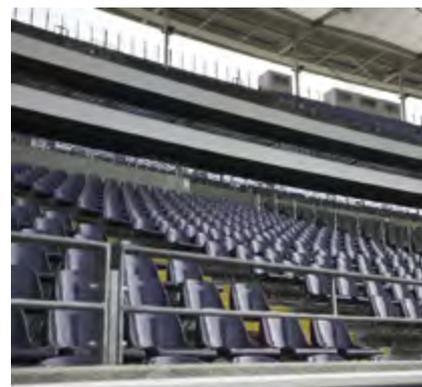


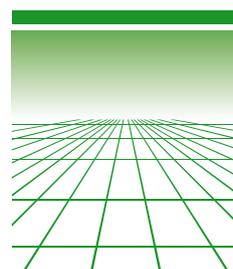
# Accessible Audio transmission systems



**Induction loop systems,  
radio-frequency and  
infrared transmission  
systems:**

The technology, consulting  
and services package for the  
professional use of audio  
transmission systems in private  
and public environments

HUMANTECHNIK – Your partner  
for audiological products





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**Accessible Audio  
transmission systems**

*This information brochure shows the structure and scope of the HUMANTECHNIK programme »Accessible Audio transmission systems« at the time of its publication, 10/2009. HUMANTECHNIK GmbH reserves the right to make technical developments and changes to the structure and scope of its delivery programme in respect of the components described here. This brochure is therefore exclusively for information about available systems, their accessories and application - but is not binding as far as orders are concerned. We will be pleased to advise you on the basis of the current programme status before you place your order.*



## Accessible sound: Greater independence in public life for people with hearing disabilities.

### **The percentage of people with impaired hearing is on the increase.**

The demographic shift in age has had a decided impact on this development. Hearing loss – even if only slight – can now be detected in every fourth 50- to 59-year-old. Among people over 70, the number who are hard of hearing is already considerably higher at more than fifty percent – with significantly greater hearing loss. The percentage of people in these age groups is also expected to increase in the future.

### **Right to participation in cultural life**

This so-called »50plus Generation« is very active in shaping public life. They represent a group with considerable purchasing power, take advantage of a comprehensive range of cultural offers and use all contemporary media. And they also demand – quite justifiably – unlimited access to information and communication – which constitutes acoustically accessible infrastructures in the broadest sense.

### **The accessible design of public and private infrastructures**

The German law for the equality of disabled persons (BGG) defines accessibility as follows: »Buildings and other facilities, means of transport, technical apparatus, systems for information processing, acoustic and visual sources of information and communication facilities as well as all other areas of life are accessible when they are useable by

handicapped people in a general way, without any particular difficulty and without necessitating the help of third parties.«

Needless to say, the term accessibility also includes the access of the hearing impaired to acoustic information – starting with such elementary sounds as alarms and emergency signals to educational information and communications and right on up to acoustic participation in cultural and sporting events.

Even contemporary hearing aids are not able to guarantee good hearing and clear understanding in every situation. In noisy environments or in rooms with extreme resonance or echoes, for example, these systems often quickly reach their limits. That's why audio transmission systems that effectively include or supplement hearing aids are now often used, particularly in places where interruption-free communication is important.

These systems feed the sound either directly into a hearing aid or a CI system or make it available to the user via special receivers.

### **National laws on equality and their implementation**

The application of equality guidelines (anti-discrimination laws) is as diverse as the cultural attributes of the individual European states. While far-reaching measures enabling equal treatment are already common in France, the Netherlands, Great Britain and Scandinavian countries, for example, the provision of accessible infrastructures is lagging behind in other countries – as in Germany.

The equal treatment of the disadvantaged and minorities has, however, now become a central concern of the European Union (EU Basic Treaty). In this respect, the consistent implementation of accessible infrastructures – particularly in government offices, but also in restaurants, at event venues and in public transportation systems – will only be a question of time for all EU nations.

### **Europe's self-image**

The EU appeals to all its member states to not discriminate against anyone because of his/her personal situation. Article 26 of the Charter of Fundamental Rights of the European Union, for example, reads: »The Union recognises and respects the right of persons with disabilities to benefit from measures designed to ensure their independence, social and occupational integration and participation in the life of the community.«

**Technical solutions for accessible sound**

In addition to building acoustics and electro-acoustic public address systems (DIN 18041), the following systems can be used for a significantly higher proportion of direct sound:

- Induction loop systems
- Infrared transmission systems
- Radio-frequency transmission systems

In order to ensure that the listening systems provided are effective, it is important to compare the requirements of the venue and its architectural features with the properties of the transmission systems early in the decision-making process.

**The table (below) provides a brief overview of the main selection criteria.**

The main advantage of all these systems is that the sound is delivered to the listeners in a pure, undistorted form that is not influenced by the distance of the listeners to the sound source or by any annoying background noise in the room.

**HUMANTECHNIK provides a comprehensive range of assistive listening services.**

The HUMANTECHNIK program is structured in a cross-system manner and includes components and the complete range of accessories for transmission systems using all three of the physical principles mentioned here. The following pages will present the technical

components, list their main technical data and provide you with assistance in making your purchasing decision.

Special skills or knowledge are often required in the planning, project development and installation of sound transmission systems. That's why we offer system operators and architects a comprehensive consulting and services package in this field. From qualified information to competent support in the planning process and right on up to the installation and first-time operation of the system, we will accompany you every step of the way with our consulting services to ensure the effective implementation of your professional audio transmission system.



**HUMANTECHNIK offers a comprehensive package of technology, consulting and services for the professional use of audio transmission systems.**

<b>A comparison of systems using different physical transmission principles</b>	Induction loop systems	Infrared transmission systems	Radio-frequency transmission systems
Small to medium-sized conference rooms	●	●	○
Partial provision, e.g. information counters, reception areas, living areas	●	●	●
Cinemas (particularly multiplex cinemas)	●*	●	○
Courtrooms (data confidentiality), conference rooms	○	●	○
City centres (high radio-frequency emissions)	○	●	○
Auditoriums, theatres	●	●	●
Schools and universities	●*	●	●
Stadiums, sport arenas	●**	○	●
Churches	●	●	●
Open-air applications	○**	○	●
Direct reception in the hearing aid (without a special receiver)	●	○	○
Tour-guide systems available	○	○	●
Locally limited reception range	●*	●	○
Not susceptible to electromagnetic interference	○	●	○
Interference-free parallel operation in neighbouring rooms	●*	●	○
Portable systems available	●	●	●
Excellent sound quality	●	●	●
Several channels available	○	●	●
Service provided for very large areas/large range	○	○	●
Easy installation	○	○	●
Inexpensive components and installation	●	○	●
Inconspicuous transmitter positioning (aesthetics)	●	○	●
Transmitter and receiver do not require direct line of sight	●	○	●

- Optimally suited or applicable
- Limited suitability (depending on details of set-up) or limited applicability
- Suitable in exceptions or hardly applicable

\* For use of low-overspill systems (LOS) – \*\* Service provision in partial areas (selected seat rows/blocks)



## Function and use of induction loop systems

### What is an induction loop system?

Using an inductive loop system, hearing-aid wearers can pick up the signals emitted by electric/electronic audio sources (microphone or hi-fi systems) directly in their hearing aids or CI systems. As a result, they hear the sound without any annoying background noise, echo or reverberation. An outstanding advantage of using induction loop systems: no special receivers are required. All that's needed is the hearing aid.

Most modern hearing aids are now equipped with adjustable »M« and »T« functions. »M« stands for microphone, i.e. hearing the sound in the room via the integrated microphone, and »T« (telecoil) means that the audio signals are transmitted inductively and directly via a telecoil integrated in the hearing aid. Some hearing aids are also equipped with an »MT« function, which combines both types of reception, microphone and telecoil so that the listeners are able to hear the sound in the room as well as the inductively transmitted signals.

### How does an induction loop system work?

Alternating current creates a magnetic field in a wire/a loop. If a second wire is introduced into this magnetic field (here: the telecoil in a hearing aid), a correspondingly alternating current will also be created in it: the electrical impulses are »induced« into the second wire without any actual electrical connection.

An induction loop system consists of a loop and an amplifier. The loop, an insulated wire, runs around the outside of the listening area. The

amplifier, connected with an audio source (hi-fi system, speaker's microphone, etc.), transmits the acoustic signals converted into alternating current to the loop.

The magnetic field inside the loop allows the listeners to move freely in the room and pick up the audio signals fed directly into their hearing aids.

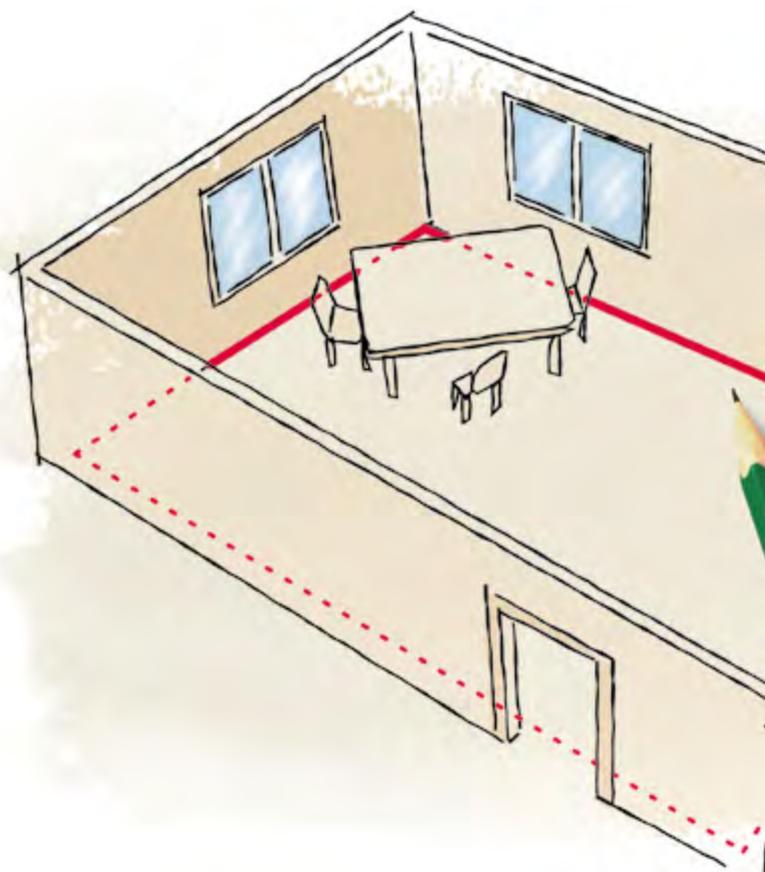
### European standards and legislation

The technical requirements for induction loop systems are defined in the European Standard EN 60118-4 (also known as IEC 118-4). This standard, which HUMANTECHNIK induction loop components meet when installed correctly, regulates the magnetic field strength and the frequency range of the systems. All induction loop systems also comply with the CE standards, which demand the strict control of the equipment with respect to interference, spurious emissions and electrical safety.

