



## HUMANTECHNIK induction loop systems

In Australia, as in many countries throughout the world, 1 in 5 people, or 20% of the population have varying degrees of hearing impairment. This ratio is predicted to reach 25%, or over 5 million Australians in the very near future due to the effects of population aging and severe noise pollution.

None of us can wait for the time when we are given headphones to listen to a *live* concert, however, the scary thing is that this could happen with the threat of new OH&S issues surrounding the music industry.

Group Technologies has the product range and expertise to assist you in this market.

Contact us for further information and advice on dealership opportunities





## induction loop systems

### HUMANTECHNIK Induction Loop Systems

#### THE LEGISLATION

The Disability Discrimination Act (DDA 1992) while complex and detailed in its principles, is very concise in its stated position. In brief it clearly states that it is illegal to discriminate against those having any kind of impairment. This of course includes hearing impairment.

The act is directed toward all classes of building including educational facilities, hospitals, aged care facilities, conference venues and a host of applications, including transport. In simple terms failure to meet requirements of the act can lead to litigation against the property owner, or developer, or business principals. It is wide in scope while clear in intent.

The Act says that service providers may not discriminate against a hearing impaired person by refusing to provide a service or offering a service of a lower standard or on less favourable terms, on the grounds of their hearing impairment. Service providers must also make adjustments to the way in which they provide goods or services to enable hearing impaired people to access them.

Additionally, Building Codes Australia standard 2007 states that 80% of any public space containing Public Address Systems should cater for the hearing impaired. The Standard covering Hearing Impaired people is also covered under AS 60118.4

For many years now, there has been a tendency for Building Owners and Managers to overlook the needs of the hearing impaired, however, this is about to change with the adoption of the revised standard. This happened in the same manner as with access for the disabled to buildings of services.

The installation of Hearing Augmentation equipment, should, in theory, provide the best possible outcome when obtaining services for people using an Assistive Listening device (ALD)

In a majority of installations, the best possible system is not provided by those required to do so because:

- It is not considered a priority in budgeting
- It is *out of site – out of mind* as far as the Building Owners are concerned
- The end user is never considered with any degree of concern. This, in itself is discriminatory, as the person with the hearing impairment is as much entitled to hear, or obtain services simply and without discrimination as any other person.
- Quite often Consulting Engineers and Builders have limited understanding of the function of an Induction Loop System, or the Standard covering its installation and application.
- Furthermore the installer often has little or no knowledge of the principles involved when installing equipment and ensuring that it fully complies to required standards.



HUMANTECHNIK is a pre-eminent German manufacturer which began operations in 1984 and is dedicated to manufacturing Assistive Listening products for the hearing impaired.

HUMANTECHNIK manufactures three types of systems, these being Induction Loop amplifiers, RF and Infrared systems.

### HUMANTECHNIK choosing the right amplifier for the job

Reception / Counter:	Soundshuttle / LA-215 / LA-60
TV Rooms / Nursing Homes / Living Rooms:	LA-215 / PROLOOP C 9 / 10
Conference Rooms / Theatres:	PROLOOP C, PROLOOP DCC
Very Large Induction Loop Systems:	PROLOOP DCC or LOS system
Systems with Little Overspill:	LOS systems
Portable Induction Loop System:	Soundshuttle loop system kit

Loop position: In order to create a uniform magnetic field, the distance between the loop level to the normal listening level should be between approx. 1.2 and 2 metres.

The position and size of the loop can also be determined by the position of the listening area (often much smaller than the size of the room) or the position of the microphones as well as other technical equipment that affects the magnetic field. If possible, avoid using dynamic microphones in combination with induction loop systems. If they cannot be avoided, they must be positioned outside the loops. The distance between the loop and the dynamic microphone should be at least half the diameter of the loop.

Using a condenser or electret microphone usually produces better results with respect to interference or acoustic feedback. A microphone with a high-quality, insulated connection cord also generally reduces magnetic feedback. Reduce the area of the loop! The connection wire to the loop must be firmly twisted or closely parallel. Make a test installation. Always test the loop system to make sure that it is powerful enough, that the overspill does not cause any problems, etc.

