SCOLA™ FM communication system

TUNED IN ON LIFE
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Being on the same wavelength as your peers is a prerequisite to leading an inspired and successful life.

THE COMBINATION OF an FM communication system and a high-quality hearing aid gives hearing impaired people the necessary edge when clear hearing is critical. From preschool to university, and through the numerous social situations that make up life, the uniquely flexible SCOLA™ FM system will help them stand out in their own right.

STRAIGHT TALK BY WIDEX

It is our mission, through originality, perseverance and reliability, to develop high quality hearing instruments that give people with a hearing loss the same opportunities for communication as those with normal hearing. A Widex FM communication system will ensure additional ease of listening for the hearing aid user, delivering a clear signal in acoustically challenging situations. This is what we call “Straight talk by Widex.”
I DON’T WANT TO SPEND A LOT OF TIME SOLVING TECHNICAL ISSUES. I’M NOT A TECHNICIAN.

The devices must be able to withstand the wear and tear of everyday use.

THE SYSTEM MUST BE AS INVISIBLE AND INTUITIVE AS POSSIBLE – OR I WON’T USE IT.

The SCOLA™ FM system is our answer to the many wishes voiced by audiologists, teachers, hearing aid users and their families.

IT’S IMPORTANT FOR ME TO KNOW THAT THE SIGNAL IS ACTUALLY REACHING THE HEARING AID.

TODAY, TEACHING SITUATIONS ARE MORE COMPLEX. SO FOR ME, FLEXIBILITY IS CRUCIAL.

THE SYSTEM MUST BE EASILY ADAPTABLE TO ALL HEARING AIDS.

WE HEAR YOU

The SCOLA™ FM system is our answer to the many wishes voiced by audiologists, teachers, hearing aid users and their families.

In many of life’s situations, being in the now and being able to interact is a big challenge for hearing impaired people. In these situations an FM system can be extremely helpful – but only if it is simple enough to be operated by anyone and sophisticated enough to actually make a difference.

Scola is a complete system created to accommodate most of the varied listening challenges that hearing aid users will encounter in both their educational and private lives. The SCOLA system consists of three communication units, which together make up a powerful FM communication solution: the SCOLAfex receiver and the SCOLAt teach and SCOLAtalk transmitters.
THE TEACHER IS IN CONTROL

Freedom and control go hand in hand when combining SCOLATEACH and SCOLAFLEX in the classroom.

FM SYSTEMS OFFER hearing impaired children the freedom to participate freely and naturally in educational situations. With SCOLA this freedom does not come at the expense of control. Using the intuitive menus of SCOLATEACH, the teacher can easily set up and monitor the functionality of the system.

WITH THE INTUITIVE menu system on the SCOLATEACH transmitter, the SCOLAFLEX receiver can be synchronised to the desired channel by the push of a button. Once the channels are aligned, the Teacher mode of SCOLATEACH enables the teacher to set and lock the operating controls on the SCOLAFLEX receiver to prevent tampering by the child. During the lesson it is also possible for the teacher to check that the channels are still aligned and if other transmission signals are interfering with the child’s FM reception.

ANYTHING THAT CAN BE DONE TO GROW THOSE IMPORTANT AUDITORY CENTRES OF THE BRAIN WITH THE “SOUND IMAGES” OF LANGUAGE EXPANDS CHILDREN’S OPPORTUNITIES IN LIFE.

Carol Flexer, Audiologist, Ph.D.
In the first 15 years of our lives we learn to understand by listening. Words are “sound images” that have to be taken in through the ears and connected to content by the brain. Years of language and life experience enable adults to reconstruct these images by “filling in the gaps” – when only parts are audible.

Research has shown that children generally require greater stimulus levels and better SNR than adults to discriminate between speech sounds – especially in noisy surroundings.

Early identification of hearing loss through newborn hearing screening, and consequently early amplification with modern hearing aid technology, helps infants to develop speech and language in a natural way – a key factor for further education, which is built on speech perception.

Children typically learn in classrooms with background noise and reverberation that interferes with speech perception. Optimising the SNR is crucial to getting a clear signal and the best learning circumstances. Personal FM systems optimise the SNR by up to 25 dB – thereby delivering superior speech perception performance in educational situations, regardless of hearing loss type.

Scientific studies indicate that, compared with adults, children need a better signal-to-noise ratio (SNR) to listen and learn.