### Planning induction loop systems

In order to install induction loop systems correctly, it is necessary to take into account many different factors – with respect to the architecture as well as the area in which they are used. Some areas of use with special requirements include:

- Rooms without equally rectangular or square floor plans
- Strong steel reinforcement or electromagnetic fields from other sources
- Theatres / cinemas / lecture halls
- Rooms in which the loop is positioned far away from the listening level
- Buildings in which several independent loops have to be installed close to one another without interfering with one another.



## Installation tips

**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.

## Selection of the amplifier:

Area used	Amplifier	Page/s
Reception, counter:	soundshuttle / LA-215 / LA-60	8 / 9
TV rooms, nursing homes, living rooms:	LA-215 / PROLOOP C	9 / 10
Conference rooms, theatres:	PROLOOP C	10
	PROLOOP DCC	11
Very large induction loop systems:	PROLOOP DCC	11
	LOS systems	12
Systems with little overspill:	LOS systems	12
Portable induction loop system:	soundshuttle	
	loop system kit	8

*This table serves only as general orientation for selecting the amplifier. Please take advantage of our consulting services before you make your purchase.*

## 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 values indicated can be used for most induction loop systems. For special solutions, please contact HUMANTECHNIK. H07V-K, for example, is recommended as the induction loop wire to use.*

**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.

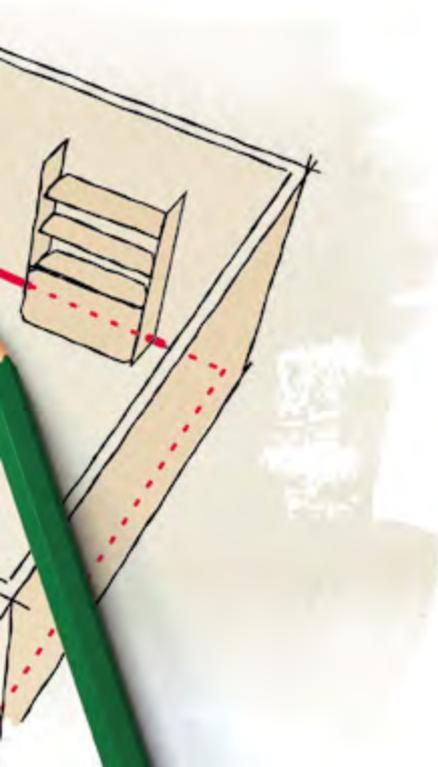
*Loops are generally laid around the outside perimeter of the room. The audio signals are then inductively transmitted to all the »coils« inside the loop.*

**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 to similar objects.



## Notes on the installation of induction loop systems





**soundshuttle**  
**Induction loop kit**  
**BA-200**  
**Portable induction loop systems**

**1 soundshuttle**

- Order No.: A-4205-0 (black)
- Order No.: A-4206-0 (yellow)
- Order No.: A-4207-0 (beige)

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.

An optionally available microphone can be connected via the additional microphone jack ([see table microphone on page 15](#))

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

Technical data
Dimensions (HxWxD): 185 x 170 x 65 mm
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. 7 W

**2 Induction loop system kit**

- Order No.: A-4271-0

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 includes the PROLOOP C induction loop amplifier ([see p. 10](#)) as well as two cable reels with 25 metres of loop wire each and the PROLOOP FSM measuring instrument (incl. DIR under-the-chin receiver, [see p. 15](#)). 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: 11 kg
Colour: Silver
Dimensions (HxWxD): 210 x 610 x 360 mm
Power cord: 2 m
Features
Max. power: 60 A
Max. voltage: 31 V
Frequency range: 100 - 5000 Hz ( ± 3 dB)
Distortion: < 1%

**3 BA-200: Induction loop amplifier for coaches**

- Order No.: A-4225-0

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 stabilisation 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. Two mounting brackets come included with the system.

Technical data
Dimensions (HxWxD): 42 x 180 x 140 mm
Weight: 905 g
Colour: Silver-metallic
Power supply: 12 – 24 V DC
Power cord: 2 m



**4 LA-60**

**Order No.: A-4213-0**

The LA-60 induction loop amplifier is designed for use in small rooms up to 16 m<sup>2</sup> or for partial signal coverage, at information counters, for example. It is equipped with two line/mic input jacks, which can be selected and activated by flipping a switch. The control switch is used to individually adjust the volume. Control lamps help in the operation of the system by indicating the corresponding status signals.

Technical data	
Power supply:	180 – 265 V AC 50/60 Hz 10 VA
Dimensions (HxWxD):	65 x 121 x 35 mm
Weight:	146 g
Output power of the induction loop system	
1.3 A RMS, 1.82 A surge output current	
100 - 5 kHz – compliant with the BS6083 pt4 (IECI 18-4) standard for a loop, with 24 / 0.2 cable (0.75 mm <sup>2</sup> ) at 0.03 ohms/m	



**Induction loop pad for the LA-60 or the LA-215**

**Order No.: A-4910-0**

The »pad« contains a small loop. It is connected directly to the LA-215 or LA-60 induction loop amplifier and placed under the seat cushion or behind the back of a chair. The connection cord for the pad is 4.50 m long. As a result, the signal coverage can be restricted to a very small area.

**5 LA-215**

**Order No.: A-4223-0**

The LA-215 is able to supply living quarters or small conference rooms up to approx. 50 m<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. The desired source can be selected at the touch of a button.

Technical data	
2x mic jacks	
2x line in jacks	
2.85A RMS, 4A max. output power	
Dimensions (HxWxD): 42 x 180 x 140 mm	
Weight: 905 g	
Colour: Silver-metallic	
Power supply: 230 V AC 50 Hz 20 VA	
Power cord: 2 m	
What's included	
LA-215 with power cord	
1x mic with 4 m of cable	
37 m of single-wire strand 0.75 mm <sup>2</sup> and Cable clips	
Scart- / Cinch-cable	

**LA-60  
LA-215  
Induction loop pads**

**Induction loop amplifiers and components for small to medium-sized rooms**

**LA-220  
Order No.: A-4226-0**

Use and equipment delivered is identical to the LA-215, except it also includes an external power supply



## PROLOOP C

### Induction loop amplifier

- High output current: 11 A RMS
- Short-circuit-proof
- Automatic fuse reset
  - Two symmetrical XLR input jacks
  - One RCA input jack
  - One line output jack
  - 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



#### PROLOOP C

Order No.: A-4246-0

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.

Thanks to a 100-percent short-circuit-proof amplifier, switchable, symmetrical XLR input jacks and extremely stable output performance, 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.

Corresponding test equipment can be used to evaluate the sound quality via the integrated monitor out jack.

#### Technical data for the PROLOOP C

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
<b>Induction loop output</b>	
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 the amplifier
<b>Outputs</b>	
1. LINE OUT:	0 dBm-RCA out (with AGC function)
<b>Inputs</b>	
IN 1 und 2:	0.5 mV-100 mV / 10 kOhm (mic.) alt. 25 mV - 4 V / 10 kOhm (line) AGC, switchable phantom voltage, XLR connections
IN 3:	50 mV-10 V / 10 kOhm, RCA connection
<b>AGC</b>	
Dynamics:	> 70 dB
Rise time:	2 - 500 ms
Fall time:	0.5 - 20 dB/s
<b>Controls and displays</b>	
Treble control:	0 - +9 dB, potentiometer
Induction loop adjustment:	0 - 170 m <sup>2</sup> , potentiometer
Displays:	Mains connection: 1 green LED Input level: 1 green LED Induction loop power: 1 green LED
<b>Induction loop monitoring</b>	
6.3 mm jack for headphone connection	
<b>Enclosure</b>	
Dimensions:	64 x 295 x 205 mm (H x W x D)
Weight:	3.6 kg
Colour:	black



## PROLOOP DCC

### Induction loop amplifier

#### Technical data for the PROLOOP DCC

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

Max. 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 ( $\pm 3$ dB)
Distortion:	< 1 %
Cable connection:	Screw connection on rear panel of the amplifier

#### Outputs

1. LINE OUT:	0 dBm-RCA (with AGC function)
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#### Inputs

IN 1, 2 und 3:	XLR connections (0,5 - 100 mV) microphone / (25 mV - 4 V) Line, sensitivity, phantom voltage, balanced/unbalanced and priority can be adjusted separately for each input.
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#### 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

#### Induction loop monitoring

6.3 mm jack for headphone connection
--------------------------------------

#### Enclosure

Dimensions:	90 x 439 x 295 mm (H x W x D)
Weight:	9.5 kg
Colour:	black

#### PROLOOP DCC

Order No.: A-4263-0

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 amplifiers with switchable, symmetrical XLR inputs and strong output performance (up to 25 A RMS) guarantee that the induction loop system remains highly available.

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.

- High output current: 25 A RMS
- Short-circuit-proof
- Automatic fuse reset
- Three symmetrical 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
- 19" rack design



## Low-overspill systems (LOS): Induction loop systems with low overspill

Standard induction loop systems produce a magnetic field that usually exceeds the »core service area«. This »overspill«, which travels horizontally and vertically, might still be audible three to four loop widths away. This limits the use of this technology.

### Low-overspill systems expand the application options of induction loop systems.

Low-overspill systems (LOS) considerably reduce »overspill«. They use special loop patterns to reduce the signal strength outside the loop. For these patterns, two loops have to be operated out of phase with each other to achieve an equal distribution of the desired signal without creating any undesirable signal-free areas.

An LOS system consists of **two** induction loop amplifiers that are operated out of phase. This configuration prevents overspill and makes it possible to operate several induction loop systems in adjacent rooms without having their signals interfere with each other:

- No field strength reduction in the centre of the loop due to reinforced concrete,
- Greater reproducibility of the results,
- Reduced danger of feedback due to lower power consumption,
- Extremely low overspill at reduced directional sensitivity.

