

EduMic

Remote microphone technology to support communication access



oticon
life-changing technology

Breaking down communication barriers

What is a remote microphone system?



What is a remote microphone system?

A remote microphone system (RMS) is any wireless audio transmission system designed to help a listener understand speech over distances, especially in noisy environments. Current RMS devices use digital modulation (DM) technology to wirelessly transmit the audio signal to the listener's hearing technology, improving the signal-to-noise ratio, and making it easier for the listener to hear and engage.

The term 'FM' System is commonly used to describe RMS in general; however, newer technology such as the Oticon EduMic uses digital modulation (DM) audio systems.

FM versus DM – what's the difference?

- FM is an analog process that uses carrier waves in the 72-76 MHz or 216-217 MHz range
- FM was the standard for classroom communication for many years but is no longer utilized in current RMS technology
- DM converts an audio signal to digital and uses carrier waves in the 2.4 GHz range
- DM utilizes proprietary, closed protocols developed specifically for RMS
- Protocols provide boosts for latency strategies to avoid interference and make the signal more robust

EduMic RMS benefits

EduMic RMS transmits the speaker's voice directly to the individual's hearing instruments, overcoming the challenges of listening at a distance and in background noise.

Where is a RMS used?

- Learning environments - classrooms, lecture halls, and general assembly
- During sports or other recreational activities
- During transport - in the car, bus, train or plane, allowing the listener more access to the speaker, no matter where they are seated
- Social settings such as events, restaurants, shopping centers, and coffee shops
- At work - in the office, on-site, off-site, out with clients
- Places of worship
- Connect to video game systems

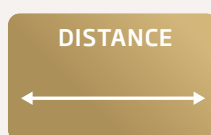
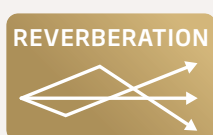
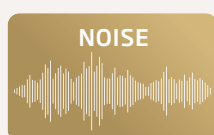
Easy to use and comfortable to wear

EduMic is the perfect partner for Oticon hearing aids in situations where noise, distance, and reverberation are a challenge. It uses the same OpenSound Navigator™ found in our hearing aids to analyze, balance and remove noise, and bring clearer sound to the listener.

Through implementation of OpenSound Navigator, EduMic delivers stable and clear access to a speaker's voice by analyzing the environment over 100 times

per second, balancing the sound scene and removing unwanted noise – even between words. EduMic also includes an innovative Wind Noise Management feature, allowing for use outside on windy days, improving sound quality.

EduMic is small, lightweight, comfortable, and connects directly to Oticon hearing aids without the need for any additional external receivers or devices.



Push button
ON, OFF, mute,
telecoil,
clear pairings

Telecoil
Access to loop
systems

Rotating clip
Attaches to lanyard
or clothes

Micro USB port
For charging

Microphone
with 20m (65 feet)

