



IEM 150

UHF wireless system

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1 General notes

This user manual contains important information on safe operation of the device. Read and follow all safety notes and all instructions. Save this manual for future reference. Make sure that it is available to all persons using this device. If you sell the device, include the manual for the next owner.

Our products are subject to a process of continuous development. We therefore reserve the right to make changes without notice.

Symbols and signal words

This section provides an overview of the symbols and signal words used in this user manual.

Signal word	Meaning
DANGER!	This combination of symbol and signal word indicates an immediate dangerous situation that will result in death or serious injury if it is not avoided.
CAUTION!	This combination of symbol and signal word indicates a possible dangerous situation that can result in minor injury if it is not avoided.
NOTICE!	This combination of symbol and signal word indicates a possible dangerous situation that can result in material and environmental damage if it is not avoided.
Warning signs	Type of danger
	Warning – high-voltage.
	Warning – danger zone.

2 Safety instructions

Intended use

This device is intended to be used for the wireless transmission of audio signals to earplugs. Use the device only as described in this user manual. Any other use or use under other operating conditions is considered to be improper and may result in personal injury or property damage. No liability will be assumed for damages resulting from improper use.

This device may be used only by persons with sufficient physical, sensorial, and intellectual abilities and having corresponding knowledge and experience. Other persons may use this device only if they are supervised or instructed by a person who is responsible for their safety.

Safety



DANGER!

Danger for children

Ensure that plastic bags, packaging, etc. are disposed of properly and are not within reach of babies and young children. Choking hazard!

Ensure that children do not detach any small parts (e.g. knobs or the like) from the unit. They could swallow the pieces and choke!

Never let children unattended use electrical devices.



DANGER!

Electric shock caused by high voltages inside

Within the device there are areas where high voltages may be present. Never remove any covers.

There are no user-serviceable parts inside.

Do not use the device if covers, protectors or optical components are missing or damaged.



DANGER!

Electric shock caused by short-circuit

Always use proper ready-made insulated mains cabling (power cord) with a protective contact plug. Do not modify the mains cable or the plug. Failure to do so could result in electric shock/death or fire. If in doubt, seek advice from a registered electrician.



CAUTION!

Possible hearing impairment

The use of earphones at high volume over a longer period of time can cause permanent hearing damage.

Adjust the output volume of your audio device to a medium value and use the earphones no longer than about one hour a day.



NOTICE!

Operating conditions

This device has been designed for indoor use only. To prevent damage, never expose the device to any liquid or moisture. Avoid direct sunlight, heavy dirt, and strong vibrations.



NOTICE!

External power supply

The device is powered by an external power supply. Before connecting the external power supply, ensure that the input voltage (AC outlet) matches the voltage rating of the device and that the AC outlet is protected by a residual current circuit breaker. Failure to do so could result in damage to the device and possibly the user.

Unplug the external power supply before electrical storms occur and when the device is unused for long periods of time to reduce the risk of electric shock or fire.



NOTICE!

Risk of fire due to incorrect polarity

Incorrectly inserted batteries may destroy the device or the batteries.

Ensure that proper polarity is observed when inserting batteries.



NOTICE!

Possible damage by leaking batteries

Leaking batteries can cause permanent damage to the device.

Take batteries out of the device if it is not going to be used for a longer period.

3 Features and scope of delivery

The UHF wireless system IEM 150 is suitable as an in-ear monitoring system especially for professional events, on rock stages and in concert halls, theatres and musicals.

**the t.bone IEM 150 640 MHz
(item No. 439536)**

Your UHF wireless system IEM 150 640 MHz consists of the following components:

- 9.5" stereo transmitter IEM 150 T
 - Very high sensitivity at very high signal-to-noise ratio
 - Signal inputs: two XLR sockets
 - Output for headphones (3.5 mm and 6.35 mm phone jack) with adjustable volume
 - Two outputs for transmitting the input signal to other audio devices (6.35 mm phone jack)
 - Power supply via supplied power adapter
- Bodypack receiver IEM 150 R 640 MHz (also available separately; article No. 439541)
 - Earplug outlet (1/8" mini phone socket) with volume control
 - Control for volume and balance
 - Voltage supply: 2 AA cells (LR6, 1.5 V)
- Earphone EP 4

8 systems can be operated simultaneously. The system operates within a frequency range of 640 MHz to 665 MHz, divided into three frequency groups.