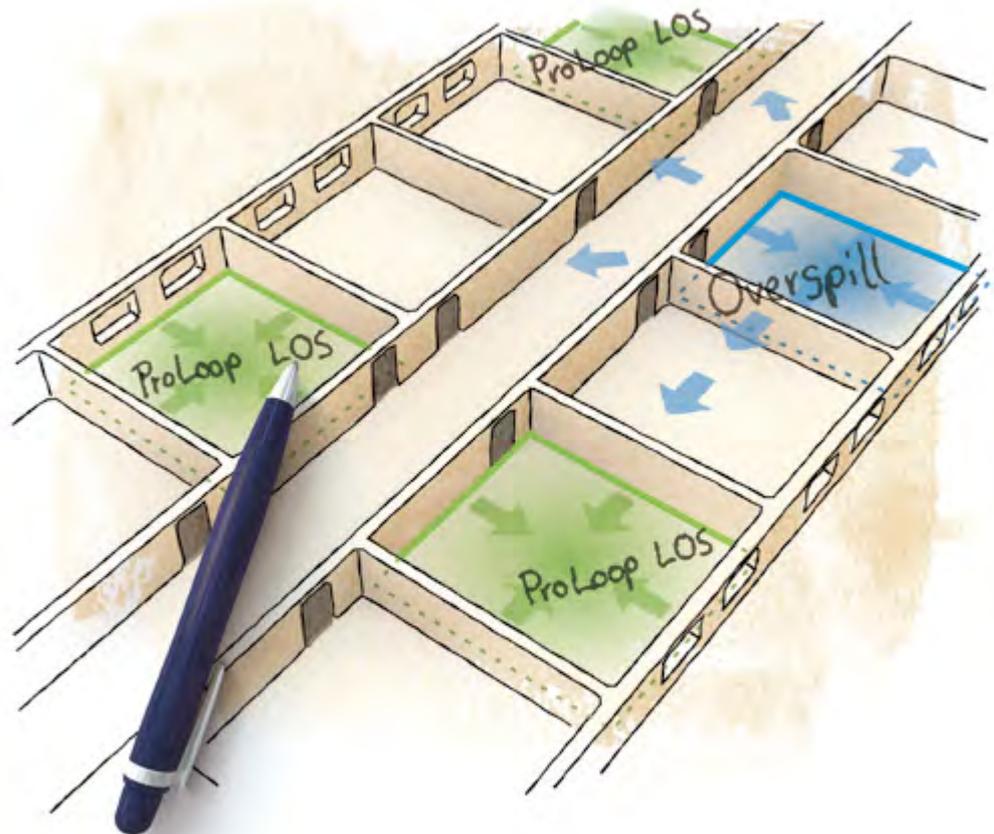
### HUMANTECHNIK service for planning low-overspill systems

Each individually optimal customisation and configuration depends on the conditions prevailing in the area of application, in other words, on the room floor plans and the sizes of the coverage areas, the number of internal loops and the demands made on low overspill.

Determining the corresponding values for the »customised« low-overspill layout and the optimal level adjustments in each case is based on a complex method of calculation and installation. **That's why we strongly recommend that you take advantage of the services offered by HUMAN-TECHNIK.** We provide competent support to architects, technicians and installers in planning LOS installations.

The overspill ■ of standard induction loop systems works in a horizontal and vertical direction. The resulting »eaves-dropping effect« is often still measurable over distances of up to three induction loop widths.

- Low-overspill systems (LOS) that are competently customized and configured reduce overspill considerably to allow the operation of induction loop systems in directly adjacent rooms.





## PROLOOP LOS

### Induction loop amplifier system for low-overspill installations

- *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, housing, etc. (Possible for floor reconstructions only)*

Technical data	
Mains connection:	230 – 240 V AC, 50Hz, 25 – 700 W
Coverage:	300 m <sup>2</sup> acc. to IEC 60118-4
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:	100 – 5000 Hz (±3 dB)
Distortion:	< 1 %
Cable connection:	2 screw connections on rear panel of the amplifier
Outputs	
Master OUT:	0 dBm, RCA (with AGC function)
Slave OUT:	0 dBm, RCA (with AGC function)
Inputs	
IN 1:	Combined XLR / 6.35 mm connector MIC sensitivity 2.5 mV – 10V RMS / 10 kOhm, LINE sensitivity 37 mV – 10V RMS / 10 kOhm or phantom voltage 9 – 20 V
IN 2:	Dual RCA connections, 45 mV – 10V RMS / 10kOhm
IN 3:	Dual RCA connections, 45 mV – 10V RMS / 10kOhm
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 and displays	
Loop setting:	0 – 300m <sup>2</sup> (with one potentiometer each for master and slave outputs)
Input level:	IN 1 and IN 2 can be adjusted separately
Displays:	Mains connection: 1 green LED Input level: 1 green LED Induction loop power: 2 green LED
Induction loop monitoring	
Two 6.3 mm jacks for headphone connection	
Enclosure	
Dimensions:	88 x 438 x 280 mm (H x W x D)
Colour:	Black
Weight:	9.3 kg

### PROLOOP LOS

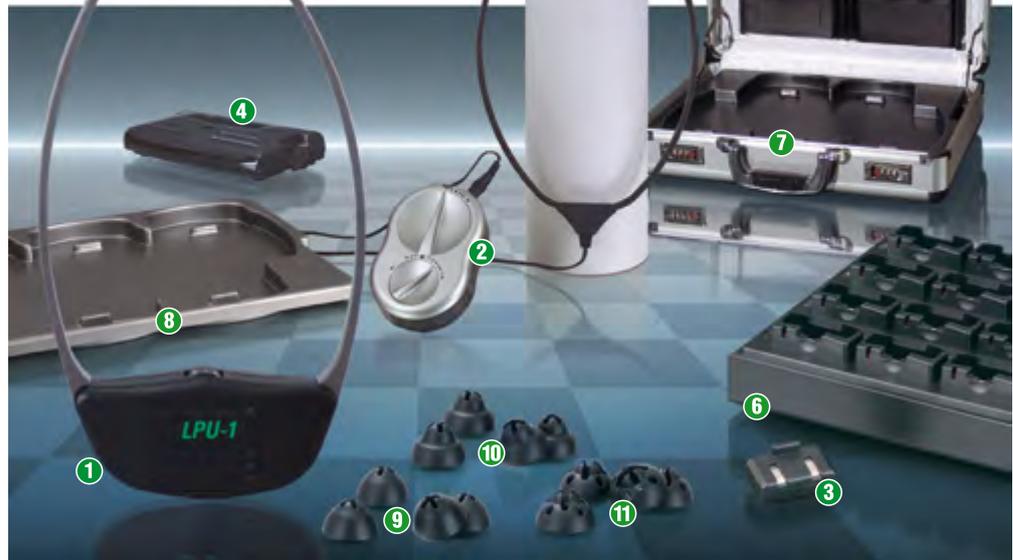
Order No.: A-4252-0

The PROLOOP LOS is a complete system for the operation of low-overspill systems. It includes the complete range of electronics required in a single enclosure. Thus, there is a flexibly sized, reliable low-overspill solution available to serve neighbouring event rooms and assembly halls up to 300 square metres in size.

The system is equipped with Automatic Gain Control (AGC) to produce stable sound with outstanding speech reproduction, even under difficult acoustic conditions. The integrated monitor output for the corresponding measurement technology makes it possible to easily and conveniently test the sound quality of the induction loop system.



## »Induction loop receiver« and accessories



### 1 LPU-1: Induction loop receiver / Under-the-chin receiver

Order No.: A-4276-0

The LPU-1 takes the signals transmitted by the induction loop system directly to the ears of people who do not wear hearing aids. The ear buds of the featherweight, ergonomically designed under-the-chin receiver can swivel to stay firmly fixed in the user's ears even when he/she moves his or her head. The flexible material used to make the ear buds also nestles gently into the auditory canal to effectively subdue any ambient noise.

#### LPU-1: Technical data

Sound frequency transmission range:	70 - 5400 Hz
Distortion factor:	< 1 %
Signal-to-noise ratio:	Typ. 60 dB
Battery charging time:	Approx. 6 h
Operating time:	Approx. 6 h
Maximum volume:	Approx. 120 dBA
Weight:	47 g

### 2 CRESCENDO 50

Order No.: A-4202-0

The universal CRESCENDO 50 audio amplifier, which was specially designed for dialogue situations, can also be used as a pocket receiver for induction loop systems. An under-the-chin receiver serves as the listening device.

### 3 A100: Additional battery for the LPU-1

Order No.: A-4970-0

### 4 Single-bay recharger for the LPU-1

Order No.: A-4977-0

When the LPU-1 is not in use, it can be placed into the recharger to recharge.

### 5 5-bay recharger for the LPU-1 under-the-chin receiver

Order No.: A-4976-0

### 6 12-battery recharger for the A100 battery

Order No.: A-4974-0

### 7 Aluminium case designed to accommodate up to 15 receivers

Order No.: A-4072-0

The tray in the case provides for the safe and reliable storage and transport of up to 15 LPU-1, RCI-102, *InfraLight* or *RadioLight* receivers. In addition, the induction loop receivers can also be conveniently distributed »straight from the case«.

### 8 Plastic tray for 5 under-the-chin receivers

Order No.: A-4955-0

Safe-transport storage system – which can be used in the A-4072-0 case, for example – for receivers from the *InfraLight*, *RadioLight* and LPU-1 series.

### Silicone eartips for LPU-1 under-the-chin receivers (also for RCI-102, *InfraLight* and *RadioLight*)

#### 9 Standard

Order No.: A-4985-0 (2 Paar)

Order No.: A-4987-0 (24 Paar)

#### 10 Tapered shape

Order No.: A-4988-0 (2 Paar)

Order No.: A-4989-0 (24 Paar)

#### 11 Perforated

Order No.: A-4993-0 (2 Paar)

Order No.: A-4992-0 (24 Paar)



**12 XLR(M) adapter cord -->**  
3.5 mm cinch

Order No.: A-4933-0

e.g. to connect to CD players or stereo systems

**13 Induction loop pad**  
([description, see p. 9](#))

Order No.: A-4910-0

**14 Table microphone with**  
XLR plug connection

Order No.: A-4495-0

needs 2 AA batteries

**15 Cinch connection cord**

Order No.: A-4906-0 (length: 3 m)

Order No.: A-4907-0 (length: 6 m)



**16 XLR(M) --> 6.3 mm plug**

Order No.: A-4939-0

Connection of 1- (UHF101) or 4-channel (UHF401) microphone systems.

**17 XLR(F) --> 3.5 mm plug**

Order No.: A-4934-0

For the connection of the table microphone to the soundshuttle or LA-215.

**18 XLR connection cord**

Order No.: A-4935-0 (length: 2 m)

Order No.: A-4936-0 (length: 6 m)

**19 Copper ribbon cable,**  
50-metre roll

Order No.: A-4937-0

21x0,4 mm – insulated



**PROLOOP FSM: Measuring device**  
for induction loop systems

Order No.: A-4291-0

The PROLOOP FSM is a measuring device that measures the magnetic field strength of induction loop systems according to IEC 60118-4:2006 and BS 6083, Para. 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 IEC 60118-4:006 and BS for testing equipment used to evaluate induction loop systems.