Adjust the height of the loop (1.2 to 2.0 m) to provide for the greatest possible range with the smallest amount of overspill. Conducting materials, such as reinforced concrete, can increase or decrease the area covered by the loop. The magnetic field strength is often increased outside the loop, while it is decreased inside. This fact considerably increases the risk of acoustic feedback. In a new building, you should try to install an LOS system. The LOS system makes it more difficult for the current to connect with large metal objects.

Pay particular attention to metal frames. Do not fasten the loop to structural elements made of metal or similar objects

#### Recommended loop wire cross-sections:

Loop area Single loop(recommended cross-section)

300 - 600 m <sup>2</sup>	4.0 mm <sup>2</sup>
200 - 300 m <sup>2</sup>	4.0 mm <sup>2</sup>
150 - 200 m <sup>2</sup>	2.5 mm <sup>2</sup>
70 - 150 m <sup>2</sup>	1.5 mm <sup>2</sup>
< = 70 m <sup>2</sup>	1.5 mm <sup>2</sup>

*The cross-sections recommended here can be used for most induction loop systems. For special solutions, please contact Group Technologies.*





## induction loop systems

### SOUNDSHUTTLE compact, portable induction loop system: choice of three colours

The »soundshuttle« is a compact, portable induction loop system for applications over short distances, at reception desks, for example, at information counters or in sales areas.

Positioned between the people speaking to each other, the »soundshuttle« uses an integrated microphone to pick up the sound and transmits the corresponding inductive signals via the integrated loop.

Power can be provided by the power cord included with the system or by the integrated rechargeable battery.

- A 4205 Black
- A 4206 Yellow
- A 4207 Beige



#### technical data

- Dimensions (HxWxD): 185 x 170 x 65mm
- Weight: 420 g
- Microphone sensitivity: bis 60 dB ± 3 dB
- Primary power supply: 100-240 V, 50-60 Hz AC power cord
- Secondary: 15 V DC or using built-in 12 V NiMH battery
- Output power: Max. 7W



### THE COUNTER LOOP amplifier

The Counter Loop is a mains powered loop amplifier that provides a cost effective solution for Counters or small rooms of up to 25m<sup>2</sup>. The unit comes supplied with a microphone and loop. Additionally, the amplifier has two microphone inputs as well as line level input, so it is possible to have two input sources operating at once.

#### technical data

- Dimensions: 185mm x 87mm x 45mm
- Weight: 220 g
- Mounting: 2 x fixing holes to allow for screw mounting
- Audio Inputs: 2 x 3.5mm jack sockets with phantom power for Unbalanced Electret Mics
- Microphone Sensitivity: - 62db + 3db
- Power supply: 15v DC @1 A Maximum.



### LA-215 induction loop amplifier

The LA-215 is able to supply living quarters or small conference rooms up to approx. 50m<sup>2</sup> in size with inductive audio signals via the loop connected. The system includes a 37-m long induction loop wire. In addition to settings for basic volume and tone, the digitally controlled

induction loop amplifier uses Automatic Gain Control to stabilise the volume for fluctuating input levels. The device is able to accommodate the connection of two audio sources. For example, it is possible to add a Microphone to allow for the mixing of background noises as well as audio to be transmitted. The desired source can be selected at the touch of a button.

#### Technical data

- Dimensions: (HxWxD): 42 x 180 x 140 mm
- Weight: 905 g
- Colour: Silver-metallic
- Power supply: 240 V AC 50 Hz 20 VA
- 1 microphone cord (4 m long) and 1 cord for direct connection
- 37-m single-wire loop and loop clips, Scart/Phone Leads



### INDUCTION LOOP PAD pad

Induction loop pad for the Counter Loop/LA-215 (A-4910)

The »pad« contains a small loop. It is connected directly to the LA-215 or Counter Loop induction loop amplifier and placed under the seat cushion or behind the back of a chair to provide a convenient alternative to a 37-m long loop wire when the signal transmission is limited to a very small area.





## induction loop systems

### BA-200 induction loop amplifiers for coaches

The BA-200 induction loop amplifier is designed to provide inductive audio signals in coaches. The amplifier is equipped with settings for basic volume and tone and uses Automatic Gain Control to effectively support volume stabilization for fluctuating input levels.

Digital control makes it possible to select one of the two audio sources connected at the same time, e.g. a microphone and a music system. Microphone, audio connection cable and induction loop wire come included with the system.