Jack input
3.5mm jack input for
external audio sources

FM connector
FM connector
for universal
receivers

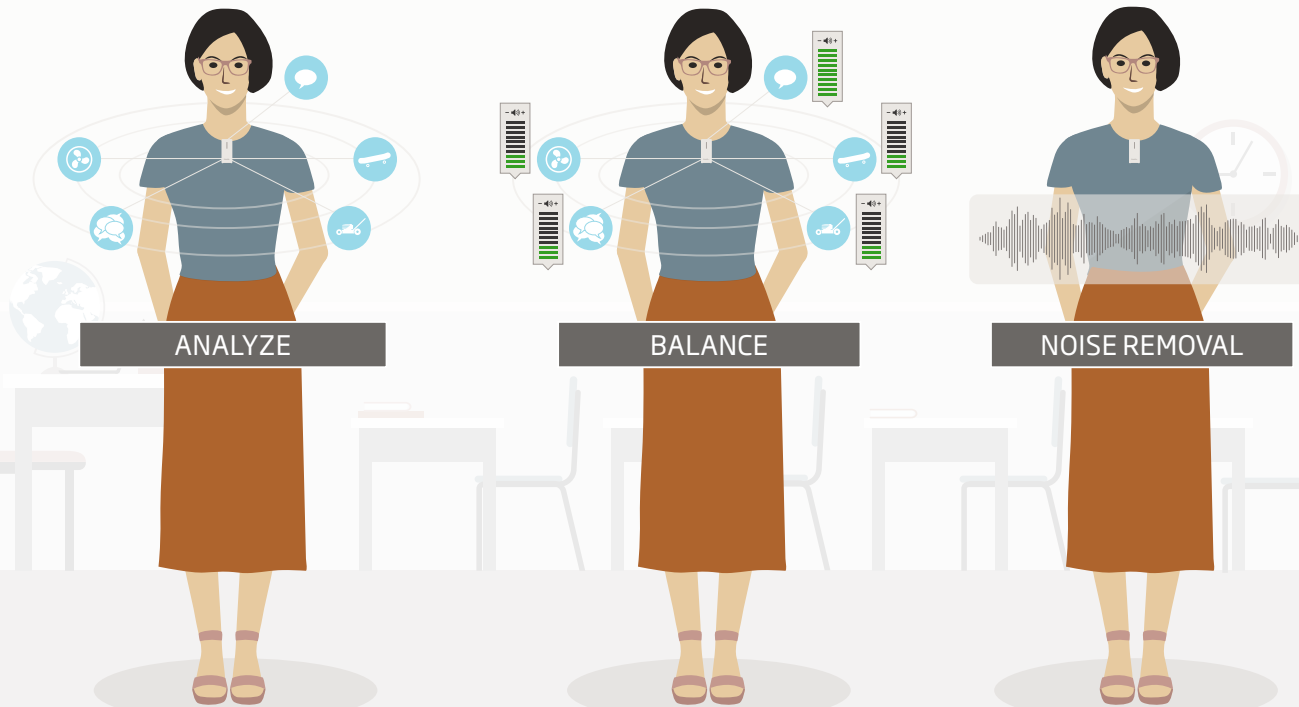


2.4 GHz

Battery Life	10 Hrs
Recharging Time	2.5 Hrs
Battery Type	Lithium-ion

OpenSound Navigator

The adaptive noise removal technology that powers EduMic



EduMic features Oticon's groundbreaking OpenSound Navigator technology that provides a full, balanced soundscape across all listening environments. It analyzes multiple dynamic noise and speech sources and gives the listener accurate information to naturally make sense of sound.

How it works:

- OpenSound Navigator analyzes the environment more than 100 times per second, examining each sound. The sounds are categorized as speech or noise by the Voice Activity Detector based on modulation. The level, position, and frequency characteristics of the sounds are also analyzed.

- Based on the data from the scan, individual sound sources are balanced so that the sound currently in focus (e.g. the talker) is clear, and other sounds are accessible, but not disturbing.
- The noise removal system attenuates noise rapidly and effectively – it can even attenuate noise between words to provide a clear and consistent connection to the talker.

Proven to improve speech understanding






At Oticon, research is the cornerstone of our product development. Internal and external studies are completed to ensure the features in our hearing technology support the needs of individuals with hearing loss.

Dr. Dawna Lewis, a researcher from Boys Town National Research Hospital, conducted a study with the Oticon EduMic and explored the classroom performance of students in noise and reverberation plus noise.

The study showed that using EduMic and hearing aids together significantly improves speech understanding compared to the use of hearing aids alone.

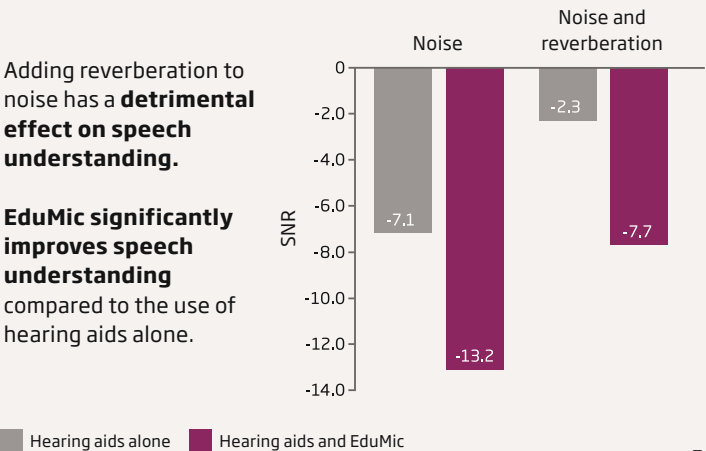
Lewis, D., Spratford, M., Stecker, G. C., & McCreery, R. W. (2022). Remote-Microphone Benefit in Noise and Reverberation for Children Who are Hard of Hearing. *Journal of the American Academy of Audiology*.

Student benefit with EduMic when listening in noise and reverberation

Boys Town National Research Hospital	AGE 7-18 of years	 Device configurations	
	TARGET Pediatric AZ-Bio sentences 60 dB SPL	 NOISE	 REVERBERATION Acoustic environment

Adding reverberation to noise has a **detrimental effect on speech understanding**.