True RMS: 125 ms average time

Crest factor: 3

A filter

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



»General accessories  
for induction loop  
systems«



**Wireless PLL microphones,**  
1- or 4-microphone systems –  
also recommended as an audio  
source for infrared transmission  
systems ([see p. 18 ff](#)).  
([Description, p. 25](#))



## »Function and use of infrared transmission 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.

### 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 radio-frequency 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.
- Infrared transmission systems can be used easily in many different countries; an »obligation to register« them, similar to the allocation of radio licenses, is not required.

*The transmitter sets up an »infrared signal route« to the receivers of the transmission system. The transmitter's large signal emission angle or the wide signal dispersion and the reflection from walls, ceilings and floors guarantee reliable reception – for the most part, even when smaller obstacles (furniture or pillars) block the direct »line of sight« between the transmitter and the receiver.*



## 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.
- Receivers are compatible with TV listening system for at-home use.

## 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 sunlight 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.\*



## Reliable, inconspicuous audio transmission for rooms up to 2600 m<sup>2</sup> in size

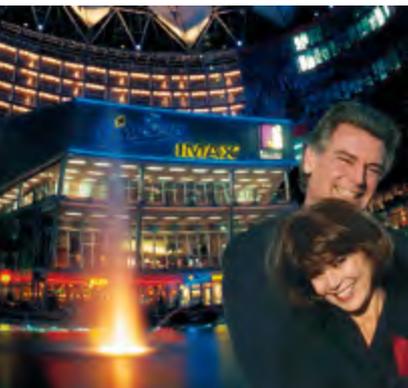


The signals are transmitted to the hearing aid via a special infrared receiver with audio amplification equipped with a teleloop (induction).

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 (p. 22 ff.).



## WIR TX9 High-powered infrared transmitter



### WIR TX9 transmitter

Order No.: A-4030-0

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.

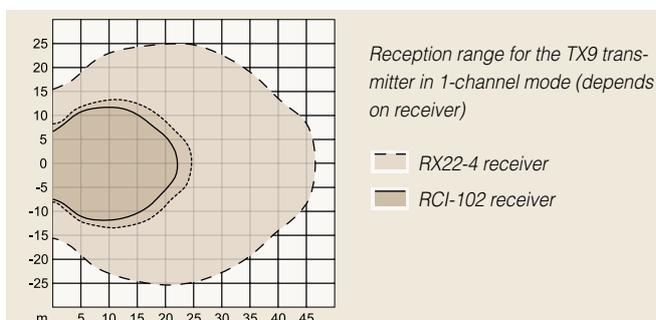
The system comes with a mounting kit for the wall and ceiling.

Stands are also available for free-standing installation.

**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, black 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
Europe:	TFP 027-01, safety plug, 2-pin, CE
Great Britain:	TFP 027-02, 3-pin-UK plug, CE
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 receiver 1700 m <sup>2</sup> in 2-channel mode with RX22-4 receiver 325 m <sup>2</sup> in 1-channel mode with the RCI-102 receiver
Basic band input:	BNC, 100 mV per carrier, 50 Ω (for the WIR TX9 or MOD 232 only)
Basic band output:	BNC, 50 Ω (for the TX9 only)
Basic band cable:	RG 58 coax, BNC plug, max. length: 300 m
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
Certifications:	CE, FCC, ROHS, WEEE,



The transmission energy of infrared transmission systems spreads out in a roughly circular shape with a wide emission angle.



## MOD 232

### Modulator for the operation of the WIR TX9 transmitter

#### Technical data

Dimensions (H x W x D):	4.4 x 21.5 x 20.8 cm
Weight:	1500 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 IEC rack.
Power supply:	24 VAC, 50 – 60 Hz, 15 VA Europe: TFP 027-01, safety plug, 2-pin, CE Great Britain: TFP 027-02, UK plug, 3-pin CE
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
Audio input:	2xCombo XLR or 6.3 mm cinch plug
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)

#### »MOD 232« modulator

Order No.: A-4029-0

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 mounting.



## Configuration examples for audio using infrared transmission systems

### Typical applications:

- Simultaneous transmission in different languages
- Media rooms
- Courtrooms
- Theatres
- Churches
- Educational facilities

If we consider the TX9 transmitter and the MOD 232 modulator (description: pages 18 and 19) as a modular system, it offers not only easy expansion with respect to the audio coverage (also see diagram, p. 21). It also presents new prospects for greater application flexibility.

### TX9 transmitter and MOD 232 modulator: the standard configuration

The MOD 232 modulator serves as the »interface« between the audio source and the infrared transmitter. The standard configuration allows one as well as two-channel operation.

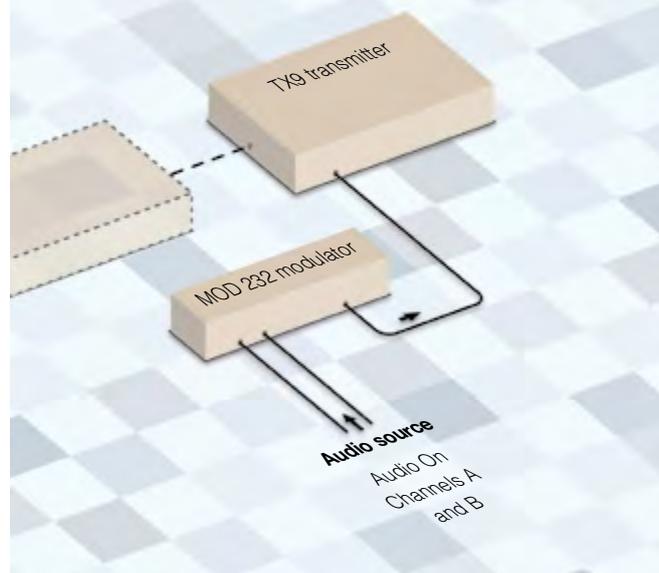
### TX9 transmitter and MOD 232 modulator as a 4-channel system

Using the components as a 4-channel transmission system requires two MOD 232 modulators and two WIR TX9 infrared transmitters. This combination presents high flexibility for a wide range of applications at an attractive price – particularly in areas that require the simultaneous provision of information in several different languages.

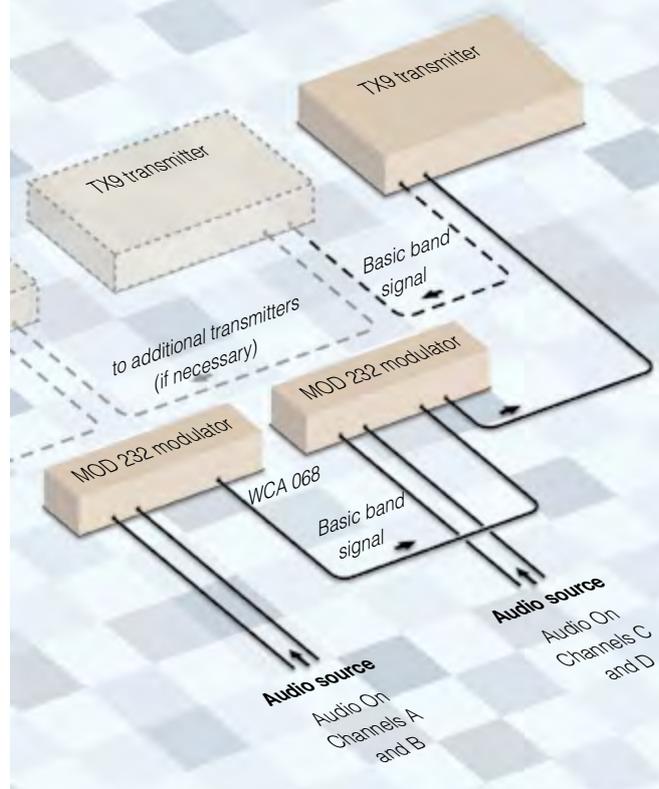
In four-channel mode and using the four-channel RX22-4 receivers (see p. 22), the transmission system is able to provide coverage for approx. 1000 m<sup>2</sup> in its standard configuration.

The components can be used as a stationary installation (e.g. 19" IEC rack mounting for the modulator) or as a portable system with easy set-up and convenient operation.

TX9 and MOD 232: 2-channel configuration

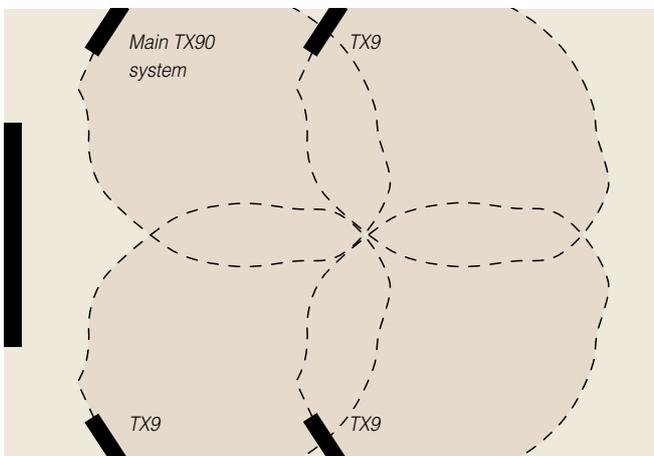


TX9 and MOD 232 in 4-channel operation





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
Europe:	TFP 027-01, safety plug, 2-pin, CE
UK:	TFP 027-02, 3-pin UK plug, CE
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
Audio input:	Symmetrical or asymmetrical line level only, 316 mV RMS 5.7 kΩ input impedance
Reception range / coverage areas:	2600 m <sup>2</sup> in 1-channel mode with the RX22-4 receiver 1670 m <sup>2</sup> in 4-channel mode with the RX22-4 receiver 325 m <sup>2</sup> in 1-channel mode with the RCI-102 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



The reception area can be multiplied by connecting several transmitters – here a TX90 with three TX9.

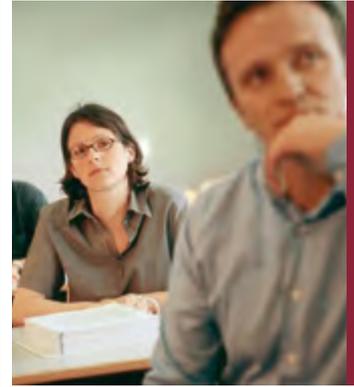
### WIR TX90 transmitter

Order No.: A-4028-0

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.