#### Technical Data

- Dimensions (HxWxD): 42x180x140 mm
- Weight: 905 g / Colour: Silver-metallic
- Power supply: 12 – 24 V DC / Power cord: 2 m



### MOBILE LOOP induction loop amplifier

The induction loop system kit contains a complete, portable induction loop system designed for rooms up to 140 m<sup>2</sup> in size. The set consists of the PROLOOP C amplifier and two cable reels with 25 metres of loop wire each. The system is easy to use and ready to go *in a flash* – ideal for temporary installations.

#### Technical Data

- Power supply: 220 - 240 V
- Weight: 8.7 kg
- Colour: Silver
- Dimensions (HxWxD): 150 x 450 x 330 mm
- Power cord: 2 m

#### Features

- Three line/microphone input jacks
- Connection option for a wireless microphone (6.3 mm / mono)
- Up to 20 A surge current
- Frequency range 100 - 5300 Hz (-3 dB)



### PROLOOP FSM measuring device

The PROLOOP FSM is a measuring device for the precise measurement of the magnetic field strengths in induction loop systems acc. to IEC 60118-4:2006 and BS 6083, Paragraph 4. The device is designed for professional use and delivers reliable RMS values on the output level, response frequency, AGC function (Automatic Gain Control), distortion and background noise in the induction looped tested. In addition, it enables the user to make an acoustic evaluation of the sound using signal reproduction via earphones.

#### Features

- Compliant with AS 1428.5 for testing equipment used to evaluate induction loop systems.
- True RMS: 125 ms average time
- Crest factor: 3
- A filter weighted
- Measuring range: +6 dB ...-51 dB (0 dB = 400mA/m)
- Power supply: 2 x 1.5V AA batteries, long battery life
- Battery status control via LED
- Headphone jack with volume control



### PROLOOP C induction loop amplifier



#### Features

- Higher output power: 11 A RMS / Short-circuit-proof
- Automatic fuse reset / Two programmable, balanced XLR inputs
- One phono input / Two line outputs
- Extra-sturdy jacks / Dual action AGC for excellent speech recognition
- High availability, operating reliability and quality assurance
- Convenient monitoring of the magnetic field: Can be done using headphones or speakers
- Treble control to compensate for treble losses due to reinforcement

The PROLOOP amplifier family is designed for professional use in medium-sized rooms (up to 170 m<sup>2</sup>) in private buildings and public facilities, in which particularly high dependability and extremely reliable operation are required.

With its 100-percent short-circuit proof amplifier, programmable, balanced XLR input jacks and highly stable output power, the PROLOOP C is able to meet these demands. Automatic Gain Control (AGC) guarantees consistent field strength and reproduces stable sound with a special emphasis on clear speech, even under acoustically demanding conditions. The integrated monitor output and corresponding testing technology can be used to analyse the induction loop audio quality.

#### Technical Data

- Mains connection: 230-240 V AC 50 Hz, 7-200 W, 10 A fuse
- Coverage: 170 m<sup>2</sup> acc. to IEC 60118-4, single-loop, free field

#### Induction loop output

- Max. current: 60 A from peak to peak, 1-5 ms, 1 kHz, 11 A RMS, continuous 1 kHz, short-circuit-proof
- Max. voltage: 31 V from peak to peak
- Output AGC: Sets voltage and power for steady signals like oscillation and sine curves after 0.6-1 seconds to -10 dB. Short pulses and normal program signals are not limited.
- Frequency response: 100 - 5000 Hz (± 3 dB)
- Distortion: < 1%
- Cable connection: Screw connection on rear panel of amp
- Line Outputs 1. LINE OUT: 0 dBm-phono (with AGC function)

#### Line Inputs

- Inputs 1 & 2: 0.5 mV-180 mV / 10 kOhm (mic.) alt. 50 mV - 10 V / 10 kOhm (line) Separate 2-channel AGC, phantom voltage 9-12 V, XLR connections
- Input 3: 50 mV-10 V / 10 kOhm, phono connections

#### AGC

- Dynamics: > 70 dB
- Rise time: 2 - 500 ms
- Fall time: 0.5 - 20 dB/s

#### Controls & Displays

- Treble control: 0 - +9 dB, potentiometer
- Induction loop adjustment: 0 - 170 m<sup>2</sup>, potentiometer
- Displays: One green LED each for mains connection, input level and induction loop current

