EduMic
Remote Microphone System

Promoting participation, engagement, and inclusion for children and teens.

EduMic

oticon
life-changing technology

An introduction to remote microphone systems

What is a remote microphone system?

A remote microphone system is any wireless audio transmission system designed to help a listener understand speech over distances, especially in noisy environments. These RMS devices use either frequency modulation (FM) or digital modulation (DM) technology to wirelessly transmit the audio signal to the listener's hearing technology, improving the signal-to-noise ratio.

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

FM versus DM - what's the difference?
- FM is an analogue 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 from analogue to digital and uses carrier waves in the 2.4 GHz range.
- DM utilizes proprietary closed Bluetooth® protocols developed specifically for RMS.
- Protocols provide boosts for latency, strategies to avoid interference, and make the signal more robust.

What are the benefits of RMS?

RMS transmit 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 RMS used?
- Education settings – classrooms, lecture halls, and general assembly
- During sport or other recreation activities
- In the car, allowing the listener more access to the speaker, no matter where they are seated
- Social settings such as restaurants, shopping centers, and coffee shops

Why choose EduMic?

When noise, distance, and reverberation become challenging, EduMic is a vital partner to hearing aids. EduMic uses the same innovative technology found in our hearing aids to analyze, balance, and remove noise.

It delivers stable and clear access to a speaker's voice by continuously monitoring the environment and removing unwanted noise – even between words. EduMic also includes Wind Noise Management, allowing for use outside – without a reduction in sound quality. EduMic is tailored to the user's needs of discreetness and comfort and does not require any external receivers.

Teachers prefer Oticon EduMic over Phonak Roger
Results from our Teacher Usability Study* comparing the EduMic to the Roger Touchscreen found that:

- 85% of teachers perceived that the EduMic looks better and is more discreet
- 85% perceived the EduMic to be very comfortable to wear compared to Roger Touchscreen, which is heavier and bulky
- 79% perceived that EduMic is very easy to use, whereas 39% of Roger Touchscreen users reported user difficulty

2.4 GHz

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

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

Microphone
with 65 ft range

Telecoil
Access to loop systems

Jack input
3.5mm jack input for external audio sources

Rotating clip
Attaches to lanyard or clothes

Micro USB port
For charging

FM connector
FM connector for universal receivers

* Gordey, D.W., & Rumley, J. (2019). Enhanced learning with EduMic [White paper]. Centre for Applied Audiology Research, Oticon.

How is the EduMic different from the ConnectClip?

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	No
Audio input	Yes	No
FM connectivity	Yes	No
User Interface	Ease of use focused	Multi-function focused
Bluetooth®	Proprietary 2.4 GHz Dual Frequency Transmission	Standard 2.4 GHz Transmission
Hearing Aid Remote Control	No	Yes
Telecoil	Yes	No
On App Controls	Yes	Yes
Ideal client	• 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 outside of their hearing aids • For children 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.	• 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

How is the EduMic different from other manufacturers?

Oticon EduMic: The EduMic uses dual frequency transmission where two signals are sent on different carrier frequencies to avoid interference.

Phonak Roger: The Roger uses adaptive frequency hopping where transmission remains on a given frequency for a short time, and if interference is detected, the data will be re-sent later, when it "hops" to a different frequency.

1. Transmission Technology

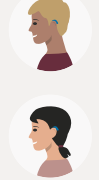|	EduMic	Roger Touchscreen	Roger Select
Transmission Method	2.4 GHz Dual Frequency Transmission	2.4 GHz Adaptive Automatic Frequency hopping	2.4 GHz Adaptive Automatic Frequency hopping
Audio Bandwidth	150Hz – 10kHz (telecoil mode 400Hz- 9kHz)	100Hz – 7.3kHz	100Hz – 7.3kHz
Transmission Range	65 feet	65 feet	33 feet (typical) 65 feet (ideal conditions)

2. Sound Quality

	EduMic	Roger Touchscreen	Roger Select
Signal Processing & Speech Clarity	OpenSound Navigator™ OpenSound Optimizer™ Wind Noise Management	Multi-Beam Technology (3 mics)	Multi-Beam Technology (3 mics)
Audio Input	3.5mm jack	3.5mm jack	Analog via micro-USB socket

3. Design

	EduMic	Roger Touchscreen	Roger Select
Discreetness	Contoured modern design, relatively small	Larger smartphone type design	Round with 2.17" diameter and 0.46" width
Wear Options	On clip or on lanyard	Can only be worn with lanyard	Table use or worn around neck with lanyard. No clip option
Weight & Size	36g, H66mm x W30mm	94g, W55 x H104mm	28g, W12 x H55mm
External Receivers Required	No	Yes	Yes

Note: One of the key benefits of the EduMic is that it offers one of the widest bandwidths in a remote transmitter.