## WIR TX90

### Two-channel high-powered infrared transmitter with an integrated modulator

#### Possible areas of application:

- Cinemas
- Parallel transmission of different languages (channel selection)
- Conference and meeting rooms as well as multimedia rooms
- Courtrooms and lecture halls
- Schools, universities
- Churches



## RX22-4

### Four-channel infrared receiver

#### Possible areas of application:

- Selective reception of simultaneously transmitted information, e.g. in different languages
- Conference and meeting rooms as well as courtrooms
- Multimedia rooms
- Educational facilities, e.g. schools, universities
- Cinemas, theatres
- Churches, assembly rooms



#### RX22-4 infrared receiver

Order No.: A-4032-0

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 a connection jack that can be used to connect either headphones or a teleloop. 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 or NiMH
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 (mono)
Audio output power:	Max. 15 mW at 32 Ω
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

#### 5 Teleloop

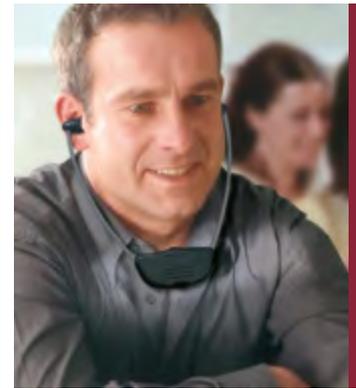
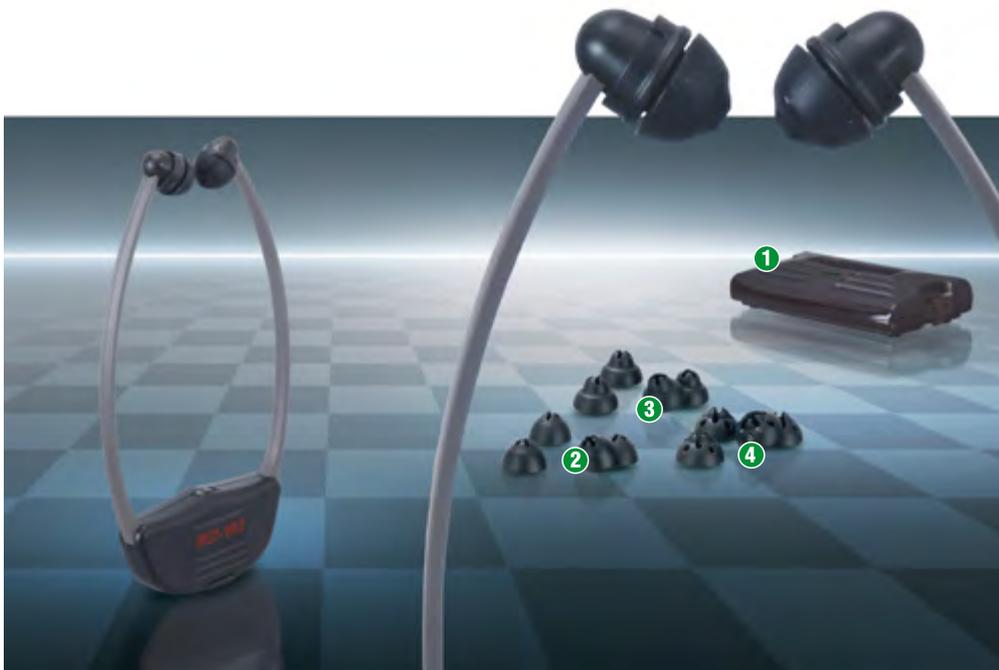
Order No.: A-4922-0

- Teleloop for the connection of the RX22-4 receiver
- Inductive audio transmission to hearing aids or CI systems with a telecoil (switch set to »T« or »MT«)

#### 6 HED 021 headphones

Order No.: A-4913-0

»Deluxe« headphones for adults: 3.5 mm plug to connect to the RX22-4 infrared receiver, 1 m cable



## RCI-102 Two-channel infrared under-the-chin receiver

*compatible with all  
infrared transmitters with  
the operating frequencies  
of 2.3 MHz and 2.8 MHz*

Technical data	
Weight:	52 g with battery
Colour and material:	ABS plastic, black and red
Rechargeable battery, battery life:	A100 NiMH battery, approx. 5 h
Modulation processes:	FM, mono or stereo
Sound frequency 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:	Typ. 60 dB
Controls:	Knob to adjust the volume; Balance can be adjusted with the help of a screwdriver
Maximum volume:	Approx. 120 dB
Main switch:	Integrated in the »receiver«

### 1 Single recharger for the RCI-102 and InfraLight under-the-chin receivers

Order No.: A-4977-0

Recharger for one under-the-chin receiver and two separate rechargeable batteries.

### Silicone earpieces for the RCI-102 under-the-chin receiver (also for the LPU-1 and Infra- Light)

#### 2 Standard

Order No.: A-4985-0 (2 Paar)

Order No.: A-4987-0 (24 Paar)

#### 3 Tapered shape

Order No.: A-4988-0 (2 Paar)

Order No.: A-4989-0 (24 Paar)

#### 4 Perforated

Order No.: A-4993-0 (2 Paar)

Order No.: A-4992-0 (24 Paar)

### RCI-102

Order No.: A-4043-0

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.



*Case able to accommodate  
up to 15 under-the-chin re-  
ceivers – [Description: p. 27](#)*



## InfraLight

### Infrared transmission system for small to medium-sized rooms



#### System with transmitter and two different types of receivers

With its compact transmitter and two different types of receivers, the *InfraLight* system provides convenient audio solutions for sound coverage using infrared transmission signals in small to medium-sized rooms. The receivers are equipped with mono and stereo sound as well as infinitely variable volume control.

#### 1 The *InfraLight* transmitter

Order No.: A-4022-0

The *InfraLight* transmitter is able to recharge one receiver as well as two rechargeable batteries. Directed towards the receivers and connected with an audio source, it transmits signals over a range of up to 12 metres to an unlimited number of corresponding receivers.

The *InfraLight* transmitter includes the transmitting unit with its power supply and one rechargeable battery to operate one receiver.



Case able to accommodate up to 15 under-the-chin receivers –  
[Description: p. 27](#)

#### Technical data

Modulation processes:	FM, stereo or mono
Carrier frequencies:	2.3 / 2.8 MHz
Sound frequency transmission range:	15 - 20000 Hz
Harmonic distortion:	< 1 %
Signal-to-noise ratio:	typ. 60 dB
Battery recharging time:	Approx. 14 h

#### Transmitter

Power consumption:	Approx. 3.6 VA
Power supply:	Transmitter 12 volts DC
	Mains connection 230 volts 50 Hz
Weight:	Approx. 170 g

#### *InfraLight* DIR under-the-chin receiver

Operating time depending on charge:	Approx. 7 h
Maximum volume:	Approx. 120 dBA
Weight:	55 g

#### Receiver with *InfraLight* LR teleloop

Operating time:	Approx. 6-7 h
Maximum volume:	Approx. 120 dBA
Weight:	56 g

#### 2 The *InfraLight* DIR under-the-chin receiver

Order No.: A-4042-0

The *InfraLight* DIR under-the-chin receiver is equipped with earpieces that swivel to stay firmly fixed in the user's ears even when the user moves his/her head. The flexible material fits snugly into the auditory canal to effectively subdue any other ambient noise (different silicone earpieces available, [see p. 23](#)).

#### 3 The *InfraLight* LR receiver with the teleloop

Order No.: A-4052-0

The *InfraLight* LR receiver is equipped with a teleloop that uses an induction system to transmit the TV sound directly to hearing aids or CI systems via the integrated telecoil. It is also fitted with an audio output jack – to allow the connection of headphones, for example, or for a cable connection to the hearing aid.



## Accessories for Infrared Transmission Systems

### 1 Wireless UHF101 microphone

Order No.: A-4450-0

The wireless UHF101 microphone set (PLL) can be used in combination with any of the transmission systems described in this brochure. The set consists of a handheld transmitting microphone and the receiver that transmits the signals via cable to the corresponding audio output device.

#### Technical data for the UHF101

RF transmission frequency:	16 frequencies in the range from 863 to 864 MHz
Frequency stability:	±0.005 %, PLL synthesized circuit
Modulation:	FM
Range:	Up to 100m
Distortion factor:	0.4%
Audio frequency response:	60 to 21,000 Hz, -3dB

#### Receiver

Reception type:	Dual antenna, PLL
Noise suppression:	> 90 dB
Audio output:	XLR or 6.3 mm
Power supply:	DC 22V / 400mA (AC/DC adapter included)

#### Transmitter

Transmission power:	10 mW
Power supply:	Alkaline / NiMH batteries 2xAA
Operating time:	6 - 8 h

### 2 Wireless UHF401 microphone

Order No.: A-4455-0

The 4-channel UHF401 microphone system is designed for use anywhere where up to four different speakers talk from different locations, in churches, for example.

Four independent handheld microphones transmit the voices wirelessly to the stationary receiver, which in turn feeds the signals via cable into an audio output device, such as an induction loop amplifier or an infrared or a radio-frequency transmitter.

#### Technical data for the UHF401

RF transmitting frequency:	16 frequencies in the range from 790 to 819 MHz
Frequency stability:	±0.005 %, PLL synthesized circuit
Modulation:	FM
Range:	Up to 100m
Distortion factor:	0.4%
Audio frequency response:	60 to 21,000 Hz, -3dB

#### Receiver

Reception type:	Dual antenna, PLL
Noise suppression:	> 90 dB
Audio output:	XLR or 6.3 mm / Composite signal 6.3 mm
Power supply:	DC 22V / 1.2A (AC/DC adapter included)

#### Transmitter

Transmitting power:	10mW
Power supply:	Alkaline / NiMH batteries 2xAA
Operating time:	6 - 8 h