EduMic significantly improves speech understanding compared to the use of hearing aids alone.



Improving communication access for young children



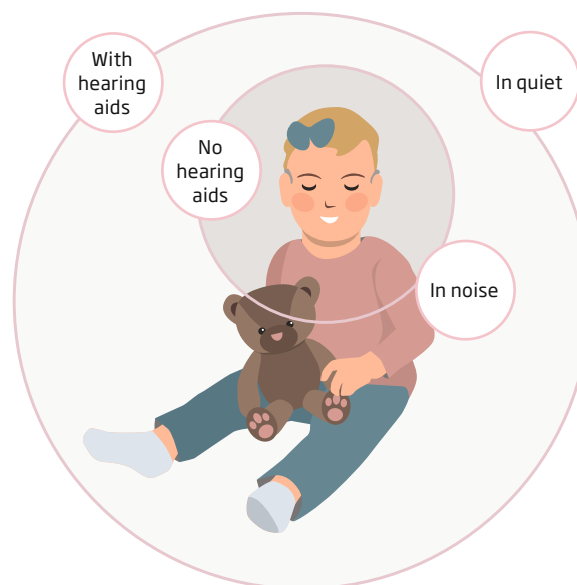
In everyday listening situations, children can typically understand conversational levels at three to six feet, and overhear conversations they are not a part of. This zone is called the listening bubble.

Young children with hearing loss have a reduced listening bubble, meaning that they are unable to hear conversations that are more than three to six feet away. This reduced listening bubble – and reduced access to outside conversations – can potentially impede the child's ability to increase their vocabulary or gain access to concepts that support their social development.

EduMic increases the listening bubble and provides access to more words

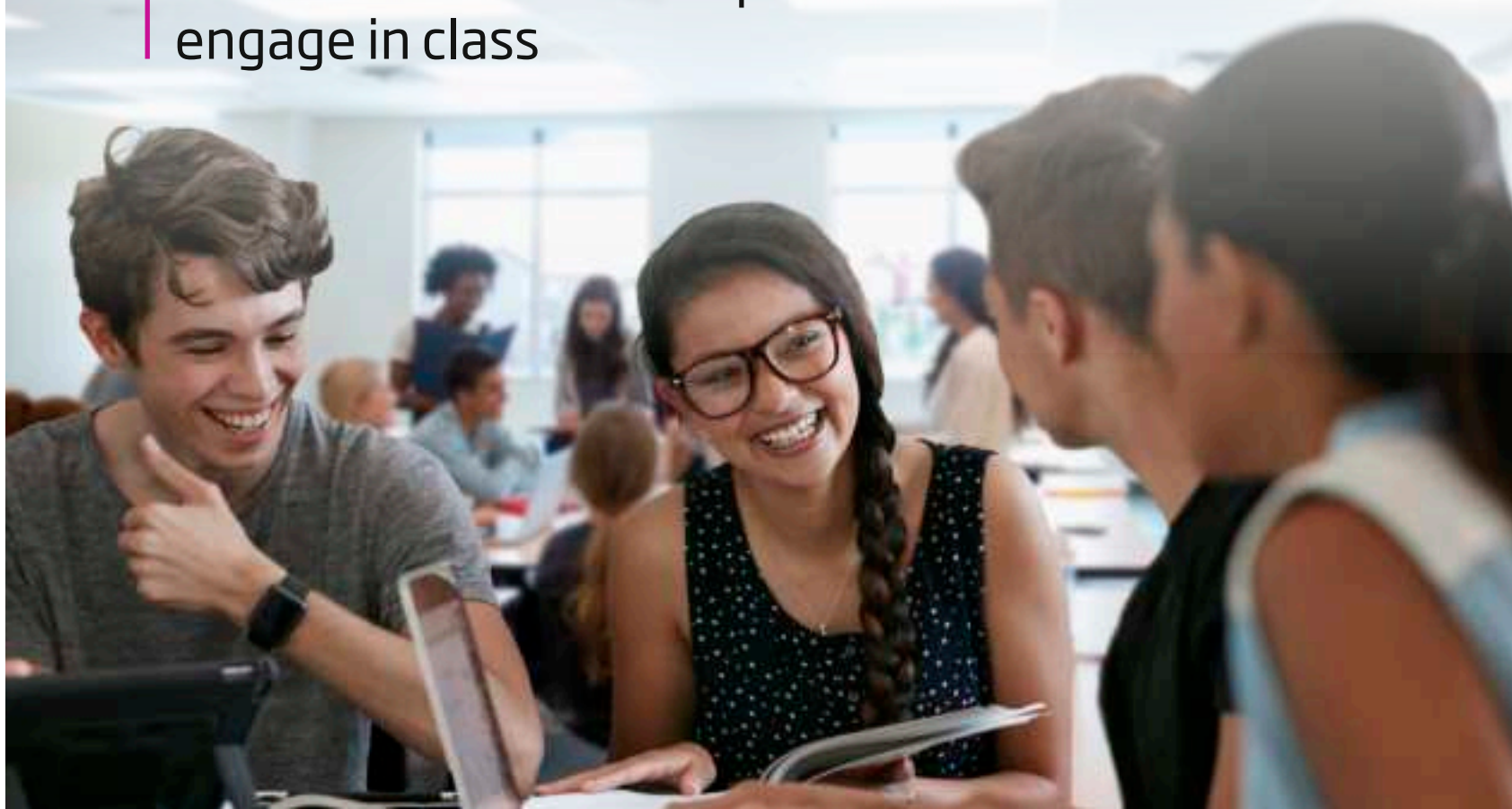
EduMic worn by the parent, caregiver, or educator can be used to expand the child's listening bubble. This increase can give the child access to the vocabulary and concepts they need to help them grow.