#### Induction Loop Monitoring

- 6.3 mm jack for speaker and headphone monitoring

#### Enclosure

- Dimensions: 62 x 295 x 188 mm (H x W x D)
- Weight: 2.7 kg
- Colour: Black



## PROLOOP DCC induction loop amplifier



### Features

- Higher output power: 25 A RMS
- Short-circuit-proof
- Automatic fuse reset
- Three programmable, balanced XLR inputs
- Sensitivity, phantom voltage, balanced/ unbalanced and priority can be separated adjusted for each input
- High availability, operating reliability and quality assurance
- Convenient monitoring of the magnetic field: Can be done using headphones or speakers
- Treble control to compensate for treble losses due to reinforcement LED display for mains connection, input level and induction loop current

Designed for rooms up to 800 m<sup>2</sup> in size, the PROLOOP DCC induction loop amplifier is an ideal solution for event venues and larger assembly halls. Short-circuit-proof PLS amplifiers with programmable, balanced XLR inputs and extremely stable as well as large output ratings (up to 25 A RMS) guarantee the high availability of the induction loop system. Automatic Gain Control (AGC) creates consistent field strength to produce stable tone with outstanding speech reproduction – even under difficult acoustic conditions. The integrated monitor output and the corresponding measurement technology make it possible to test the quality of the induction loop system easily and conveniently.

### Technical data

- Mains connection: 230-240 V AC, 50 Hz, 25-700 W, 10 A fuse
- Coverage: 800 m<sup>2</sup> acc. to IEC 60118-4, single-loop

### Induction Loop Output

- IIMax. power: 78 A / 0.06 ohms 25 A RMS, 10-300 ms 1 kHz, short-circuit-proof
- Max. voltage: 47 V from peak to peak, output AGC sets voltage and power for steady signals like oscillation and sine curves, after 0.6 - 1 seconds to -10 dB. Short pulses and normal program signals are not limited.
- Frequency range: 100 - 5000 Hz (±3 dB)
- Distortion: < 1 %
- Cable connection: Screw connection on rear panel of amp

### Outputs

- 1. LINE OUT: 0 dBm-Phono (with AGC function)

### Inputs

- IN 1, 2 and 3: XLR connections, sensitivity, phantom voltage, balanced/ unbalanced and priority can be adjusted separately for each input.

### AGC

- Dynamics: >70 dB
- Rise time: 2 - 500 ms
- Fall time: 0.5 - 20 dB/s

### Controls and displays

- Treble control: 0 - +9 dB (potentiometer)
- Induction loop adjustment: 0 - 800 m<sup>2</sup> (potentiometer)
- Displays: Mains connection: 1 green LED
- Input level: 3 green LEDs
- Induction loop power: 5 red LEDs

### Enclosure

- Dimensions: 88 x 438 x 280 mm (H x W x D)
- Weight: 14 kg
- Colour: Black

## PROLOOP LOS induction Loop amp: low-overspill installations



### Features

- Uniform coverage throughout the room (no dead spots in the middle of the room) / No signal fluctuations when hearing-aid user moves his/her head
- Reduced sensitivity to architecture-related magnetic fields
- High efficiency, low power consumption / 19" design
- Well suited for retrofitted installation in theatres, cinemas, concert halls, schools, conference rooms

The PROLOOP LOS is a compact system designed to operate low overspill systems. It integrates the entire electronic configuration required in a single enclosure to provide a flexibly sized, reliable low-overspill solution for the coverage of adjacent event rooms and assembly halls up to a size of 300 m<sup>2</sup>. The system is equipped with Automatic Gain Control (AGC) to produce stable sound with outstanding speech reproduction, even under difficult acoustic conditions. The values/data required to test the quality of the induction loop system can be conveniently picked up via an integrated monitor output

### Technical Data

- Mains connection: 230 – 240 V AC, 50Hz, 25 – 700 W
- Coverage: 300 m<sup>2</sup> acc. to IEC 60118-4, single-loop