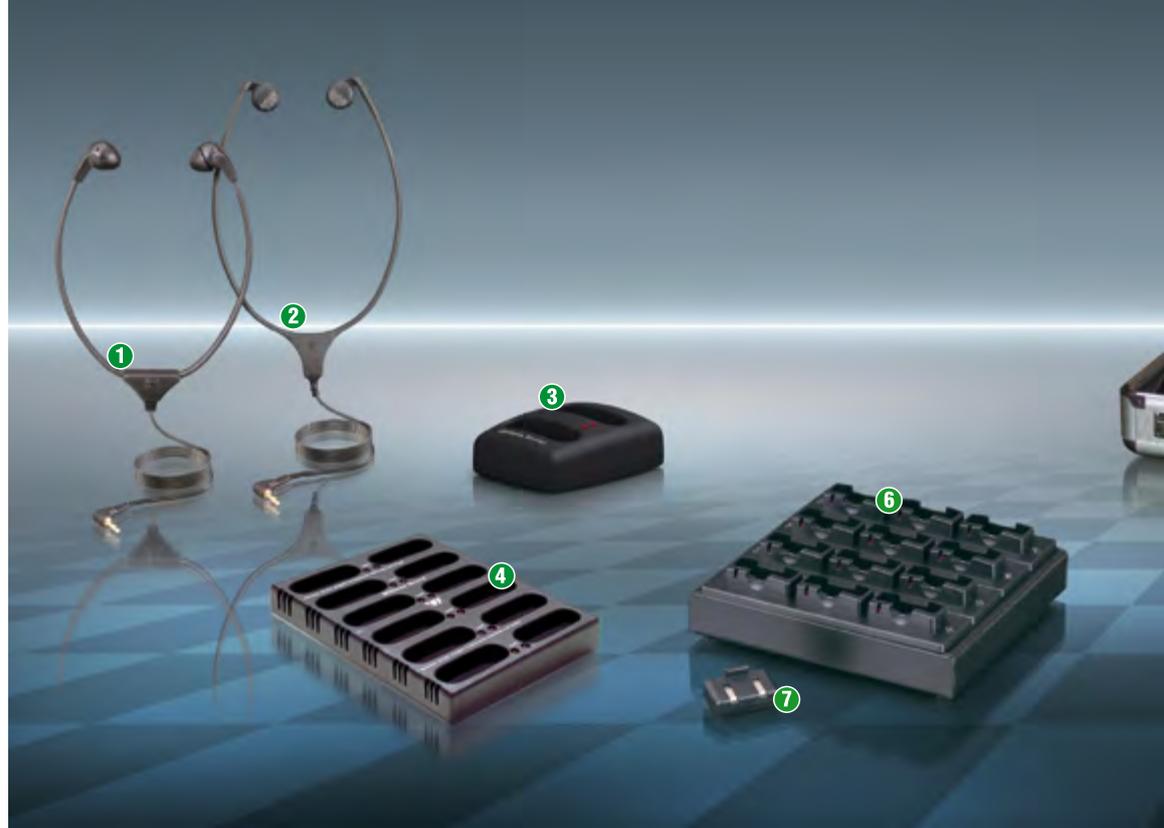
### 3 Portable pocket transmitter with PLL microphone (to be used with the UHF101 set)

Order No.: A-4460-0

The compact transmitter is worn on the body. The facilitator/speaker can clip the microphone to his/her clothing so that both hands are left free while he/she is talking.



## Accessories for infrared transmission systems



### 1 Under-the-chin receiver (closed)

Order No.: A-4903-0

Under-the-chin receiver weighing less than 30 g, which can be connected to the RX22-4 receiver – with ergonomically shaped earpieces that fit snugly into the auditory canal

### 2 Under-the-chin receiver (open)

Order No.: A-4902-0

Featherweight under-the-chin receiver (weight: < 30 g), which can be connected to the RX22-4 receiver – earpieces do not block the auditory canal

### 3 Dual recharger for the RX22-4 infrared receiver

Order No.: A-4979-0

Recharging station with two **independent** recharging bays.

### 4 12-bay recharger for the RX22-4 infrared receiver

Order No.: A-4978-0

Recharging station with 12 **independent** recharging bays.

### 5 5-bay recharger for RCI-102 and InfraLight receivers

Order No.: A-4976-0

Recharger with 5 **independent** recharging bays for the receivers.

### 6 12-battery recharger for A100 batteries

Order No.: A-4974-0

Time-saving recharger for users who operate a larger number of the receivers (InfraLight and RCI-102)

### 7 Replacement A100 battery for RCI-102 and InfraLight receivers



Order No.: A-4970-0

**8 Aluminium case designed to accommodate up to 15 under-the-chin receivers**

Order No.: A-4072-0

The tray in the case provides for the safe and reliable storage and transport of up to 15 LPU-1, RCI-102, InfraLight or RadioLight receivers. In addition, the under-the-chin receivers can also be conveniently distributed »straight from the case«.

**9 Plastic tray case for 5 under-the-chin receivers**

Order No.: A-4955-0

Transport-safe storage system – for the MK-0016-0 case, for example – for InfraLight and LPU-1 receivers.

**10 Stand to set up the TX9 and TX90 infrared receivers**

Order No.: A-4986-0

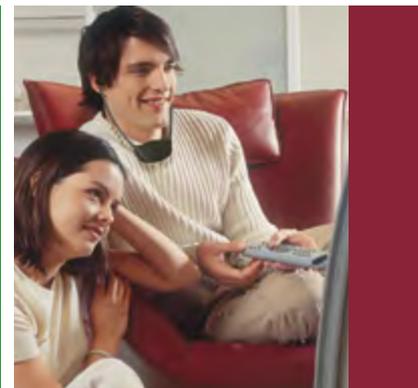
The adjustable stand is able to accommodate TX9 and TX90 transmitters.

Pulls out to a maximum of 3 m  
Maximum load 20 kg

**11 Case with 12-bay recharger\***

Order No.: A-4195-0

Safe storage and reliable transport of up to 12 RX22-4 infrared receivers incl. A-4978-0 recharger.



**Accessories for infrared transmission systems**

\* Batteries must be ordered separately. 2 batteries per device.

Order No.: EG4601-0



## Function and use of radio-frequency transmission systems

### RF transmission systems

Of all the wireless transmission technologies, radio-frequency transmission has been around for the longest time. Not surprisingly, then, it is also the most common, and with respect to audio transmission systems for accessible sound, it proves to be the most powerful system with the largest ranges of coverage.

The basic configuration of a radio-transmission system consists of a transmitter and at least one receiver. The transmitter, which is connected to an audio source – to a microphone system or any other audio system, for example – picks up the audio signals to transmit them wirelessly to the receivers.

The receivers can be equipped with teleloops, which provide for the inductive transmission of the signals to the hearing aid.

Amplifying receivers with audio output jacks are also available and can be connect to the earphones or headphones.

### Areas of application

Radio-frequency audio transmission systems have already become well established as wireless headphones or TV listening systems in the home environment.

The systems described in this brochure, however, go above and beyond this, most importantly because they have been designed for professional applications – for example:

- in sport arenas or at other spacious event venues,
- in churches and other assembly halls,
- in lecture or seminar rooms, as in schools and universities,

- and for open-air applications in particular, there is hardly an alternative to radio-frequency transmission.

In addition to these stationary applications, portable, so-called tour-guide systems have also proven useful in many areas. Some of the areas they can be used in include

- museums, art galleries,
- tourist attractions and special events
- or transportation.

The availability and use of several channels makes it possible to provide different information at the same time, for simultaneous interpreting into different languages, for example, or for the treatment of different topics for several listening groups located close to one another.

*Due to their ability to provide large coverage and independence from floor plans and architectural structures, radio-frequency transmission systems are also ideally suited to open-air applications.*

*Radio-frequency signals are able to easily pass through walls. The listeners can leave the room in which the transmitter is installed at any time without any problem and their RF receivers will continue to provide them with the information they need.*



### **Outstanding features of radio-frequency transmission technology**

- Transmitter and receiver do not require a direct »line of sight«. Radio waves can pass easily through normal house and building walls. Listeners take the sound along, even when they leave the room in which the transmitter is installed.
- This means that even very large areas can be easily supplied with audio signals.
- It is relatively easy to install RF transmitters, which also makes it inexpensive. The costs for installation and hardware do not increase in proportion to the size of the area that requires coverage.
- The transmitters can be installed inconspicuously (except in metal enclosures) and do not mar or spoil the overall architectural picture.



- Sunlight, artificial light and the reflection conditions inside rooms do not affect transmission.
- RF transmission systems are easy and convenient to use, they are very portable and, with multi-channel functionality, they are very flexible in their uses and applications.

#### **Coverage**

With respect to coverage, RF transmission systems are far superior to the two other transmission technologies described in this brochure.

With coverage ranges of up to more than 300 metres, it is possible to easily supply even large arenas with audio signals. The transmission distances of tour-guide systems with approximately 30 metres makes it possible to supply information even in large groups or groups in different locations.

#### **Factors influencing the operation of radio-frequency transmission technology**

- Other RF systems or electromagnetic emissions could have a negative effect on transmission and signal quality.
- Users must make sure that their transmission channels are set correctly.

- Some countries charge radio-licensing fees for the use of these systems. In this context, it cannot be ruled out that the national regulations in some countries only release certain frequency ranges for these systems (different from the standard).

#### **More useful information on the use of radio-frequency transmission systems**

- Users of audio radio-frequency transmission systems should be aware of the fact that the coverage ranges or the signal scattering go beyond the intended coverage areas. As a result, there is no guarantee that the information transmitted will remain confidential.
- When planning the parallel use of this type of system – in neighbouring rooms, for example – the transmission must be made on different channels (compare the number of channels available with the number of channels required).



**An attractively priced, functional solution designed to provide large areas with audio signals**



## The portable 3-channel transmission system

### T863 transmitter

#### Convenient radio-frequency transmission system for

- guided tours
- simultaneous selective transmission of different languages
- clear understanding, even in noisy environments or under other unfavourable acoustic conditions

The minimum configuration of a three-channel audio RF system with compact, easy-to-use transmission and reception components includes a transmitter (T863) with a microphone\* and a receiver (R863).

This system can be used as a tour-guide system and allows simultaneous transmission in multiple languages with three different frequency channels. Audio signal processing puts emphasis on the voice frequencies rather than on the annoying background noise.

#### T863 portable transmitter

**Order No.: A-4170-0**

The portable T863 broadband RF transmitter can be clipped to a belt. An impact-resistant plastic enclosure protects the audio and transmission technology. The signals are transmitted via a two-inch antenna and the device is also equipped with a 3.5-mm input jack for the connection of a microphone or microphone headset\*.



#### Technical data: T863 transmitter

Dimensions (H x W x D):	155 x 72 x 30 mm
Weight:	82 g (without batteries)
Colour:	Black
Material:	ABS / polycarbonate, impact-resistant, unbreakable
Batteries:	2x AA 1.5V alkaline batteries, uninterrupted power supply for approx. 20 h or 2xAA 1.2V NiMH rechargeable batteries, uninterrupted power supply for approx. 15 h
Charging times:	Approx. 14 to 16 h when using the CHG 3512 recharger
Operating frequencies:	Channel 1: 863.25 MHz; Channel 2 : 863.75 MHz; Channel 3: 864.75 MHz (±30 kHz)
Range:	30 metres when using the R863 receiver
Stability:	± 0.5 MHz, 0 – 50 °C
FM deviation:	60 kHz ± 5 kHz, transmission input at 1 kHz, 2.5 mV
Noise reduction:	50 µS
Sensitivity:	< - 90 dBm at 60 kHz deviation
RF output:	5 - 10 dBm
Response frequency:	500 Hz – 5 kHz, ± 3 dB
Distortion:	< 2.0 % THD
Transmission antenna:	5 cm
Recommended microphone*:	MIC 096 microphone headset
Microphone connection:	3.5-mm jack
Recharging contacts:	Compliant with CHG 3512 battery recharger
Certifications:	CE, ROHS, WEEE, ETSI EN 301 357-1, ETSI EN 301 357-2

Internal »mic gain control« guarantees a well-balanced microphone signal. The transmitter is equipped with three frequency channels that the user can choose from. The channel selection switch is also the on/off switch.