EduMic can also be used to enhance parent-child communication at home or while driving in the car. Research has shown that when parents use a remote microphone at home, their children had access to about 42% more words (Benitez-Barrera et al., 2018).



The Listening Bubble

Oticon EduMic. Participate and engage in class



EduMic overcomes communication barriers to provide enhanced classroom listening for students everywhere. Equipped with Oticon's BrainHearing™ technology, EduMic delivers excellent sound quality for Oticon hearing aid users.

EduMic supports remote learning

EduMic supports online classroom learning and communication through video conferencing calls. Use a 3.5mm aux cable to connect your EduMic to your PC, Mac®, Chromebook™, or Tablet, and join the lessons.

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Get connected with EduMic

EduMic easily connects to televisions, learning centers, interactive whiteboards, computers, and video game consoles. Any device with a 3.5mm aux or RCA output can be connected to EduMic with a single cable.



Build knowledge and develop new skills

For many individuals, attending a college, university, technical or trade school is an exciting time of life! And while it can be an exciting challenge to learn new skills, many learning spaces have reverberation, background noise, and large distances between the instructor and student. This creates a challenging listening environment, especially for individuals with hearing loss.

In these common situations, not all students will have clear, direct access to the instructor's voice. EduMic can help bridge the communication gap between student and instructor by wirelessly transmitting the instructor's voice directly to the student's Oticon hearing aids.

With EduMic, they can focus on what counts: learning and participating with their peers.

Oticon EduMic is the perfect workplace companion

Hearing challenges at work can affect a person's productivity and self-confidence. EduMic overcomes these challenges by transmitting a colleague's voice directly to the user's Oticon hearing aids. It is ideal when a person is speaking from far away, or when

there is background noise, like a meeting, business lunch, or other challenging listening environments. EduMic is worn by the talker and sends their voice directly to the user's Oticon hearing aids.



Comparing EduMic and ConnectClip:

Two great remote microphone options



The Oticon EduMic was designed to provide an easy 1-button remote microphone solution capable of transmitting to multiple Oticon 2.4 GHz compatible hearing aids. It also allows for connection to other audio devices via 3.5mm jack and includes a universal FM port.



The Oticon ConnectClip was designed as a multi-function device that transmits to Oticon 2.4 GHz compatible hearing aids, allowing for hands-free calls, volume control of the hearing aids, and a remote microphone mode.

	EduMic	ConnectClip
Size	Larger	Smaller
Battery Life	10 hours	8 hours
Chip Technology	Velox S™	Velox™
Multiple Sets of Hearing Aids	Unlimited	No
Mute function	Yes	Yes
Audio input	Yes	No
FM connectivity	Yes	No
User Interface	Ease of use focused	Multi-function focused
Protocol	Proprietary 2.4GHz Dual Frequency Transmission	Standard 2.4 GHz Transmission
Hearing Aid Remote Control	No	Yes
Telecoil	Yes	No
App Controls	Yes	Yes
Ideal client	<ul style="list-style-type: none">• For users who want an easy remote mic solution• For users who want to share the remote microphone transmission• For users who want telecoil functionality and access to teleloop systems when not available in their hearing aids• For users in need of a solution for an educational, extra-curricular, and social setting• For users who want an easy connection to other external audio as well as laptops / computers for activities like online learning, zoom meetings, etc.	<ul style="list-style-type: none">• For users who want an easy remote mic solution• For users who want to stream music or make hands-free calls from their smartphones• For users that want connectivity at home• For users who want to remotely control their hearing aids

