

AutoSense OS
Over 200 distinct settings in 1 unique operating system

AutoSense OS selects the best settings to maximize hearing performance automatically so that your clients don't have to.


AutoSense OS selects the best settings to maximize hearing performance automatically so that your clients don't have to.

How successful are hearing aid users at switching hearing aid programs?

- Do Experienced Hearing Aid Users Know How to Use Their Hearing Aids Correctly?
  - JAMA 18, 69-76
  - Jamie Desjardins and Karen Doherty, Syracuse University (2009)

Figure 6. The percentage of test clients using head movements for each PHABETS option. 1 = no anxiety, 5 = extreme anxiety.
AutoSense OS

Over 200 distinct settings in 1 unique operating system

AutoSense OS selects the best settings to maximize hearing performance automatically so that your clients don't have to.


www.phonakpro.com/evidence

How successful are hearing aid users at switching hearing aid programs?

- Do Experienced Hearing Aid Users Know How to Use Their Hearing Aids Correctly?
  - JAAA 18, 69-76
  - Jamie Desjardins and Karen Doherty, Syracuse University (2009)

Figure 8. The percentage of test subjects using both hearing aids satisfactorily for each Phonak A-10/30 and A-10-30.
Goal
Comparison of manual and automatic selection of program in certain acoustical environments

Study Design
- 14 Experienced Subjects
- Phonak Audéo V90-312 RICs
- ASOS and 5 separate manual programs
- Subjects were tested in 4 listening environments
- Objective results via Göttinger Sentence Test
- Subjective results via questionnaire double-blinded

Settings
AutoSense (defaults settings)
- Speech in car
- Speech in Quiet
- Speech in Loud Noise
- Speech in Noise
- Comfort in Noise

AutoSense OS: Lübeck Study Scenes
Setup: Speech in Quiet
Setup: Speech in Noise
(Cafeteria Noise - 65 dB)
(Cafeteria Noise - 70 dB)
Setup: Speech in Loud Noise
(Cafeteria Noise - 65 dB)
Setup: Speech in Car
(Car Noise - 56 dB)
Objective Findings:
- The program selected by AutoSense OS provides better speech intelligibility in each noisy situation.

Subjective Findings:
- Differences more subtle than objective data would indicate.

Major Findings:
- Subjects mostly select a different program than the automatic algorithm (ASOS).
- The highest variance of selection appears to be in the "Car" situation.
- The program selected by the automatic system provides the best hearing performance.

Patient benefit: AutoSense OS will choose the most appropriate program for the listening environment.
AutoSense OS: “Starbucks Study”

Study Objective:
- Evaluate the true capability of AutoSense OS in challenging, real-world environments to determine if hearing aid users prefer a manual hearing aid program of their choice or the program selected by AutoSense OS.
- Determine if hearing aid users are able to understand speech better in their chosen manual hearing aid program or the program selected by AutoSense OS in real-world environment.

Study Design:
- 14 Subjects
- Phonak Audéo V90-13 RICs
- ASOS and 5 separate manual programs
- Subjects were tested in three listening environments:
  - Listening Loft
  - A Moving Car
  - Coffee Shop (AKA Starbucks)
- Objective results via IEEE
- Subjective results via questionnaire

Objective Results
- Significantly better performance in the AutoSense OS program than manual for Listening Loft and Car environments
- Strong trend towards AutoSense OS in Coffee Shop
AutoSense OS: “Starbucks Study”

Subjective Results
- Strong preference for AutoSense OS across all domains for all three listening environments

Conclusions:
- AutoSense OS is not only easy to use, but it is reliable and consistent in optimizing speech understanding as well as comfort and sound quality.

Patient benefit: Automatic functionality, hassle-free hearing.