Aligning the channel on the pupil’s receiver is simple. If more pupils are using SCOLAflex receivers, the teacher can set each individual receiver to the channel used by SCOLAtEach by sending a synchronisation signal from SCOLAtEach.

If a child seems to be daydreaming, the teacher can wirelessly check if the settings on the pupil’s SCOLAflex receiver are correct – without interrupting the lesson.

LEARNING IS A SENSIBLE MATTER

Today, FM transmission is widely used – not only for FM systems – but for all kinds of wireless equipment. Therefore the risk of experiencing interference is increasing.

This phenomenon is of course more common in special schools for hearing impaired children, where more than one FM system is in use. If interference noise occurs, the teacher can quickly scan for available channels using the Channel Tracer function of SCOLA teach.

The display of SCOLA teach will then show a list of available channels and indicate which channels are already in use. This makes it easy for the teacher to choose a free channel and synchronise the SCOLA/lex receivers in class accordingly.

PLUG AND PAY ATTENTION

SCOLA teach offers an easy-to-use Channel Tracer to ensure fast and easy detection of interference.

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SCHOOL CAN BE a very stressful experience for hearing impaired children if they have to struggle to understand every word the teacher is saying. Valuable energy, better used for understanding and learning, is wasted in the tiring process of identifying words by filling in the listening gaps. Consequently, hearing impaired children are often tired when they come home from school and must also use extra time to catch up.

THE EASE OF listening provided by a SCOLA FM communication system is the proven way to an optimised learning situation for hearing impaired children. Speech sounds are picked up near the mouth of the teacher, where reverberation and background noise do not have any impact on the clarity of the signal. The child receives a clear signal and can focus on learning.

LISTEN AND LEARN

- It is well documented that children with even a minimal hearing loss who do not use hearing aids are 10 times more likely to fail in school than children with normal hearing.
- In the first grades at school, where basic skills like reading and writing are taught, more than 75% of education is based on children's ability to listen and learn.
- In a normal classroom, noise and reverberation caused by pupils, outside sounds and poor room acoustics will often be as high as 75 dB SPL.

Anne Marie Thorpe, Ph.D., 4th World Paediatric Congress 2006
Both the speaker and the listener have full freedom of movement and need not be face to face to be heard and understood – even when they are several metres apart.

The FM switch on the SCOLAflex receiver enables the user to mute the hearing aid microphone and listen to the FM signal only. When the hearing aid is not picking up additional noise from the surroundings, the child is able to concentrate on the sounds picked up by the FM microphone.

GETTING THROUGH

The SCOLA FM system improves speech intelligibility in everyday situations where noise would otherwise make it hard to get in contact with a hearing impaired child.

Because of traffic or wind noise in the hearing aid microphones e.g. while biking, it can sometimes be difficult to get through to a hearing impaired child. Here, the SCOLA FM system ensures that crucial warnings and directions reach the child. The system is also suitable for other transport situations with lots of background noise, where it enables the parent to carry on a normal conversation with the child. Furthermore, the SCOLAteach and the SCOLAtalk transmitters can be connected to external audio sources like portable audio players and handheld game consoles to keep the child entertained while on the road.
To ensure proper acoustic transparency the signal from the SCOLA flex receiver is processed in the hearing aid.

This ensures that the same individual adjustment is applied to both the FM signal and the sound from the hearing aid’s own microphone. By adjusting the built-in gain control, the ratio between the signal from the receiver and the signal from the hearing aid’s own microphone can be balanced according to the recommended national guidelines. Together with the built-in compression algorithms, the SCOLA system optimises the input levels for various microphone positions:

- Face position: 85–90 dB SPL
- Lapel position: 80–85 dB SPL
- Chest position: 75–80 dB SPL
- Table position: 55–65 dB SPL

Balancing the speech signal
- Transparency between signals from the FM microphone and HA microphone at conversational input levels (65 dB)
- FM gain is adjusted to an advantage of 10 dB between the signal from the FM microphone (input level 80 dB) and the signal from the hearing aid microphone (input at 65 dB) in FM+M.
DESIGNED FOR FUTURE GENERATIONS

From elementary school to higher learning, SCOLA grows with new social and educational challenges.