### Induction loop output

- Max. power: 60 A from peak to peak, 1-5ms, 1 kHz, 2 x 13 A RMS, continuous 1 kHz, short-circuit-proof
- Max. voltage: 47 V from peak to peak
- Output AGC: Sets voltage and power for steady signals like oscillation and sine curves after 0.6-1 seconds to -10 dB. Short pulses and normal program signals are not limited.
- Frequency range: 70 – 10000 Hz (±3 dB)
- Distortion: < 1 %
- Cable connection: 2 screws on the rear panel of the amp

### Outputs / Inputs

- Master OUT: 0 dBm, RCA (with AGC function)
- Slave OUT: 0 dBm, RCA (with AGC function)
- IN 1: Combined XLR / 6.35 mm connection plug
- MIC sensitivity 2.5 mV – 10V RMS / 10 kOhms,
- Phantom voltage 9 – 20V or LINE sensitivity 37 mV – 10V RMS/10 kOhm
- IN 2: Dual RCA connections, 45 mV – 10V RMS / 10kOhm
- SCART (IN/OUT): Dual SCART connection plug, 50 mV RMS IN (TV) / OUT (DVD-VCR-SAT)

### AGC

- Dynamics: > 70 dB
- Rise time: 2 – 500 ms
- Fall time: 0.5 – 20 dB/s
- Rise and fall times depend on the currently active channel

### Controls

- Loop setting: 0 – 300m<sup>2</sup> (loop-1 and loop-2 potentiometer; coverage depends on the loop configuration)
- Input level: IN 1 and IN 2 can be adjusted separately

### Displays

- Power supply: LED green, lights up with mains connection
- Correct input signal: LED green, lights up when the AGC input is active
- Induction loop power: LED green

### Enclosure

- Dimensions: 88 x 438 x 280 mm (H x W x D)
- Colour: Black





## other assistive listening options

### HUMANTECHNIK Other Assistive Listening Options

#### Infrared Systems

How does an infrared audio transmission system work?

An IR audio transmission system consists of at least one transmitter and one receiver. The transmitter is connected to an audio source – to a microphone system, for example – and transmits the signals received in the form of infrared light impulses wirelessly to the receiver, which converts the light impulse received into electrical audio signals and feeds them into the reproduction device connected – into headphones, for example, or a teleloop for the inductive direct transmission to hearing aids (see diagram).

#### Areas of application

Apart from the home environment, in which the wireless reception of audio signals via infrared light has long since become a popular alternative to the corresponding radiofrequency transmission systems, this technology proves superior to all other transmission principles for certain large professional applications.

This applies in particular to venues and facilities, in which the confidentiality of the information exchanged there plays a decisive role, for example in courtrooms or conference rooms, and areas, in which several transmission systems are operated parallel to one another in neighbouring rooms, such as in multiplex cinemas or in living quarters in social facilities.

In addition, infrared audio transmission systems have proven valuable in schools and universities, in large auditoriums with partial signal coverage or in city centres, in which there is a very high rate of radio frequency emissions.

#### Advantages of infrared transmission technology

- Infrared light signals cannot pass through walls, which reduces reception to the room in which the transmitter is installed.
- Transmission is reliable and absolutely free of the interference caused by electromagnetic fields or structural elements in the building, such as metal reinforcements. In addition, these systems do not produce any electromagnetic emissions themselves.

#### Coverage

While the range of systems designed for private use is limited to about 10 or 20 metres, high powered infrared transmitters are able to provide coverage for much larger rooms. The transmitters described in this product overview, for example, are able to provide coverage for up to 2600 m<sup>2</sup>.

#### Other characteristics of infrared audio transmission systems:

- Portable/mobile systems are available.
- Multi-channel operation provides for flexible use, making it possible to simultaneously transmit several different languages, for example.

#### Other factors affecting infrared transmission technology:

The transmitter does not focus the emission of the infrared light impulses, i.e. it uses a very large transmission angle.

As a result, there is generally no need for a specific *line of sight* between the transmitter and the receiver. The signals do not only travel directly between the transmitter and the receiver, but are also reflected from the walls, ceilings and floors. Nevertheless, pillars and furniture – depending on their size and position – can interfere with or even block reception under certain conditions.

In any case, a technically correct, precise positioning of the transmitters is required for optimal signal coverage.