A program structure to match listening environments and people’s needs

<table>
<thead>
<tr>
<th>AutoSense OS Programs</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calm</td>
<td>Optimal gain setting for speech understanding and listening comfort</td>
</tr>
<tr>
<td>Speech in Noise</td>
<td>Adapts and reduces noise from behind in real time</td>
</tr>
<tr>
<td>Speech in Loud Noise</td>
<td>Zooms in on single voice in diffuse noise environment</td>
</tr>
<tr>
<td>Speech in Car</td>
<td>Reduces broadband noise in car to create stable listening environment</td>
</tr>
<tr>
<td>Comfort in Noise</td>
<td>Actively reduces noise in environment for increased comfort in absence of speech</td>
</tr>
</tbody>
</table>
Adaptive Directional Beamformer

Beamformer maintains maximal gain reduction from directions of greatest noise sources

Comparison of Venture microphone modes

Real ear sound  UltraZoom  Fixed StereoZoom  Adaptive StereoZoom

AutoSense OS – Speech in Loud Noise (SPILN)/Auto StereoZoom

Timer starts & reaches >15s
StereoZoom is activated

Timer re-starts when 1 criteria drops out for 20s

BINAURAL Binaural VoiceStream Technology™

MONAURAL R L R L R L R L
Directional microphone validation

Setup#1
Speech in diffuse noise
(cafeteria babble noise)

Setup#2
Noise from the sides
(cafeteria babble noise)

Directional microphone validation – Directional Benefit

Version 1, diffuse noise

SRT benefit [dB]

P3 static StereoZoom
P4 adaptive StereoZoom
Adaptive Binaural StereoZoom (SZ)

Directional microphone validation – Directional Benefit

Version 2, noise from sides

SRT benefit [dB]

P3 static StereoZoom
P4 adaptive StereoZoom
Adaptive Binaural StereoZoom (SZ)
AutoSense OS
Comfort in Echo

How the echo is reduced

- Why is it important?
  - Negative effects of reverberation on amplification

- What is it?
  - Looks for “tails” and cleans up “pauses”

Signal

0.5s

Time span of early reflections

Time span of disturbing reflections

Time (s)

Comfort in Echo

EchoBlock reduces echo and provides listening comfort for patients in reverberant situations.
Comfort in Echo

EchoBlock reduces echo and provides listening comfort for patients in reverberant situations.
AutoSense OS – Speech in Car

- Speaker in Car 50%
- Speaker in Car is activated

• Speech in Car 30% or less for 40 seconds
  Program drops out

Car frequency response

- Red - calm
- Green - Speech car
Speech in Car

Mild HL group:
- 22% of Quest users understood "everything"
- 46% of Venture users understood "everything"

Moderate to Severe HL group:
- 78% of Quest users understood >/= half
- 98% of Venture users understood >/= half

Mild HL group:
- 22% of Quest users understood "everything"
- 48% of Venture users understood "everything"

Moderate to Severe HL group:
- 20% of Quest users reported "little to no effort"
- 80% of Venture users reported "little to no effort"
28% more subjects found listening in car EASY

Speech in car — listening effort

Mild HL group:
- 30% of Quest users reported "little to no effort"
- 50% of Venture users reported "little to no effort"
20% more subjects found listening in car EASY

Moderate to Severe HL group:
- 20% of Quest users reported "little to no effort"
- 80% of Venture users reported "little to no effort"
60% more subjects found listening in car EASY

AutoSense OS
Music
Music program information

<table>
<thead>
<tr>
<th>Venture Music Program</th>
</tr>
</thead>
<tbody>
<tr>
<td>High Input Limit</td>
</tr>
<tr>
<td>Input dynamic range</td>
</tr>
<tr>
<td>Compression</td>
</tr>
<tr>
<td>Directionality</td>
</tr>
</tbody>
</table>

AutoSense OS – Music

OR

Music & Audéo V: External benchmark study

Study setup:
- 5 competitor hearing aids set at default music program; 1 Audéo V with 4 settings (SR on/off, Bass boost on/off) and 2 Phonak Q devices in default music program
- Classical 1, classical 2, opera, jazz, pop, rock, rock live
- 15 participants, trained “expert ears”
- Moderate hearing loss, open dome fitting