KINDERGARTEN
- Noise floor up to 70-85 dB SPL
- Speech and language development is still in process
- Focus on developing grammatical language structures

SCOLA BENEFITS
- Optimised SNR in extremely noisy surroundings
- SCOLAflex can be locked to prevent tampering by child

ELEMENTARY SCHOOL
- Noise floor/background noise up to 70-75 dB SPL
- Focus on learning basic skills such as reading and writing
- 75% of all teaching situations are based on listening

SCOLA BENEFITS
- FM advantage of 10 dB
- Clear signal, independent of teacher’s position in classroom
- Interference control with Channel Tracer function

HIGHER LEARNING
- Noise floor normally below 65 dB SPL
- Focus on the content of information
- Interactive educational situations with more than one speaker

SCOLA BENEFITS
- Perfect ease of listening
- Team Teaching offers a clear signal from two FM microphones
- High flexibility with SCOLAflex multi-channel approach
- SCAN function for finding active transmitting channels
- Listen to FM+M or FM alone
- Channel Tracer and flexible channel management

ADULT LIFE
- Varying noise floor depending on situation
- Infinite range of different listening conditions
- Need for a highly personalised FM communication system

SCOLA BENEFITS
- Programmable, multi-channel FM-system ensures extreme flexibility
- Optimised listening conditions in a wide array of everyday situations
- Sleek, handheld SCOLAtalk FM transmitter
- Flexible SCOLAflex channel management and function settings

THE SCOLA FM SYSTEM is built to last. Each of the communication units has been designed to withstand the wear and tear of everyday use.

The menu-driven operation and programming of SCOLAteach, as well as the flexibility of SCOLAflex and SCOLAtalk offers plenty of possibilities for individual adjustment along the way.

TO FURTHER ACCOMMODATE future hearing aid technologies, SCOLAflex comes with a series of unique slide-on shoes. These have the look of integrated shoes and receivers, but unlike integrated receivers, the SCOLAflex receiver can also be used with future hearing aids as the child grows. And even though the SCOLAflex receiver has been specially designed for use with Widex hearing instruments, it can also be supplied with a small adaptor, allowing connection to any audio shoe with a three-pin europlug interface.
**SCOLAtalk**

**SLEEK, HANDHELD FM MICROPHONE**
- Multi-channel capability
- Variable directionality due to integrated, multi-microphone system
- Digital signal processing unit

**SCOLAteach**

**VERSATILE, PROGRAMMABLE FM TRANSMITTER**
- 3 different operation modes: User, Teacher and Professional
- Intuitive, menu-driven operation
- Multi-channel capability
- Wireless programming of SCOLAflex with read back function
- Synchronisation of channels, FM switch and Scan button function in SCOLAflex
- Channel Tracer – interference detection
- Two versions of SCOLAteach – with and without Team Teaching

**SCOLAflex**

**WIRELESS MINIATURE FM RECEIVER**
- Multi-channel capability
- Slide-on interface
- Wireless response to SCOLAteach
- Can be programmed wirelessly from SCOLAteach
TEAM UP WITH SCOLA

Using the SCOLAteach Team Teaching function allows the user to listen to two FM transmitters simultaneously.

THE TT VERSION of SCOLAteach incorporates a Team Teaching function, enabling the user to programme the built-in receiver in SCOLAteach. This makes it possible to relay an extra FM signal to the hearing aid — combining SCOLAteach with a team microphone such as SCOLAtalk.

This input is sent to the SCOLAteach, where the two microphone signals are combined and relayed to the receiver(s) — offering the user a clear FM signal from two different sound sources at the same time.
The SCOLAflex receiver delivers a clear FM signal from two different FM microphones to the hearing aid.

SCOLAtalk transmits to SCOLAteach.

The Team Teaching function in the TT version of SCOLAteach will relay the incoming signal from SCOLAtalk — or any other FM microphone — and transmit it along with the SCOLAteach signal.

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THE ART OF INTERACTION

When education leaves the classroom to explore real life, the Team Teaching function makes sure that the hearing impaired can follow.

Unconventional teaching situations can be a real challenge for hearing impaired people. But combining the input of SCOLAteach and SCOLAtalk with the microphones of the hearing aids will cover almost any situation. For instance, when visiting a museum the user will be able to listen to a guide as well as taking in the comments of her teacher and the other members of the group.
ADDING A PERSONAL TOUCH

Using the Professional mode allows audiologists to programme SCOLATeach and SCOLAFlex.