Included accessories: earplugs in various sizes and fastening material for rack mounting

the t.bone IEM 150 823 MHz (item No. 439537)

Your UHF wireless system IEM 150 823 MHz consists of the following components:

- 9.5" stereo transmitter IEM 150 T
 - Very high sensitivity at very high signal-to-noise ratio
 - Signal inputs: two XLR sockets
 - Output for headphones (3.5 mm and 6.35 mm phone jack) with adjustable volume
 - Two outputs for transmitting the input signal to other audio devices (6.35 mm phone jack)
 - Power supply via supplied power adapter
- Bodypack receiver IEM 150 R (also available separately; article No. 439542)
 - Earplug outlet (1/8" mini phone socket) with volume control
 - Control for volume and balance
 - Voltage supply: 2 AA cells (LR6, 1.5 V)
- Earphone EP 4

4 systems can be operated simultaneously. The system operates within a frequency range of 823 MHz to 832 MHz, divided into four frequency groups.

Included accessories: earplugs in various sizes and fastening material for rack mounting

**the t.bone IEM 150 863 MHz
(item No. 439539)**

Your UHF wireless system IEM 150 863 MHz consists of the following components:

- 9.5" stereo transmitter IEM 150 T
 - Very high sensitivity at very high signal-to-noise ratio
 - Signal inputs: two XLR sockets
 - Output for headphones (3.5 mm and 6.35 mm phone jack) with adjustable volume
 - Two outputs for transmitting the input signal to other audio devices (6.35 mm phone jack)
 - Power supply via supplied power adapter
- Bodypack receiver IEM 150 R (also available separately; article No. 439543)
 - Earplug outlet (1/8" mini phone socket) with volume control
 - Control for volume and balance
 - Voltage supply: 2 AA cells (LR6, 1.5 V)
- Earphone EP 4

2 systems can be operated simultaneously. The system operates within a frequency range of 863 MHz to 865 MHz, divided into four frequency groups.

Included accessories: silicon ear pads and fastening material for rack mounting

4 Installation

4.1 General Information

Unpack and check carefully there is no transportation damage before using the unit. Keep the equipment packaging. To fully protect the product against vibration, dust and moisture during transportation or storage use the original packaging or your own packaging material suitable for transport or storage, respectively.

Create all connections while the device is off. Use the shortest possible high-quality cables for all connections. Take care when running the cables to prevent tripping hazards.

Notes on wireless transmission

- This device utilizes frequencies that are not harmonized within the European Union (EU) and therefore may only be used in certain EU member states. In all European countries, the frequencies used for the transmission of audio signals are strictly regulated. Before you start, make sure the frequencies are allowed in the respective country and check whether the operation must be reported to the appropriate authority.
For more information, please visit: <http://www.thomann.de>.
- Make sure that transmitter and receiver are both tuned to the same channel.
- Never set multiple transmitters to the same channel.
- Make sure that there are no metal objects between the transmitter and receiver.
- Avoid interference from other radio or in-ear systems.

4.2 Transmitter

Rack mounting

The unit has been designed for rack mounting in a standard 9.5" rack; it occupies one rack unit. The fixing material required for assembly is included.

Attaching the antenna

Attach the included antenna to the rear panel of the transmitter. To improve the transmission quality and to adapt to the spatial conditions it is rotatable and swivelling.