Hearing aid recordings:
- Brüel & Kjær HA1s 4128c and stereo loudspeaker set up at calibrated level
- Recordings were prepared and compensated for ear canal and headphone frequency responses.
Music & Audéo V: External benchmark study - results

No significant difference with SoundRecover

Other manufacturers:

Phonak Venture Portfolio

<table>
<thead>
<tr>
<th>Model</th>
<th>Portfolio Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audéo V</td>
<td>Mild to moderate RIC portfolio</td>
</tr>
<tr>
<td>Bolero V</td>
<td>Mild to moderate BTE portfolio</td>
</tr>
<tr>
<td>Virto V</td>
<td>Mild to profound Custom portfolio</td>
</tr>
<tr>
<td>CROS II</td>
<td>Single-Sided Hearing Custom and BTE</td>
</tr>
<tr>
<td>Naída V</td>
<td>Severe to profound Custom and BTE</td>
</tr>
</tbody>
</table>

AutoSense OS in Venture
Phonak Audéo V
Unmatched accuracy, infinite precision, for every sound environment

Phonak Audéo V: Highlights

- 4 new models, all with program button
- Audéo V-10 wireless with Binaural VoiceStream Technology™
- New high-tech composite material
- Audéo V-13 with separate volume control and push button
- Tinnitus Balance in all Audéo V models

Fitting ranges for all Audeo V

- Existing receivers, domes, SlimTips and cShells
**Audéo V**

- All new designs
- New High-Tech Composite Housing
- Binaural VoiceStream Technology™
- Wireless programming
- Wired programming
- Push button
- Volume Control

**Phonak Bolero V**

The finest in performance and reliability

- Push button
- IP67
- 312 battery
- T-coil
- Trinitus Balance
- Tinnitus Balance
- Roger 18 receiver
- Push button & Volume

*Available Summer 2015*
Phonak Bolero V fitting ranges

- M: Mild to moderately-severe hearing loss, all audiometric configurations
- P: Mild to severe hearing loss, all audiometric configurations
- SP: Moderate to profound hearing loss, all audiometric configurations

Phonak Virto V
Built to perform. Customized for discretion.

Performance:
- Directional Microphones
- Binaural VoiceStream Technology™
- Venture Technology
- Wireless Accessories
- Tinnitus Balance Portfolio
- AOV

Discreetness:
- Floating Antenna™
- Smaller faceplate
- Smaller battery
- New push button design
- New volume control design
Volume Control and Push Button on all Customs

Virto V-10 NW O
Virto V-10 O
Virto V-10
Virto V-312
Virto V-13

Power levels to meet any hearing loss

Virto V Models
Virto V-10: Directional performance

Validation comparison: Virto V-10 vs. Virto V-10 NW O

Validation comparison: Virto V-10 vs. Virto Q-312
Subjective listening effort

First fit acceptance

Virto V

You won't find a hearing aid this small, capable of this much performance.
CROS II Custom
The smart solution for single-sided deafness.

Goal of CROS intervention

<table>
<thead>
<tr>
<th>Original CROS</th>
<th>Quest / CROS</th>
<th>Venture / CROS II</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overcome head shadow effect</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Restore sound awareness</td>
<td>✔️</td>
<td>✔️</td>
</tr>
<tr>
<td>Preserve pinna cues</td>
<td>✔️</td>
<td>✔️</td>
</tr>
</tbody>
</table>

CROS II Performance

<table>
<thead>
<tr>
<th>V90</th>
<th>V70</th>
<th>V50</th>
<th>V30</th>
</tr>
</thead>
<tbody>
<tr>
<td>StereoZoom (automatic)</td>
<td>StereoZoom (manual)</td>
<td>Omnidirectional Standard</td>
<td>Omnidirectional Essential</td>
</tr>
</tbody>
</table>