- Light-coloured floor, wall and ceiling areas reflect infrared energy more strongly. This can increase the reception range.
- Dark, low-reflection floors, ceilings and walls absorb the energy and can limit reception ranges as a result. The carrier frequencies of 2.3 to 3.8 MHz (basic band) minimize the probability of interference resulting from powerful lighting. However, functional problems due to direct sun light cannot be ruled out altogether.
- In order to provide coverage for areas that exceed the maximum range of the individual transmitters, it is necessary to install several transmitters at different locations and connect them in parallel.

The signals are transmitted to the hearing aid via a special infrared receiver with audio amplification equipped with a teleloop (induction). If the receiver is equipped with an audio output jack, it is also possible to use headphones or earphones. Amplifying infrared audio receivers are available as pocket devices, 'under the chin' receivers, headphones with reception diodes or in the LR version with a teleloop and audio output.

If the reception range is the main criterion for the application in this context, it is advisable to consider the use of a radio-frequency system as an alternative – also taking into consideration the cost factor.





## other assistive listening options

### WIR TX 9 High-powered infrared transmitter (4 Channel)

The TX9 infrared transmitter uses a wide emission angle and a typical roughly circular geometry (see diagram below) to send signals into the room. The operating bandwidth of 2.3 to 3.8 MHz guarantees interference-free operation, unaffected by the extraneous light from other portions of the spectrum.

With a signal coverage of 2600 m<sup>2</sup> in one-channel operation, the TX9 can also be used in large rooms. The connection of additional TX9 transmitters increases or multiplies the reception range.

The system comes with a mounting kit for the wall and ceiling.

The TX9 is not equipped with a modulator function, which means that the separately available MOD 232 modulator is required to connect the system to the audio source and to process the signals.

#### Technical Data:



- Dimensions (H x W x D): 15,9 x 28,6 x 5,4 cm
- Weight: 900 g
- Colour: Black with white text, red acrylic faceplate
- Power supply: 24 VAC, 50 – 60 Hz, 35 VA, 3-pin MOLEX connector (each WIR TX9 requires its own power supply)
- Mains connection: NEC class 2-wire, max. length: 61 m
- Displays: Voltage: green / basic band: red
- Carrier frequency: 50 kHz to 8 MHz
- IR transmitter power: 3.5 W

#### Reception range/coverage areas

- 2600 m<sup>2</sup> in 1-channel mode with RX22-4 or RX12-4 receivers
- 1700 m<sup>2</sup> in 2-channel mode with RX22-4 or RX12-4 receivers
- 325 m<sup>2</sup> in 1-channel mode with the RX14-2 receiver
- 285 m<sup>2</sup> in 1-channel mode with the RX16 receiver
- Basic band input: BNC, 100 mV per carrier, 50 (for the WIR TX9 or MOD 232 only)
- Basic band output: BNC, 50 (for the TX9 only)
- Basic band cable: RG 58 coax, BNC plug, max. length: 300m
- Ambient conditions: 0 – +50 °C ambient temperature (non-condensing, non-corroding environment)
- Installation types: Wall or ceiling mounting: BKT 024 installation kit
- SS-11 or SS-6 microphone stand set
- Guarantee: 5 years for transmitters, 90 days for accessories
- Certifications: CE, FCC, ROHS, WEEE,
- Compatible receivers: WIR RX12-4 four-channel receiver, RX14 stereo receiver, RX16 two-channel receiver

### WIR TX90 two-channel infrared transmitter

The two-channel TX90 infrared transmitter combines the modulator and transmitter as one unit in a single enclosure. This design saves money and does not take up a lot of room during transportation.

The TX90 transmitter uses a wide angle for the efficient emission of the infrared signals into the room to be provided with coverage. With an operating bandwidth of 2.3 to 3.8 MHz, the transmission of the TX90 is reliable and immune to the effects of extraneous light.

In 1-channel mode, the transmitter is able to cover up to 2600 m<sup>2</sup>. With the addition of another TX9 transmitter, it is possible to easily expand the reception range. The system includes an installation kit for wall and ceiling mounting.

Stands for freestanding installation are also available.