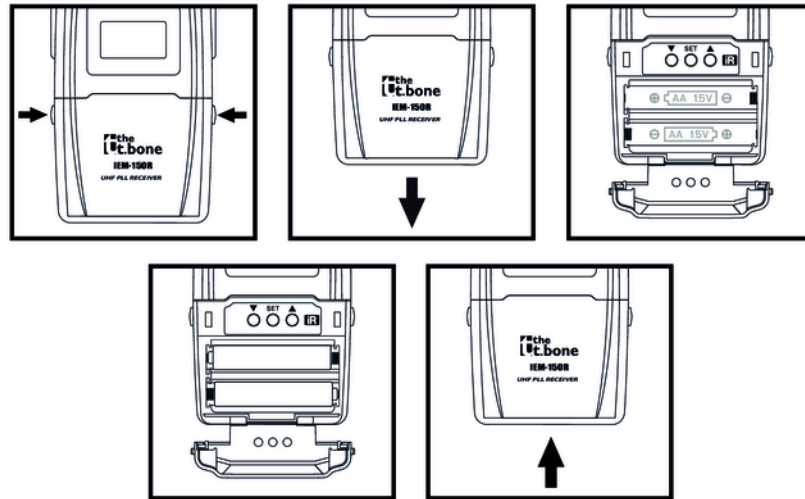
Connecting audio and starting up

Connect the audio inputs of the transmitter with suitable line outputs of your mixer or your amplifier. Set the controls for the volume (6) first to a middle position.

To get the best sound quality, a fine adjustment of the controller may be required. If the input level is too high, switch the noise dampening function on.

4.3 Receiver

Inserting batteries into the receiver



Ensure that the main switch / volume control (16) on the receiver is in the "OFF" position.

Press simultaneously on the two side closures on the battery compartment, pull it gently downwards and then fold it completely up. Insert the batteries. Pay attention to the correct location of the poles.

Fold the battery compartment closed until it engages.

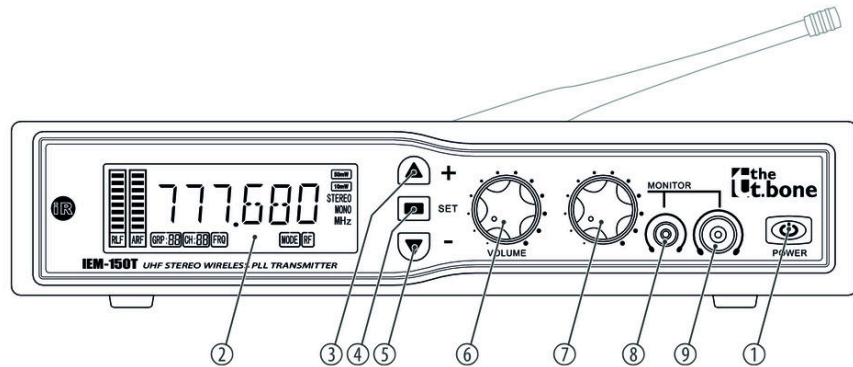
4.4 Taking system in operation

- 1.** ➤ Ensure that the transmitter and receiver are switched off. The display on the transmitter is dark; on the receiver, the main switch / volume control is in the "-" position.
- 2.** ➤ Attach the receiver with the clip to your belt or guitar strap.
- 3.** ➤ Carefully insert the ear phones into the ear canal, note the markings 'L' and 'R' for the left and right side.
- 4.** ➤ Connect the ear phones to the receiver.
- 5.** ➤ Switch the transmitter on by pressing the main switch and the receiver by turning the main switch / volume control and test the transmission. Make sure that transmitter and receiver are set to the same frequency group and channel. If necessary, adjust the amplification of the transmitter and receiver and the levels on your mixing console or your amplifier.