StereoZoom (automatic) | StereoZoom (manual) | Omnidirectional Standard | Omnidirectional Essential |
CROS II Styles

- Audéo V-312 housing
- IP57
- Push button

- Audéo V-13 housing
- IP67
- Push button and Volume
- Optional ear hook included

Phonak CROS II-312 Custom
- Push button
- BVST

Phonak CROS II-13 Custom
- Push button/VC
- BVST
- Ear hook optional

IEEE sentence performance in diffuse noise
CROS II Validation results

Battery consumption in days
12 hours of use per day

30% longer battery life than the previous CROS
Defining the power patient

By the Audiogram?

<table>
<thead>
<tr>
<th>Severity</th>
<th>0 – 60 dBHL, better ear</th>
<th>Able to hear basic sounds in quiet, significant difficulty understanding in noise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe</td>
<td>61 – 80 dBHL, better ear</td>
<td></td>
</tr>
<tr>
<td>Profound</td>
<td>81 dBHL or greater</td>
<td>Unable to hear and understand speech in quiet, understand speech in noise</td>
</tr>
</tbody>
</table>

The audometric ISO-values are averages at 500, 1000, 2000, 4000 Hz.

- Healthy hair cells
- Damaged hair cells

Defining the power patient

By the patient need?

- **Dependent** on technology for communication
- Natural sound quality and clarity
- Hearing in quiet, near field is a challenge – in noise and over far field seem impossible without technology
- Comfort and durability are given higher priority over cosmetics
- A hearing aid that can adapt to changing environments
What is the patient-centric solution approach?

A holistic approach

1. Hearing and listening needs assessment, including the situations
2. Full audiological assessment
3. Complete solution is recommended to the patient that aims to meet all listening and communication needs

- A complete solution is often more than just hearing aids, as there are limitations what hearing aids can do versus the needs of these patients
- Include a patient's whole life and that of his or her loved ones

Naida V Benefits

- Enhanced Hearing Performance
  - Improvement in high frequency audibility (with SoundRecover2)
  - Increased audibility with up to 11dB more output (with BroadbandBooster and xUP receiver)

- Increased confidence and reliability
  - 60% more robust with carbon reinforced housings
  - IP68 – water and dust resistant

- Smaller devices for more people
  - More power allows for broader fitting ranges in smaller devices (BroadbandBooster, xUP receiver)
  - 25% slimmer hearing aids

Phonak Power Portfolio: Naida V + Roger

- Naida V
  - Naida V-UP
  - Naida V-SP
  - Naida V-RIC

- Naida V + Roger
  - Naida V-UP Roger 10
  - Naida V-SP Roger 10
  - Naida V-RIC Roger 10
### Fitting ranges

<table>
<thead>
<tr>
<th>Configuration</th>
<th>Sensitivity</th>
<th>Feedback</th>
<th>Program Structure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Naida V IRC</td>
<td>Sensitivity</td>
<td>Feedback</td>
<td>Program Structure</td>
</tr>
<tr>
<td>Naida V OP</td>
<td>Sensitivity</td>
<td>Feedback</td>
<td>Program Structure</td>
</tr>
<tr>
<td>Naida V FP</td>
<td>Sensitivity</td>
<td>Feedback</td>
<td>Program Structure</td>
</tr>
</tbody>
</table>

### Naida V feature set

<table>
<thead>
<tr>
<th>Feature Set</th>
<th>Standard Features</th>
<th>New Features</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programs</td>
<td>Same program structure</td>
<td>Same program structure</td>
</tr>
<tr>
<td>Resonance 60</td>
<td>Resonance 60</td>
<td>Resonance 60</td>
</tr>
<tr>
<td>Resonance 80</td>
<td>Resonance 80</td>
<td>Resonance 80</td>
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<tr>
<td>Resonance 90</td>
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</table>

### Programs

<table>
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<td>Resonance 120</td>
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</tbody>
</table>
Speech understanding with the hearing aid alone

In the far field (more than 1.5 meters), advanced wireless microphones are required to provide optimal speech understanding, especially in background noise.
How can the SNR be enhanced in high noise conditions?