#### Technical Data

- Dimensions (H x W x D): 15,9 x 28,6 x 5,4 cm
- Weight: 800 g
- Colour: Black with white text, black acrylic faceplate
- Power supply: 24 VAC, 50 – 60 Hz, 35 VA, 3-pin MOLEX connector
- Mains connection: NEC class, 2-wire, max. length 61 m
- Modulation: FM wideband, + 50kHz
- Carrier frequency: Channel A: 2.3 / 2.8 MHz (selectable)
- Channel B: 3.3 / 3.8 MHz (selectable)
- IR transmission power: 3.5 W

#### Reception range / coverage areas

- 2600 m<sup>2</sup> in 1-channel mode with the RX12-4 receiver
- 1670 m<sup>2</sup> in 4-channel mode with the RX12-4 receiver
- 325 m<sup>2</sup> in 1-channel mode with the RX14-2 receiver
- 285 m<sup>2</sup> in 1-channel mode with the RX16 receiver
- Desired signal /background noise: >75 dB / +3 dB
- Response frequency: 80 to 15000 Hz, electrical
- Compression: Music 1:1
- Speech 1.5:1
- Hearing aid 2:1 (default setting)
- Automatic shutoff: Switches off after 20 signal-free minutes





## other assistive listening options

### MOD 232 modulator A-4092-0

The MOD 232 Modulator is connected to the audio source. It processes these signals and sends them to the transmitter. The transmitter then converts this data into infrared light impulses and sends them out at a wide angle into the room to be provided with coverage.

Conferences are often plagued by limited acoustic quality. That's why the MOD 232's audio-processed signals focus on speech frequencies for well-balanced good reproduction and reduce undesirable background noise. As a result, people can listen to longer lectures and events without tiring.

Like the TX9 transmitter, the MOD 232 modulator also includes an installation kit for wall and ceiling. Rack mounting kits also available.



#### Technical Data

- Dimensions (H x W x D): 4,4 x 21,5 x 20,8 cm
- Weight: 1.500 g
- Colour: Black with white lettering
- Rack assembly: 1/2 rack unit in width, 1 rack unit in height; with RPK 005 (simple) or RPK 006 (double) installation kits either one or two modulators can be installed in one rack.
- Power supply: 24 VAC, 50 – 60 Hz, 15 VA
- Modulation: FM broadband,  $\pm 50$  kHz deviation, 50  $\mu$ S pre-distortion
- Carrier frequency: Channel A: selectable 2.3 / 2.8 / 3.3 / 3.8 MHz. Channel B: selectable 2.3 / 2.8 / 3.3 / 3.8 MHz
- Signal-to-noise ratio: > 60 dB
- Frequency response: 30 to 16000 Hz + 1 dB, -3 dB
- Harmonic distortion: Less than 2 %
- Audio processing: Compression (rising) adjustable from 1:1 to 4:1  
Switchable compression amplification: Moderated 16 dB; max. 33 dB
- Microphone level: Symmetrical, Lo-Z, 100  $\mu$ V min. to 90 mV max., 1 mV nominal, 3 k  $\Omega$  input impedance, delivers switchable neutral current according to DIN 45596 for condenser microphones
- Line level: Symmetrical or asymmetrical, 21 mV min. to 10 V max., 212 mV nominal, 100 k  $\Omega$
- Audio line output: RCA jack, channel A and channel B, 500 mV, asymmetrical, 100  $\Omega$  source impedance (load impedance must be larger than 1 k  $\Omega$ )
- Basic band input: BNC, allows mixing with additional modulator MOD 232 (4- channel mode), 100 mV, 50  $\Omega$  input impedance
- Basic band output: Two BNC jacks lead the basic band signal, 100 mV / channel, 50  $\Omega$  source impedance, to be used exclusively with WIR TX9 or MOD 232
- Automatic shutoff: Switches off after 30 signal-free minutes
- Certifications: CE, FCC Section 15, Industry Canada, AS
- Ambient conditions: 0 – +50 °C ambient temperature (non-condensing, non corroding environment).

### A-4903-0 under-the-chin receiver

Under-the-chin receiver weighing less than 30 g for connection to the RX22-4 receiver.



### A-4904-0 in-ear headset

You receive the signals from the RX-22-4 system very discretely and inconspicuously, such as at public events.