5 Connections and controls

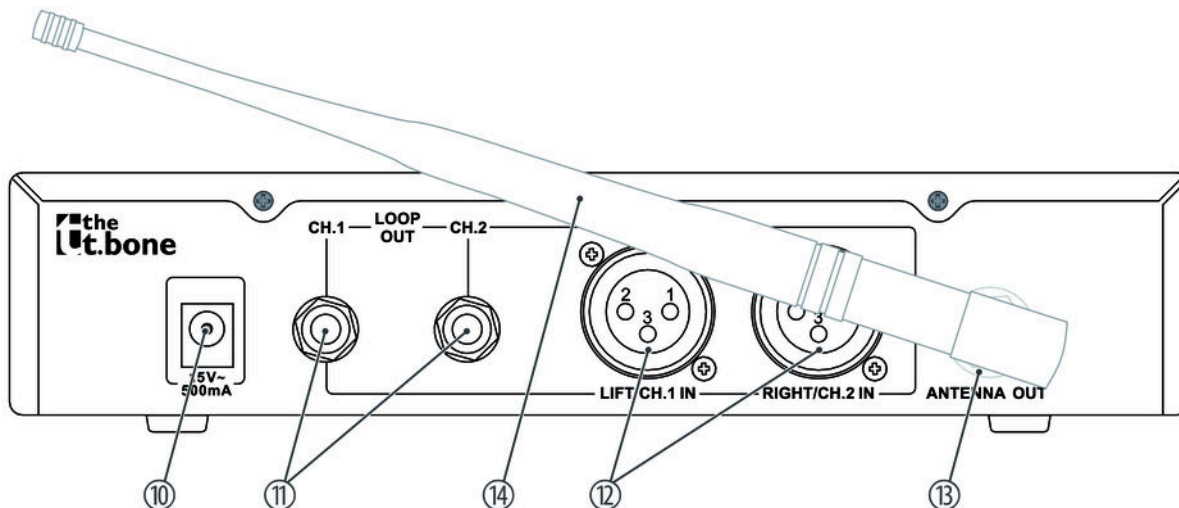
5.1 Transmitter

Front panel of transmitter



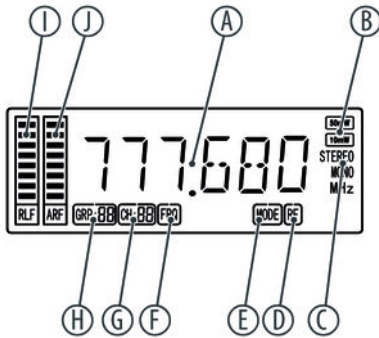
1	<i>[POWER]</i> Main switch. Turns the device on and off. Press this button for about 1 second to switch the device on.
2	Display.
3,5	<i>[+] / [-]</i> Buttons for increasing / decreasing the currently indicated value.
4	<i>[SET]</i> Enter button for menu control
6	<i>[VOLUME]</i> Volume control
7	<i>[MONITOR]</i> Volume control for headphone output
8	3.5 mm phone socket (stereo) to connect headphones
9	6.35 mm phone socket (stereo) to connect headphones

Rear panel of transmitter



10	Connector for the supplied power supply adapter
11	<i>[LOOP OUT CH1, CH2]</i> 6.35 mm phone sockets (mono). Outputs for forwarding the audio signal to other in-ear transmitters or monitor boxes.
12	<i>[LEFT CH.1 IN] / [RIGHT CH.2 IN]</i> XLR jack (left and right channel) for direct connection to a mixing console or any other audio device that serves as signal source.
13	<i>[ANTENNA OUT]</i> BNC-type chassis socket for the supplied UHF antenna. Make sure that the frequency indicated on the antenna is within the range that is indicated on the transmitter.
14	UHF antenna

Transmitter display

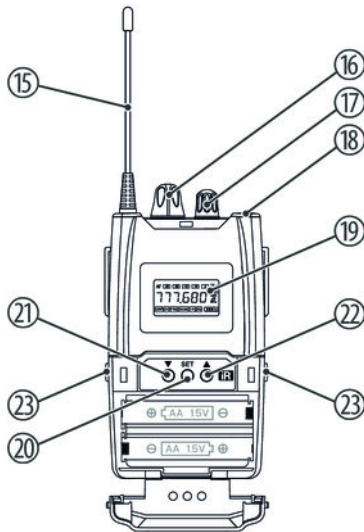


A	Indicates the frequency that is assigned to the set combination of frequency group and channel.
B	<i>[10mW] / [50mW]</i> Indicates the set transmitter power.
C	<i>[STEREO] / [MONO]</i> Indicates the set operating mode (stereo or mono).
D	<i>[RF]</i> Flashes if the transmitter power is being adjusted.
E	<i>[MODE]</i> Flashes if the operating mode is being adjusted.
F	<i>[FRQ]</i> Flashes if the frequency is being adjusted.
G	<i>[CH]</i> Flashes if the channel is being adjusted.

H	<i>[GRP]</i> Flashes if the frequency group is being adjusted.
I	<i>[RLF]</i> Level display for the left channel.
J	<i>[ARF]</i> Level display for the right channel.