1. Bring the microphone to the source, cutting out the distance
2. Optimize SNR at the source with beam former – this very good SNR is key
3. Adaptively mix the wireless microphone signal with the ear level microphone of the hearing aid, by increasing the gain of the receiver when the ambient noise level becomes higher
4. Reduce the receiver gain if no voice is present

What technology can deliver all of this?

A history of firsts

<table>
<thead>
<tr>
<th>Year</th>
<th>Technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996</td>
<td>MicroLink</td>
</tr>
<tr>
<td>2000</td>
<td>MLx</td>
</tr>
<tr>
<td>2003</td>
<td>Multi-Frequency FM</td>
</tr>
<tr>
<td>2007</td>
<td>Dynamic FM</td>
</tr>
<tr>
<td>2009</td>
<td>Dynamic FM</td>
</tr>
<tr>
<td>2013</td>
<td>The first to use adaptive digital wireless transmission at 2.4 GHz</td>
</tr>
</tbody>
</table>

What is Roger?

Operates on 2.4 GHz band (ISM) with intelligent adaptive protocols

Allows for ultra-low acoustic delay and reliable broadcast

Universal
The complete solution

The evidence: speech recognition scores in noise and over distance

Dr. Linda Thibodeau
- University of Texas, Dallas
- Speech-in-noise testing

11 listeners using their own BTE hearing instruments
- Ages 16 to 78
- Randomized, blinded
- Different noise levels

15 normal hearing listeners (no hearing aids, no Roger)

Comparison of speech recognition scores between HI users with a Roger system and normal hearing listeners

Speech understanding at 5.5 m in various noise levels

- Roger
- Dynamic FM
- Traditional FM

- 54% improvement
- 33% improvement

% Correct

Quiet 50 55 60 65 70 75 80

Noise Level (dB(A))

N = 11
Speech understanding in noise - hearing aid wearers plus Roger versus normal hearing listeners

![Graph showing speech understanding in noise](image)

**The subjective evidence**

What the study participants actually said about Roger:

- Clear, I understood really good
- Even with background noise I could understand the speaker easily
- Very clear and crisp, comfortable noise
- Loved this! Easy to understand and background noise was significantly reduced

**Dr. Thibodeau on Roger**

"I was amazed by the performance of students who used Roger. They were able to hear and understand the speaker in noise levels that would not have been possible using previous FM system technology."

---

**Percent correct**

<table>
<thead>
<tr>
<th>Noise level (dB)</th>
<th>With Roger (N=10)</th>
<th>Normal hearing listeners (N=15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>62% better</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60</td>
<td></td>
<td></td>
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<tr>
<td>65</td>
<td></td>
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<tr>
<td>70</td>
<td></td>
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<tr>
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<td></td>
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<td>80</td>
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**Percent correct**

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<td></td>
<td></td>
</tr>
<tr>
<td>80</td>
<td></td>
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</tr>
</tbody>
</table>
Roger vs. Phonak RemoteMic

- While both Roger and RemoteMic can overcome the negative effects of distance on speech understanding, Roger provides some additional benefits:
  - Optimizes SNR at the source with beamforming directional microphones
  - Adaptively mixes the wireless microphone signal with the microphone of the hearing instrument by increasing the gain of the Roger receiver in noisy environments
  - Reduces the gain when no speech is present

**Difference in speech understanding**

Rogé Clip-On Mic vs. Phonak RemoteMic

Speech recognition (in %)

<table>
<thead>
<tr>
<th>Noise level (in dB(A))</th>
<th>Quiet</th>
<th>55</th>
<th>65</th>
<th>75</th>
<th>80</th>
</tr>
</thead>
<tbody>
<tr>
<td>Speech recognition</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Jace Wolfe, 2014, Wireless Microphone Comparison