**SCOLATeach features**
- Enter and edit the user’s name
- Arrange individual channel list
- Arrange individual synchronisation settings
- Activate Team Teaching function (TT version only)
- Select / deselect SCOLAFlex response
- Beep-tone configuration

**SCOLAFlex features**
- Enter and edit the user’s name
- Set the ear location
- Arrange individual channel list
- Activate / deactivate Scan button
- Set FM switch function
- Set SCOLAFlex gain and squelch level
DON'T MISS A THING

The SCOLA FM system enables hearing impaired people to connect directly to multimedia equipment.

**COMBINING SCOLAf lex, SCOLAt each, and SCOLAtalk** enables the user to adapt to a wide range of social situations both in and outside school and work. Both the SCOLAt each and SCOLAtalk transmitters can be connected to various kinds of multimedia equipment — such as a TV, stereo or PC. This allows the hearing aid user to receive a clear and undistorted signal from the multimedia equipment without having to turn the volume up loud.
Advanced digital signal processing delivers increased directionality, even in the low frequencies, and a more natural sound quality.

SCOLAflex gets you closer to the sound source.

SCOLAtalk enables the user to participate actively in meetings and social situations.

SCOLAtalk is equipped with an advanced directional microphone system employing one omnidirectional microphone and four additional microphones to create directionality. This gives the user the possibility of choosing between different microphone modes to suit the situation. So no matter if it is a speech given from the end of a long dinner table or gossip shared by friends in a café, SCOLAtalk will make sure that not a word is lost.
**VARIABLE DIRECTIONAL CHARACTERISTICS**

Both SCOLAtalk and SCOLAteach can be used with different microphone configurations to match the specific hearing situation.

**SCOLAtalk — Built-in directionality**
- Omnidirectional: speech and other sounds are picked up from all directions.
- Directional: noise from the surroundings is attenuated to focus on speech from the front.
- Super-directional: highest directionality for severely noisy listening situations. The microphone has a directionality index as high as 8.4 dB.

**SCOLAteach — Endless microphone possibilities**
- Omnidirectional lapel microphone: SCOLAteach standard microphone. Picks up sound signals from all directions at chest level.
- Directional lapel microphone: worn at chest level, it attenuates noise from the surroundings to optimise speech from the front.
- Headset microphone: perfect for picking up a high quality speech signal independently of head movements and noise from the surroundings.
- Neck cord lavalier microphone: for wearing SCOLAteach comfortably around the neck. The microphone is integrated in the neck cord.
Even advanced hearing aids have some physical limits to their performance – especially in classrooms with poor acoustics and lots of noise.

Because of the relatively short distance between the hearing aid microphones, the directionality of an advanced, digital hearing aid cannot overcome the acoustic challenges of a typical classroom. Due to its size and the materials used for floors, walls and ceilings, a classroom usually generates a lot of reverberation. Just as early reflections of sound contribute to intelligibility, late reflections deteriorate intelligibility because they affect the temporal structure of the sound and “sound images” are smeared. In these poor acoustics – and with a relatively high noise floor – most hearing aid users will struggle to hear and understand the teacher.

Without SCOLA FM
SNR ~ 5 dB

With SCOLA FM
SNR ~ 15 dB

Near the mouth of the teacher the sound pressure is about 80 dB. As sound pressure is reduced by 6 dB with every doubling of distance from the source, the sound pressure will be approx. 65 dB when his voice reaches the child. Furthermore, the signal will be muddled by reflections from walls, floor and ceiling. If the noise level in the classroom is around 60 dB, the resulting SNR will only be 5 dB.

The SCOLAflex receiver is set to transparency around 65 dB. This means that the hearing aid user will experience the same sound level for 65 dB input in the aid, no matter if the signal comes from the hearing aid microphone or from the FM microphone. The teacher’s voice at 80 dB will be received at a level corresponding to an input signal in the hearing aid of 75 dB. This is due to the transmitter compression. Consequently, the FM advantage will be 10 dB and the child’s SNR will be up to 15 dB.
Along with the new SCOLA FM system, Widex introduces an intuitive, interactive FM guide for teachers, parents and hearing care professionals. The SCOLA simulator software can be installed on a PC and allows the user to virtually test the different functionalities of the system on-screen – accompanied by explaining text.

The simulator is operated exactly like a complete SCOLA FM system. Using the computer mouse, the user can enter and navigate the SCOLATEach menu system. It is possible to simulate the usage and programming actions such as changing transmitting channels, activating the Team Teaching function and all the other SCOLA options.

SCOLA FM SYSTEM – KEY FEATURES
• High user flexibility
• Great durability
• Multi-channel system with channel synchronisation
• Highly compatible and competitive