5.2 Receiver

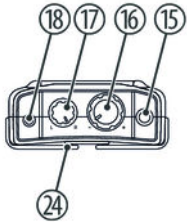
Front panel of the receiver



15	Flexible antenna.
16	[- / +] Main switch and volume control. Turn this control clockwise past the point of resistance to turn on the receiver. Turn it further to increase the volume. Turn this control counter-clockwise to reduce the volume. Turn it further past the point of resistance to turn off the receiver.
17	[L/R] Pan control
18	3.5 mm phone socket (stereo) for the ear phones
19	Display
20	[SET] Enter button for menu control

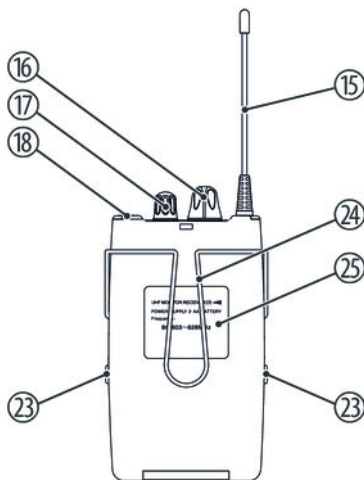
21, 22	<i>[+] / [-]</i> Buttons for increasing / decreasing the currently indicated value.
23	Battery compartment closures for two AA cells (LR6), 1.5 V or comparable rechargeable batteries.

Top panel of the receiver



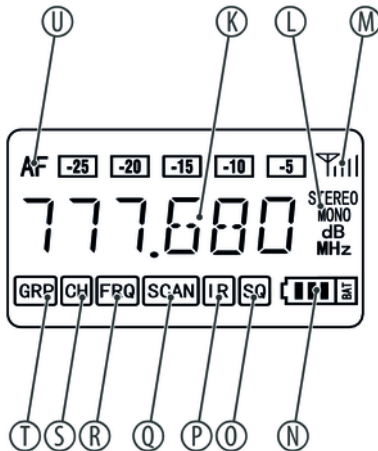
15	Flexible antenna.
16	<i>[OFF/ON/VOL]</i> Main switch and volume control. Turn this control clockwise past the point of resistance to turn on the receiver. Turn it further to increase the volume. Turn this control counter-clockwise to reduce the volume. Turn it further past the point of resistance to turn off the receiver.
17	<i>[L/R]</i> Pan control.
18	3.5 mm phone socket (stereo) for the ear phones.
24	Clip for fastening the transmitter to the guitar strap or to the body, for example on the belt.

Rear panel of the receiver



15	Flexible antenna
16	[OFF/ON/VOL] Main switch and volume control. Turn this control clockwise past the point of resistance to turn on the receiver. Turn it further to increase the volume. Turn this control counter-clockwise to reduce the volume. Turn it further past the point of resistance to turn off the receiver.
17	[L/R] Pan control
18	3.5 mm phone socket (stereo) for the ear phones
23	Battery compartment closures for two AA cells (LR6), 1.5 V or comparable rechargeable batteries
24	Clip for fastening the transmitter to the guitar strap or to the body, for example on the belt
25	Indication of the frequency range in which the device operates. The specification here must match the specification printed on the back of the transmitter.

Display of the receiver



K	Indicates the frequency that is assigned to the set combination of frequency group and channel.
L	[STEREO] / [MONO] Indicates the set operating mode (stereo or mono).
M	Radio signal strength indicator (one to four bars).
N	Battery level indicator. Replace the batteries when only one bar remains displayed.
O	[SQ] Flashes if the squelch is being adjusted.
P	[IR] Flashes if the infra-red interface is being adjusted.
Q	[SCAN] Flashes if the frequency is being adjusted.
R	[FRQ] Flashes if the frequency is being adjusted.

S	<i>[CH]</i> Flashes if the channel is being adjusted.
T	<i>[GRP]</i> Flashes if the frequency group is being adjusted.
U	<i>[AF]</i> Indicates the incoming audio signal level.

6 Operating

6.1 Setting up the transmitter

Selecting frequency group and channel

Press *[SET]* to open the menu. Use button *[+]* and *[-]*, and choose 'GRP:01'. The field 'GRP:01' in the bottom line of the display flashes. Confirm with *[SET]*. Use the keys *[+]* and *[-]* to select the required group and press *[SET]* to confirm. Press *[SET]* again to confirm the setting and to set the channel.

The field 'CH' in the bottom line of the display flashes. Confirm with *[SET]*. Use the keys *[+]* and *[-]* to select the required channel and press *[SET]* to confirm.