Roger for Adults Portfolio
Roger benefits

Performance
- Sound Quality
- Speech understanding in noise and over distance
- Adaptive behavior
- Roger Directional

Ease of Use
- Simple - No programming required
- Automatic mic mode
- RogerReady
- No frequency planning - 2.4 GHz

Multi-functionality
- One device for everything
- TV/multimedia connectivity
- Wideband Bluetooth (Roger pen)
- Expandable multi-talker network

Design
- Discrete
- Cool design
- Appealing colors

Full Compatibility with Roger For Adults Portfolio

<table>
<thead>
<tr>
<th>Roger microphones</th>
<th>Roger receivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roger Pen 1.1 / Roger EasyPen</td>
<td>Design integrated Roger receivers</td>
</tr>
<tr>
<td>Roger Clip-On Mic</td>
<td>Roger X</td>
</tr>
<tr>
<td>Roger MyLink</td>
<td></td>
</tr>
</tbody>
</table>

Roger overview

- A discreet, wireless Roger microphone that delivers superior speech-in-noise and over distance performance. It’s the ideal solution for an all-inclusive listening experience including Bluetooth connectivity.
- An easy-to-use wireless microphone for one-on-one or group conversations, featuring full Roger speech-in-noise and over distance performance.
- A discreet and lightweight stand-alone microphone for a conversation partner, with industry leading speech-in-noise and over distance performance.
Roger Pen 1.1 and Roger EasyPen

The Roger Pen 1.1

- 75% increased range
- New LED concept
- New buttons
- Colored Bluetooth buttons
- Marking on Pen and docking station for correct insertion
- Bluetooth update

Bluetooth

- Roger Pen supports hands free and headset profile
- Accepting and declining phone calls
- Voice dialing
- Last number redial
- Transfer call between phone and Roger Pen
- Wideband audio supported (bandwidth 7 kHz)
- Up to 2 connected phones (Multipoint)
- Only one active phone call at a time
**LED**

- Increased LED intensity on Roger Pen by approximately 100%

<table>
<thead>
<tr>
<th></th>
<th>PREVIOUS</th>
<th>NEW</th>
</tr>
</thead>
<tbody>
<tr>
<td>Switching on</td>
<td>White</td>
<td>Green</td>
</tr>
<tr>
<td>On</td>
<td>White flashing every 5 s</td>
<td>Green flashing every 5 s</td>
</tr>
<tr>
<td>Airplane mode</td>
<td>White</td>
<td>Red</td>
</tr>
<tr>
<td>Bluetooth enabled</td>
<td>No LED</td>
<td>Blue</td>
</tr>
<tr>
<td>Connect</td>
<td>No LED</td>
<td>Blue blinking during connect</td>
</tr>
<tr>
<td>Secondary does not find primary</td>
<td>Red flashing</td>
<td>Red blinking</td>
</tr>
</tbody>
</table>

* Also available for original version with firmware upgrade

**Roger Pen 1.1 Buttons**

- Bigger buttons
- Improved tactile and haptic feeling
- Colored Bluetooth icons

**Docking station**

- Positioning indicators added to Roger Pen 1.1 and docking station
New Multi Talker Network functionality*

Roger Pen as primary in a multi talker network:
- Can now be use in all three modes (conference, interview, lanyard)
- Microphone modes are set by the automatic mode or can be selected manually

Sample use case: While a moderator presents using a secondary Roger Pen or Roger Clip-On Mic, the primary can be placed on the table to hear the questions from the audience.