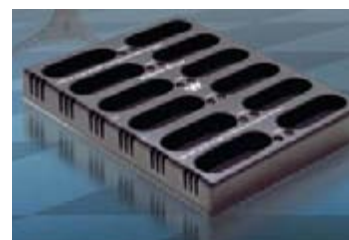
### A-4921-0 teleloop

Teleloop for connection to the RX22-4 receiver Direct inductive audio transmission to hearing aids equipped with a telecoil (switch set to »T« or »MT«)



### A-4978-0 12 receiver charger

12 receiver charger for the RX22-4 infrared receiver.



### A-4979-0 dual-charger

2 receiver charger for the RX22-4 infrared receiver





## other assistive listening options

### RCI 102 two-channel infrared – under-the-chin receiver

The RCI 102 is an ergonomically designed under-the-chin receiver that weighs just 52 grams and is equipped with swivelling earpieces, which means that the earpieces retain their position in the ear even when the user turns his/her head.

The flexible material used to make the ear buds also nestles gently into the auditory canal to effectively subdue any ambient noise.

Stereo or selective mono reception, e.g. for multi-language transmissions. The RCI 102 is equipped with a switch to select the frequency channels. Both channels are constantly active for stereo transmissions. If the event organizer uses both the 2.3 MHz and the 2.8 MHz frequency ranges to transmit in two different languages at the same time, the listener can select the channel in his/her preferred language and receive the information in mono mode.



#### Technical Data

- Weight: 52 g with battery
- Colour and material: ABS plastic, black and red
- Rechargeable battery, battery life: BAT AP97A NIMH battery, approx. 5 h
- Modulation processes: FM, mono or stereo
- Sound freq transmission range: 15 - 20000 Hz
- Operating frequencies: 2.3 MHz and 2.8 MHz
- Possible selections: stereo reception or either frequency for mono reception
- Harmonic distortion: <1%
- Signal-to-noise ratio: Typically 60 dB
- Controls: Knob for volume; Balance can be adjusted with the help of a screwdriver
- Maximum volume: Approx. 120 dB
- Main switch: Integrated in the receiver

### RX22-4 infrared receiver

The RX22-4 is a portable four channel infrared receiver (pocket receiver), which can be worn on a strap around the neck. The receiver is compatible with all transmitters that operate at frequencies from 2.3 to 3.8 MHz.

The receiver is easy and convenient to use. It is limited to just two operating elements: a knob for the combined on/off/volume function and a four-stage switch for channel selection. The selective channel setting allows the listener to select a language, for example, for simultaneously interpreted information.

The RX22-4 is equipped with connection jacks for mono or stereo headphones. In addition, a teleloop for the inductive transmission of sound to hearing aids can also be connected. Dual IR reception diodes guarantee maximum reception sensitivity within the transmission zone.



#### Technical Data

- Type of receiver/design: Pocket receiver with dual reception diode, carrying strap (can be worn around the neck)
- Dimensions (H x W x D): 104.1 x 72.4 x 30.4 mm
- Weight: 127 g, incl. batteries
- Colour: Black
- Carrying strap: 91 cm
- Operating temperature: -10 °C to +50 °C
- Battery type: 2 x AA, Alkali (001) or NiMH (026)
- Battery life: Alkali: 60 h / NiMH: 30 h
- Charging contacts: For the CHG 3512 only
- Carrier frequencies: Channel 1: 2.3 MHz. Channel 2: 2.8 MHz. Channel 3: 3.3 MHz. Channel 4: 3.8 MHz
- Linear pre-distortion: 50 µsec.
- FM deviation: ±50 kHz
- Signal-to-noise ratio: 60 dB min.
- Noise limiter: Receiver cuts off at 40 dB S/N
- Response frequency: 25 Hz to 16 kHz, +1 dB, -3 dB, electrical
- Harmonic distortion: < 1%, electrical
- Operating elements: On/off/volume: combined knob
- Channel selection: four-stage switch
- Operating display: LED constant, flashing indicates low battery
- Audio output: 3.5 mm, stereo (mono or stereo operation)
- Audio output power: Max. 15 mW at 32
- Acoustic output: 125 dB SSPL90 with HED 021; 110 dB SSPL90 w / EAR 013
- Sensitivity: Better than 1 nW/cm<sup>2</sup> for 40 dB signal-to-noise ratio
- Certifications: CE, FCC, ROHS, WEEE