Choosing the right device

This guide helps you select the best configuration that matches your student needs when using EduMic and other RMS and CADS systems.

EduMic Configurations

Scenario 1
Oticon Play PX
Oticon Xceed Play
Oticon Opn Play

Scenario 2
Oticon Sensei

Oticon Play PX
Oticon Xceed Play
Oticon Opn Play

Scenario 3
Phonak hearing aid

Oticon Play PX
Oticon Xceed Play
Oticon Opn Play

Scenario 4
Phonak hearing aid

Oticon Play PX
Oticon Xceed Play
Oticon Opn Play

Scenario 5
Phonak hearing aid

Oticon Play PX
Oticon Xceed Play
Oticon Opn Play

Scenario 6
Oticon Play PX
Oticon Xceed Play
Oticon Opn Play

EduMic connects to room hearing loops

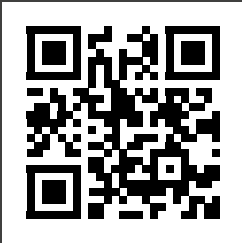Helping hearing aid users reconnect with the community around them.

Hearing loops are audio induction systems that are installed within rooms, emit a magnetic signal, and offer those with hearing technology and telecoils an opportunity to hear speakers who are wearing the audio system's microphones.

EduMic is the only remote microphone transmitter that can connect to room hearing loop systems.
For those who wear Oticon hearing aids on the Velox and Polaris™ platform, and do not have a telecoil, the Oticon EduMic remote microphone system can help.

EduMic has a telecoil mode designed to receive direct access to room hearing loop systems. These systems transmit signals to hearing aid users and they are found within community spaces like cinemas, places of worship, and lecture rooms.

EduMic + Oticon ON app

Streaming and environmental sound control via the Oticon ON app

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Six-year old Gabby and her EduMic. Watch the 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.

Optimizing audio connections

Evaluating your audio connections with your remote microphone system (RMS) is crucial for optimal student listening. Classroom audio distribution systems (CADS) may also be present in today's classrooms. Understanding how the RMS and CADS may be used together is important.

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 to the aux port (headphone jack) on the electronic/media device.
2. Connect the hearing aid to a 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 port (headphone jack) on the 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 the student describes sound as comfortable.
5. If you are connecting to a CADS, performing a functional listening evaluation before and after connection is recommended.
6. If available, RMS and CADS connection may be evaluated using a hearing aid verification test box.

Verification of RMS and CADS
1. Set up the hearing aid in the test box verification system and run a S-REM average speech curve 'w'.
2. Remove the hearing aid from the test box (still coupled) and pair the RMS to the hearing aid.
3. Place the RMS in the test box and run an average speech curve again.
4. Remove the RMS from the test box and plug it into the aux port of CADS system.
5. Place the CADS microphone in the test box and run average speech curve.

Note: For CADS that use infrared technology, do not close the test box fully as the lid will block the signal.

Note: Curves should be transparent and look very similar. If the final curve that measured the CADS connection is different, adjust the aux volume until you achieve transparency. Once you have found the proper aux volume settings for a specific RMS and CADS system, this setting will be the same for other systems using the identical set up.