The »power-on LED« flashes to indicate a low battery early.

Depending on the battery type, the R863 receiver provides for uninterrupted reception for up to 20 hours.

When the R863 receiver is used, the T863 transmitter has a range of approx. 30 metres.

\* Microphone not included, see Accessories, [Page 36](#): MIC 096 headset microphone, MIC 014-R plug-in microphone.



## R863 RF receiver with channel selection

### Technical data for the R863 receiver

Dimensions (H x W x D):	115 x 72 x 30 mm
Weight:	85 g (without batteries)
Colour:	Black
Material:	ABS / polycarbonate, impact-resistant, unbreakable
Batteries:	2x AA 1.5V alkaline batteries, uninterrupted power supply for approx. 20 h or 2xAA 1.2V NiMH rechargeable batteries, uninterrupted power supply for approx. 15 h
Recharging times:	Approx. 14 to 16 h using the CHG 3512 recharger
Operating frequencies:	Channel 1: 863.25 MHz; Channel 2 : 863.75 MHz; Channel 3: 864.75 MHz ( $\pm 30$ kHz)
Range:	30 metres using the T863 transmitter
Stability:	$\pm 0.5$ MHz, 0 – 50 °C
FM deviation:	60 kHz $\pm 5$ kHz, transmission input at 1 kHz, 2.5 mV
Noise reduction:	50 $\mu$ S
Noise cut-off:	-100 dB at 6 kHz
RF output:	5 – 10 dBm
Response frequency:	500 Hz – 5 kHz, $\pm 3$ dB
Distortion:	< 2.0 % THD
Signal-to-noise ratio:	> 50 dB ( $\pm 5$ dB) with transmission input at 1 kHz, 2.5 mV
Connections:	3.5-mm jack headphones (recommended: HED 021) or teleloop
Recharging contacts:	Compliant with the CHG 3512 battery recharger
Certifications:	CE, ROHS, WEEE, ETSI EN 301 357-1, ETSI EN 301 357-2

The earphones, headphones or a teleloop can be connected via the 3.5-mm audio output. As an alternative to the portable transmitter, there is also a transmitter for stationary installation (see next page), **Order No.: A-4171-0**.



### R863 portable RF receiver

**Order No.: A-4172-0**

The portable RF receiver for the tour-guide system is equipped with a belt clip; as for the transmitter, the enclosure is made of impact-resistant plastic and has a connection jack for mono or stereo headphones. The volume is controlled by a knob, which is also the on/off switch. The LED, which lights up permanently when the device is switched on, will begin to flash to indicate a low battery.

Depending on the type of battery used, the R863 receiver provides uninterrupted reception for up to 20 h.

In combination with the T863 tour-guide transmitter, the R863 receiver guarantees reliable reception over a distance of approx. 30 metres.



## T800

### Radio transmitter in stand enclosure, range up to 120 metres

#### Suitable areas of application:

- Churches, assembly halls
- Schools and other educational facilities
- Theatres, spectator and viewer rooms
- Conference and meeting rooms
- Open-air events, e.g. open-air theatres



#### »T800« transmitter

Order No.: A-4171-0

The T800 RF transmitter transmits the speaker's voice, a music program or the signals from any other audio source wirelessly over a distance of up to 120 m.

Installation and operation of the transmitter are convenient and easy – »plug & play«: connect the microphone or audio system to the XLR or 6.3 mm plug, switch on the transmitter – and the system is ready to go. An LCD display guides the user through the menu.

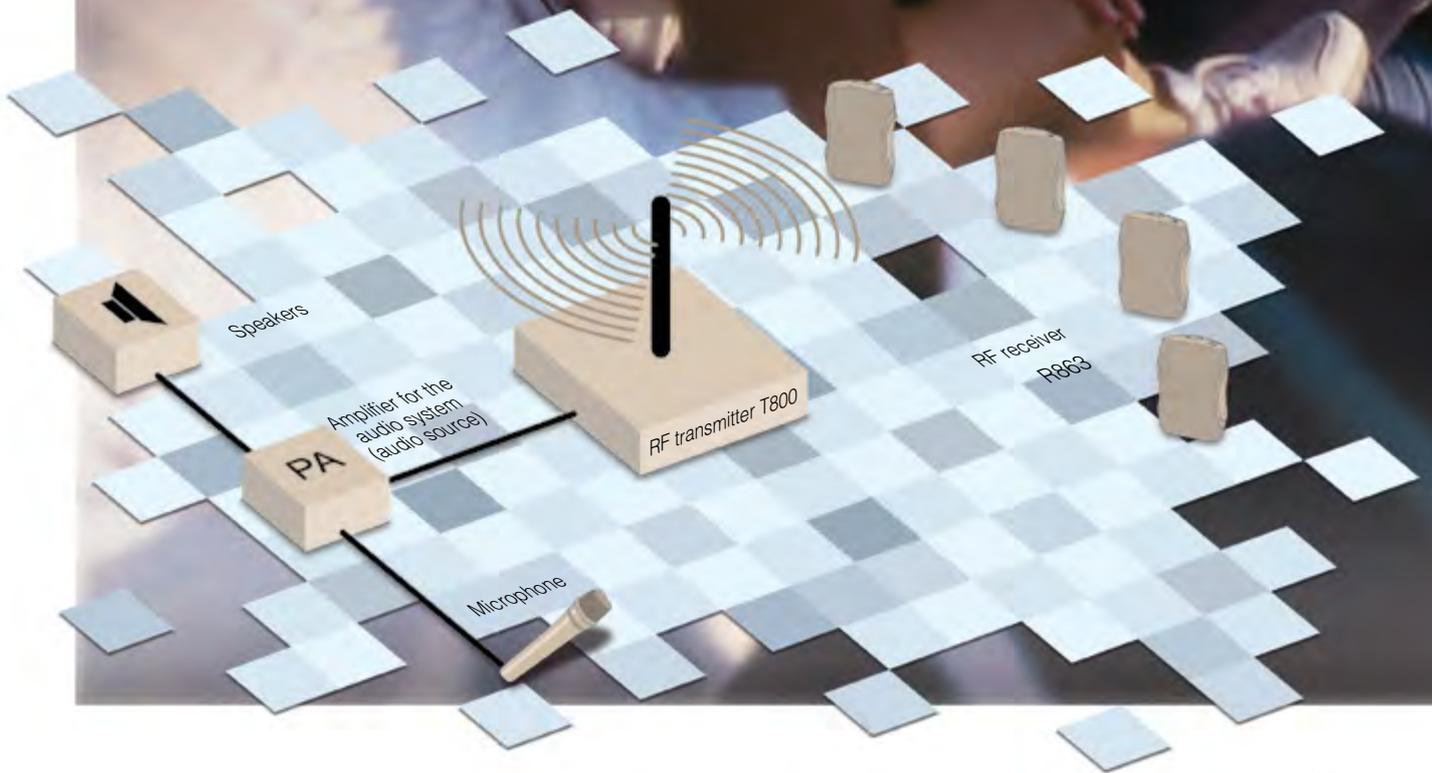
The T800 operates on three frequency channels: 863.250 / 863.750 and 864.750 MHz. This means that it is also possible to transmit up to three different languages, which the listeners using the R863 FM receiver ([see p. 31](#)) can select as they wish.

The T800 transmits one channel only. To transmit three different languages, it would be necessary to use three T800 devices.

#### Technical data

Dimensions (H x W x D):	4.6 x 21.8 x 21.8 cm
Weight:	1320 g
Colour:	Black
Power supply:	AC: 100 to 240 V AC, 50-60 Hz, 400 mA DC: 12 to 13 VDC, 800 mA
Temperature range:	0 °C to 40 °C (storage temperature: -20 °C to 70 °C)
Operating frequencies:	Channel 1 = 863.250 MHz / Channel 2 = 863.750 MHz, Channel 3 = 864.750 MHz
RF output:	5 to 10 dBm
Stability:	±0.5 MHz (0 °C to 40 °C)
FM deviation:	45 KHz (transmission input, L+R, 1 kHz, 0.5 Vrms)
Noise reduction:	50 µsec
Range:	Up to approx. 120 metres (for R863 receivers)
Response frequency:	LINE-IN: 25 to 10.1 KHz ±3 dB MIC-IN: 110 to 8.5 KHz ±3 dB
Signal-to-noise ratio (1 KHz):	LINE-IN: > 50 dB MIC-IN: > 40 dB
THD + noise (1 KHz):	LINE-IN: < 0.4% MIC-IN: < 0.5%
Audio processing:	2:1 compression (LINE or MIC-IN)
Audio inputs:	LINE: mono, RCA plug (2 x) MIC: Combo XLR (3-pin) or 6.3-mm-TRS plug.
Audio level:	(for FM deviation) LINE-IN: 0.5 Vrms (-6 dBV)
Microphone input:	10 Vrms (-40 dBV)
Common mode rejection:	MIC-IN: > 22 dB at 1 KHz
Antenna:	22.9 cm long, flexible, adjustable, removable
Certifications:	CE, ROHS, WEEE, ETSI EN 301 357-1, 2

With a range of more than 100 metres, the transmitter is able to provide even large venues with audio signals, from conference rooms to lecture halls and from open-air stages right on up to sport arenas.





## CM-1

### Portable 3-channel radio-frequency transmission system

#### Convenient in its operation ...

- ... from a personal communications system with one transmitter and one receiver right on up to guided tours in larger groups
- easy to understand, even in noisy environments or under less-than-perfect acoustic conditions



Order No.: A-4313-0

The CM-1 case for the storage and transport of the CM-1 system is equipped with 10 recharging bays for transmitters and receivers that also serve as compartments for safe transport.



#### 1 CM-1 FM transmitter (incl. 2 rechargeable batteries)

Order No.: A-4320-0

#### 2 CM-1 FM receiver with teleloop (incl. 1 rechargeable battery)

Order No.: A-4340-0

#### 3 CM recharger for CM-1

Order No.: A-4951-0

CM-1 – that's the portable 3-channel FM system that is easy to understand – in conversation, during guided tours or at panel discussion or hosted events. The system consists of a transmitting microphone and any number of separate receivers. The components can be used to cover distances of up to 30 metres.