Summary

<table>
<thead>
<tr>
<th>Improvement</th>
<th>Roger Pen 1.1</th>
<th>Roger Clip-On Mic 1.1</th>
<th>Original hardware with firmware upgrade</th>
</tr>
</thead>
<tbody>
<tr>
<td>75% more range</td>
<td>✅</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>New LED concept</td>
<td>✅</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>Better visible LED</td>
<td>✅</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>New buttons</td>
<td>✅</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>Colored Bluetooth buttons</td>
<td>✅</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>Muting on Pen and docking station</td>
<td>✅</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>Bluetooth improvement</td>
<td>✅</td>
<td></td>
<td>✗</td>
</tr>
<tr>
<td>Pen in automatic mode when connected with other mics</td>
<td>✅</td>
<td>✅</td>
<td>✗</td>
</tr>
</tbody>
</table>

The Roger EasyPen features

- Roger SNR improvement
- Automatic microphone mode
- Advanced directional microphone
- Mute function
- Easy connect function
- Audio input
- Multiple microphone network
- Discreet design
Automatic microphone modes for Roger Pen 1.1/Roger EasyPen

### Conference
- Orientation: horizontal
- Noise level: Quiet (<70 dB(A))
- Pickup distance: Up to 3m/10ft all around
- Signal processing: Beamformer

### Interview
- Orientation: in-conf
- Noise level: Noisy (>70 dB(A))
- Pickup distance: Up to 1m/3ft frontal
- Signal processing: Adaptive Beamformer

### Lanyard
- Orientation: vertical
- Noise level: All levels
- Pickup distance: 4m/13ft
- Signal processing: Adaptive Beamformer

---

How to use the Roger Pen 1.1 Manual Modes

- Hand-held or lanyard
- Interview style: Conference

---

Roger Clip-On Mic 1.1
How to use the Roger Clip-On Mic 1.1

• Roger microphone needs to be switched on first
• Instant broadcasting of audio signal when audio is played
• Microphones are muted
• Device remains in audio mode until cable is unplugged or Roger microphone is switched off

Listening to Multimedia via the Audio Cable

- Roger microphone needs to be switched on first
- Instant broadcasting of audio signal when audio is played
- Microphones are muted
- Device remains in audio mode until plug is unplugged or Roger microphone is switched off

Listening to multimedia via docking station

- Docking station included with Pen or Clip-On Mic
- Charging station
- Automatic detection of an audio signal (even when device is OFF)
  - Powers down if no audio signal for 45 seconds
  - No power down even during soft music
Design integrated Roger Receivers for Phonak hearing instruments

- All receivers are available in the same colors as the compatible Hi
- Roger 19 and Roger 18 are IP68
- Roger 16, Roger 15, and Roger 13, Roger 11 and Roger 10 are IP67
- Tamper proof option available for Roger 19, Roger 18, Roger 11 and Roger 10

Design integrated Roger receivers for CI speech processors

- Roger 17
- Roger 14

- Advanced Bionics Naida CI Q90
- Advanced Bionics Naida CI Q70
- Advanced Bionics Naida CI Q30
- Cochlear Nucleus 5 (CP810)
- Cochlear Nucleus 6 (CP910)

Universal Roger receivers

- Roger X
- Roger MyLink

- BTE’s and RIC’s with DAI (direct audio input)
- Streamers with 3-pin Euro-plug
- Any hearing system featuring a T-Coil
Roger X

- Roger X is the world’s smallest universal receiver at 0.83 cm³
- Compatible with BTEs, CIs, BAHAs, Streamers
- Roger X works fully automatically, no buttons, no programmer
- Operating Range 20m / 66ft
- Power consumption
  - Active mode: 3 mA

Roger MyLink features

- Volume control and on/off button
- Quick charging 80% in 1 hour, 100% in 2 hours
- Operating time: 10 hours
- Operating range: 20m / 66 ft
- Can also be used with headphones

Roger Focus

- Unilateral hearing loss
- Minimal hearing loss
- Auditory processing disorder
- ADHD
- Autism
- Dyslexia
Choosing a Roger System

- Phonakpro.com
- Roger Configurator
- Target Software

AutoSense OS and Roger: Bridging the Communication Gap

The Phonak portfolio covers all listening situations and communication needs in the near and far field.
Thank you