Considerations for connecting RMS and CADS
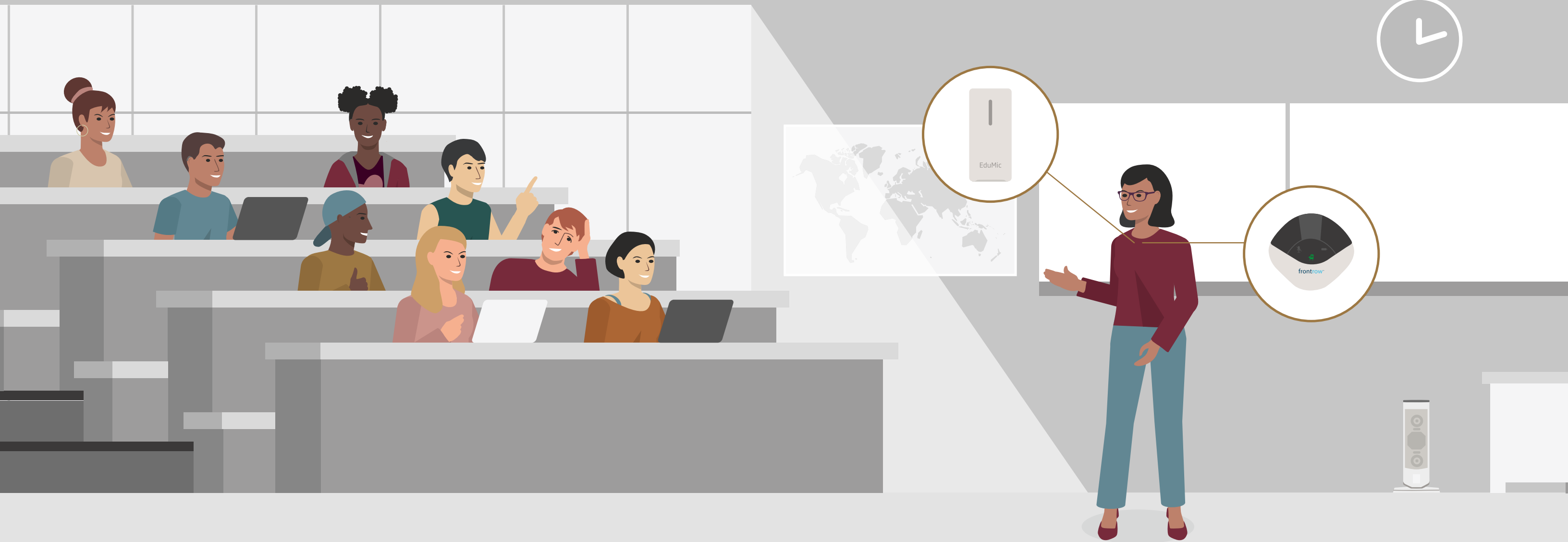
Option 1

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 the 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 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.

Frequently asked questions

Q Does connecting a RMS and CADS degrade the speaker's voice? Does connecting a RMS to a TV or laptop degrade the sound?

A There currently is no published research on signal degradation when connecting a RMS to external audio sources. We recommend evaluating each system connection with a listening check and a student functional listening evaluation.

Q When connecting RMS to a CADS, what is the impact to students when advanced features in the RMS are not available?

A Student performance for speech understanding may be variable. A functional listening evaluation comparing performance with and without advanced features is recommended.

Q When a RMS system is connected to an external classroom audio source (CADS, laptop, TV), is there an alteration in the frequency response of the RMS?

A Verification of current RMS connected to current CADS has shown, when the CADS aux output volume has been set correctly, the frequency response is maintained.

Q What does "Verification of RMS and CADS mean?

A Using your hearing aid test box, you can measure the transparency of your RMS when it is connected to the aux output of the CADS.

Q Is there current research available on the connection of CADS and RMS?

A No, the last evaluation was a project discussed in a field study news article completed in 2013, looking at the performance of Phonak Inspiro RMS connected to fixed, non-adaptive CADS (Mulder, 2013).

Q What new advancements have been made in CADS technology?

A Many of the current CADS technology (e.g. Front Row Juno) utilize adaptive features in their transmitters.

EduMic can support learning – **everywhere**

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

Family	Ear-level option	Telecoil	EduMic
Oticon Play PX			
miniBTE R or miniBTE T		●	●
miniRITE R or miniRITE T		●	●
Oticon More™			
miniBTE R or miniBTE T		●	●
miniRITE R or miniRITE T		●	●
Oticon Zircon			
miniBTE R or miniBTE T		●	●
miniRITE R or miniRITE T		●	●
Oticon Opn Play, Oticon Xceed Play, and Oticon Xceed			
Opn Play BTE PP or Xceed Play or Xceed BTE SP and UP	FM battery door + FM10	●	●
Opn Play miniRITE R or miniRITE T		●	●
Opn Play miniRITE			●
Oticon Opn S™ and Oticon Opn™			
Opn S and Opn BTE PP	FM battery door + FM10	●	●
Opn S and Opn miniRITE R or miniRITE T		●	●
Opn S and Opn miniRITE			●
Oticon Ruby and Oticon Siya			
Ruby and Siya BTE or BTE PP	FM battery door + FM10	●	●
Ruby and Siya miniRITE R or miniRITE T		●	●
Ruby and Siya miniRITE			●
Other			
Ponto 4 or later			●
Ponto 3, P, SP	With Streamer Pro		
Sensei 13BTE / SP	With FM9		●
Inuim Sense Power Plus	With FM10		●

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