The speaker can wear the microphone on a neck cord or place it nearby, on a table, for example. The microphone transmits the signals it receives via radio waves to the receivers, which the listeners wear or carry.

#### Three channels to select

CM-1 is equipped with three radio channels to choose from so that up to three CM-1 systems can be active at the same time without interfering with one another.

#### Technical data: CM-1 transmitter

Dimensions (H x W x D):	19 x 37x120 mm
Weight:	64 g
Power supply:	2x 1.2V NiMH rechargeable batteries (LR03)
Charging time (fully discharged):	Max. 12-14h
Operating time (depending on use):	Max. 10-12h
Carrier frequencies:	Channel A: 863.5 Mhz Channel B: 864.0 Mhz Channel C: 864.5 Mhz

#### CM-1 receiver

Dimensions (H x W x D):	20 x 39 x 96 mm
Sound pressure level for headphones:	Max. 118 dB
Weight:	45 g
Power supply:	1x 1.2 V NiMH rechargeable batteries (LR03)
Charging time (fully discharged):	Max. 12-14h
Operating time (depending on use):	Max. 8-10h

#### CM recharger

Dimensions (H x W x D):	67 x 83 x 65 mm
Weight:	94 g
Power supply via mains connection:	Primary 220/230 V 50-60 Hz AC / Secondary 12 V DC

#### Convenience in operation, flexibility in use

The CM system transmits the audio signals inductively via the teleloop to the hearing aids. The CM-1 receivers are also equipped with an audio output jack.

Operation is easy and quick to learn. As a result, listeners can make their own individual settings as soon as they get their receivers. A knob is used to adjust the volume to any level desired, while a treble-bass switch makes it possible to adjust the tone.

Equipped with an acoustic zoom function and an omnidirectional setting (spatial hearing), the directional microphone is able to provide the suitable angle for sound reception for a variety of different situations.

#### Outstanding voice quality

DSP technology processes the audio signals in real time on the basis of audiological criteria. Any undesirable ambient noise is suppressed and voice frequencies are accentuated. The AGC function (Automatic Gain Control) controls the adjustment of the volume to the current acoustic situation.



## RadioLight II

### Stationary 3-channel transmission system

#### Technical data

Modulation process:	FM
Carrier frequencies:	Channel A: 863.25 MHz Channel B: 863.75 MHz Channel C: 864.75 MHz
Transmission power:	10 mW
Sound frequency transmission range:	15 - 20000 Hz
Distortion factor:	< 1 %
Signal-to-noise ratio:	typ. 60 dB
Battery recharging time:	Approx. 6 h

#### Transmitter

Power consumption:	Approx. 3.6 VA
Power supply:	Transmitter 12 volts DC Mains connection 100-240 VAC 50/60 Hz
Weight:	Approx. 200 g

#### RadioLight DIR II under-the-chin receiver

Operating time depending on battery charge:	Approx. 4-5 h
Maximum volume:	Approx. 120 dBA
Weight:	Approx. 59 g

#### Receiver with RadioLight LR II teleloop

Operating time depending on battery charge:	Approx. 4-5 h
Maximum volume:	Approx. 120 dBA
Weight:	Approx. 59 g

#### 3-channel system with transmitter and two different types of receivers

Three individually selectable channels on the transmitter and the receivers make it possible to operate the system on three transmission paths with separate frequencies that remain »isolated« from one another – ideal for simultaneous interpreting in different languages or for the operation of several systems at different event venues that are various distances apart.

The RadioLight II system with its transmitter and two different types of receivers makes it possible to create convenient audio solutions that are able to provide sound coverage for a range of up to approx. 80 metres. The receivers are equipped with a mono- and stereo switch as well as infinitely variable volume control.

#### 1 The RadioLight II transmitter

Order No.: A-4123-0

The RadioLight II transmitter includes a recharging bay for one receiver and two recharging inserts for separate batteries.

#### 2 The RadioLight DIR II under-the-chin receiver

Order No.: A-4154-0

The ergonomically designed RadioLight DIR II under-the-chin receiver is equipped with earpieces that swivel to stay firmly fixed in the user's ears even when the user moves his/her head. The flexible material fits snugly into the auditory canal to effectively subdue any other ambient noise (different silicone earpieces available, see [p. 36/ 37](#)).

#### 3 Receiver with RadioLight LR II teleloop

Order No.: A-4160-0

The RadioLight LR II receiver is equipped with a teleloop that uses an induction system to transmit the audio signal directly to hearing aids or CI systems via the integrated telecoil. It is also fitted with an audio output jack – to allow the connection of headphones, for example, or for a cable connection to the hearing aid.

The transmitter can also be used as a battery recharger. A microprocessor-controlled intelligent recharging switch (with charging status indicator) increases battery service life and guarantees short recharging times.



The transmitter includes the transmitter itself with the power supply unit, one battery to operate one receiver and an audio connection cord.



Case able to accommodate up to 15 under-the-chin receivers – [Description: p. 27](#)



## Accessories for radio-frequency transmission systems



### 1 MIC 096 headset microphone

Order No.: A-4481-0

Headset with condenser directional microphone:

- Noise suppression
- 1-metre cable
- Compatible with the T863 receiver

### 2 MIC 014-R plug-in microphone (omnidirectional) for the portable T863 radio-frequency transmitter

Order No.: A-2976-0

### 3 HED 021 headphones

Order No.: A-4913-0

»Deluxe« headphones for adults:

- 3.5-mm plug to connect the R863 radio-frequency receiver.
- 1-metre cable

### 4 Under-the-chin receiver (open)

Order No.: A-4902-0

- Featherweight under-the-chin receiver (weight: < 30 g) for connection to the R863 receiver
- Earpieces do not block the auditory canal.

### 5 Under-the-chin receiver (closed)

Order No.: A-4903-0

- Under-the-chin receiver weighing less than 30 g for connection to the R863 receiver
- Ergonomically designed earpieces that fit snugly into the auditory canal



## Accessories for radio-frequency transmission systems

**Silicone earpieces for LPU-1 under-the-chin receivers (closed) A-4903-0 (also for RCI-102, InfraLight, RadioLight)**

### 6 Standard

Order No.: A-4985-0 (2 Paar)

Order No.: A-4987-0 (24 Paar)

### 7 Tapered shape

Order No.: A-4988-0 (2 Paar)

Order No.: A-4989-0 (24 Paar)

### 8 Perforated

Order No.: A-4993-0 (2 Paar)

Order No.: A-4992-0 (24 Paar)

### 9 Teleloop

Order No.: A-4922-0

- Teleloop for connection to the R863 receiver
- Inductive audio transmission to hearing aids or CI systems via the T-coil (switch set to »T« or »MT«)

### 10 Carrying strap for the T863 and the R863

Order No.: A-4918-0

### 11 Case for one stationary transmitter and 10 receivers

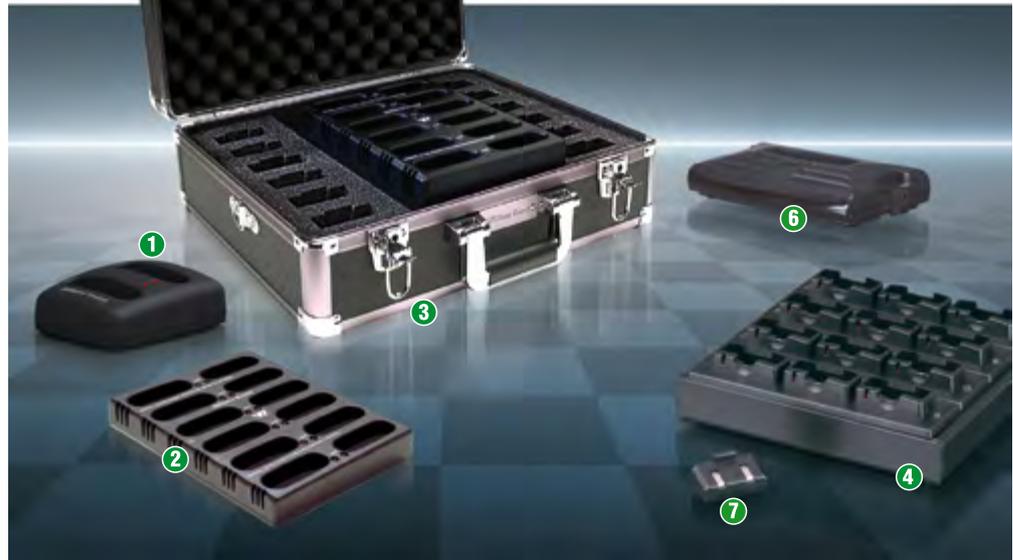
Order No.: A-4190-0

The CCS 030 S heavy-duty case is ideal for the professional storage and safe transport.

The case made of hard plastic with metal edging and rubber foam on the interior is able to accommodate one transmitter, the T 800 for example, and 10 RF receivers (R863 or RX22-4).



## Accessories for radio-frequency transmission systems



The HUMANTECHNIK program includes single and multiple-battery rechargers for all the systems. Depending on the product group, the transmitters and receivers are either inserted completely into the rechargers or the batteries are removed and inserted separately. For users who want to lend the corresponding receivers to visitors for a limited time during an event, we recommend using multiple-battery rechargers to keep recharging time and trouble to a minimum.

HUMANTECHNIK transport and recharging cases are available for the safe, reliable transport of these components.



\* Batteries must be ordered separately.  
2 batteries per device.

Order No.: EG4601-0

### 1 Recharger for 2 R863 / T863 radio-frequency units\*

Order No.: A-4979-0

Recharger with 2 **independent** recharging bays.

### 2 CHG3512 12-battery recharger\*

Order No.: A-4978-0

For users who operate a larger number of R863 or R22-4 receivers, we recommend using this time-saving recharger, which is equipped with 12 independent recharging bays. It takes approx. 16 hours to recharge the original receiver batteries.

### 3 Case with 12-battery recharger\*

Order No.: A-4195-0

Safe and reliable transport and storage of up to 12 R863 receivers incl. the A-4978-0 recharger.

### 4 12-battery recharger for A100 batteries

Order No.: A-4974-0

Time-saving recharger for users who operate a larger number of under-the-chin receivers for the RadioLight system.

### 5 5-bay recharger for RadioLight receivers

Order No.: A-4976-0

Recharger with 5 **independent** recharging bays for RadioLight receivers.

### 6 Single-bay recharger for a RadioLight receiver

Order No.: A-4977-0

When the RadioLight receiver is not in use, the user can place it in the recharger.

### 7 Replacement A100 battery for RadioLight receivers

Order No.: A-4970-0

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## Keyword list from A to Z



**Welcome to  
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mission systems**



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