Level the playing field with EduMic

From the big plays on the field to the big lifts in the gym, EduMic lets users hear the coach or trainer more easily, no matter where the game takes them. For outdoor sports, Wind Noise Management attenuates wind noise so users can always understand what is being said.

EduMic lets users with active lifestyles stay connected to the most important sounds of the game - indoors or outdoors.



EduMic is compatible with any Oticon or Oticon Medical hearing solution that uses 2.4 GHz technology. Pair your EduMic once, and you are ready to go! No extra parts to purchase, install or maintain!





LED indicator overview



Status indicator

A steady light indicates you are sending sound. A flashing light indicates that EduMic is muted.

○	White	Start-up
●	Flashing blue	Pairing in progress
●	Green	ON/microphone mode
●	Flashing green	Mute in microphone mode
●	Yellow	Jack/FM mode
●	Flashing yellow	Mute in jack/FM mode
●	Red	Pairings cleared
●	Magenta	Telecoil mode
●	Flashing magenta	Mute in telecoil mode



Power indicator

Charging time for full charging is 2.5 hours. A quick 30-minute charge during a break provides approx. 2.5 hours of use. When the power indicator flashes RED, there is approx. 2 hours of battery life remaining.

○	White	Start-up
●	Green	Fully charged
●	Flashing yellow	Charging
●	Flashing red	Battery low

Considerations for connecting RMS and Classroom Audio Distribution Systems (CADS)

Some modern classrooms utilize classroom audio distribution systems (CADS) to provide improved listening for students. The EduMic provides flexible wearing options.

Option 1

Teacher wears both CADS and RMS transmitter (preferred option)

- Transmitters should be worn with good separation on the body.
- Advanced features of both transmitters are available.

Option 2

- Teacher wears only CADS transmitter, RMS transmitter is connected to the CADS receiver/aux out.
- Optimize the connection by adjusting the aux out volume on CADs.

- Appropriate volume can be determined through verification using a hearing aid test box (Verifit). When verification is not available, the hearing care professional may begin by doing a listening check with the students' hearing aid technology and a functional listening evaluation.
- Determination of volume setting is completed once and is consistent for each manufacturer of CADS.
- While newer CADS systems offer microphones with adaptive features, advanced features of RMS are not available when connected to CADS. Evaluation with and without advanced features of RMS are important for measurements to determine viability of each set up.
- A student functional listening check is always recommended.



Optimizing all your audio connections

Evaluating your audio connections with your remote microphone system (RMS) is crucial for optimal student listening.

Why is it important to consider RMS and audio connections?

Consumer devices have a variety of different internal processes designed to manage sound. Most aux outputs on consumer electronics (e.g. laptops) were designed for connections such as headphones.

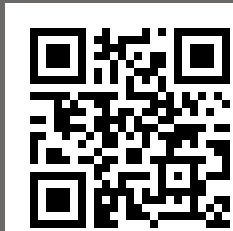
How can I assess my RMS and audio connection?

1. Connect your RMS system to the aux (headphone jack) to small electronic/media device
2. Connect the hearing aid to listening stethoscope
3. Enable and listen to an active sound source (e.g. YouTube video)
4. Adjust the aux volume (where available, otherwise – general volume on the consumer device) to a level where sound is comfortable and clear.

How can I assess the quality of my RMS and audio connection with the student?

1. Connect your RMS to the aux (headphone jack) to small electronic/media device
2. Have the student take their usual position in the classroom
3. Enable an active sound source for the student to listen to
4. Have the student rate the sound quality (e.g. verbal or picture rating scale) and adjust aux volume (where available, otherwise - general volume on the consumer device) to a level where student describes sound as comfortable.
5. If you are connecting to a CADS system, performing a functional listening evaluation, before and after connection is recommended.
6. If available, RMS and CADS connection may be evaluated using hearing aid verification test box.

Watch the testimonial video!



From the classroom to a noisy kitchen during mealtime, 6 year old Gabby hears her parents, her teachers, and the world around her more clearly than ever with the support of the Oticon EduMic.

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