Use the *[+]* or *[-]* keys to increase or reduce the displayed value. When the desired value is shown press *[SET]* to confirm the setting and exit the menu.

The display shows the used transmission frequency in MHz that is assigned to the set combination of frequency group and channel.



Transmitter and receiver must be set to the same combination of frequency group and channel. If you use multiple wireless systems from this device family, for best results you should assign all systems to the same frequency group, but give each system a different channel.

To set the frequency directly

Alternatively to selecting the frequency group and channel, you can also set the transmitter frequency directly.

To set the frequency directly, press *[SET]* to open the menu. Use the *[+]* and *[-]* keys and select 'FRQ'. The field 'FRQ' in the bottom line of the display flashes. Confirm with *[SET]*. The first three numbers in the frequency display flash. Use the *[+]* or *[-]* keys to increase or reduce the displayed value. When the desired value is displayed, press *[SET]*. The last three numbers in the frequency display flash. Use the *[+]* or *[-]* keys to increase or reduce the displayed value. When the desired value is shown press *[SET]* to confirm the setting and exit the menu.

The display shows the transmitter frequency set in MHz.

Synchronising the frequency with the receiver

To synchronise the frequency via the infra-red interface with the receiver, open the battery compartment cover on the receiver and place the *[IR]* symbol on the receiver near the *[IR]* symbol on the transmitter.

Press *[SET]* to open the menu. Use the *[+]* and *[-]* keys and select '*IR*'. The field '*IR*' in the bottom line of the display flashes. Confirm with *[SET]*. The display shows '*IR - - - -*'. The frequency set on the transmitter is transferred to the receiver. This process can take up to ten seconds. After synchronising the frequency, the menu closes automatically.

The displays on the transmitter and receiver show the same transmission frequency in MHz.

Selecting the operating mode

Press *[SET]* to open the menu. Use the *[+]* and *[-]* keys and select '*MODE*'. The field '*MODE*' flashes in the display. Confirm with *[SET]*. Use the *[+]* and *[-]* keys to switch between mono and stereo mode. When the desired mode is shown press *[SET]* to confirm the setting and exit the menu.

Selecting the transmitter power

Press *[SET]* to open the menu. Use the *[+]* and *[-]* keys and select '*RF*'. The field '*RF*' flashes in the display. Confirm with *[SET]*. Use the *[+]* and *[-]* keys to select the required transmitter power '*10mW*' or '*50mW*'. When the desired value is shown press *[SET]* to confirm the setting and exit the menu.

6.2 Setting up the receiver

Selecting frequency group and channel

Press *[SET]* to open the menu. Use the ▲ and ▼ keys and select 'GRP'. The field 'GRP' in the bottom line of the display flashes. Confirm with *[SET]*. The set group flashes in the display. Use the ▲ and ▼ keys to select the required group and press *[SET]* to confirm the setting and to move on to the channel setting.

The field 'CH' in the bottom line of the display flashes. Confirm with *[SET]*. Use the ▲ and ▼ keys to select the required channel and press *[SET]* to confirm.

The display shows the used transmission frequency in MHz that is assigned to the set combination of frequency group and channel.



Transmitter and receiver must be set to the same combination of frequency group and channel. If you use multiple wireless systems from this device family, for best results you should assign all systems to the same frequency group, but give each system a different channel.

To set the frequency directly

Alternatively to selecting the frequency group and channel, you can also set the transmitter frequency directly.

To set the frequency directly, press *[SET]* to open the menu. Use the ▲ and ▼ keys and select 'FRQ'. The field 'FRG' in the bottom line of the display flashes. Confirm with *[SET]*. The first three numbers in the frequency display flash. Use the ▲ and ▼ keys to increase or decrease the indicated value. When the desired value is displayed, press *[SET]*. The last three numbers in the frequency display flash. Use the ▲ and ▼ keys to increase or decrease the indicated value. When the desired value is shown press *[SET]* to confirm the setting and exit the menu.

The display shows the transmitter frequency set in MHz.

Automatic frequency search

To start an automatic frequency search, press *[SET]* to open the menu. Use the ▲ and ▼ keys and select 'SCAN'. The field 'SCAN' in the bottom line of the display flashes. Confirm with *[SET]*. The display shows 'SC' and the search begins. The lines next to 'SC' flash. The device's complete frequency range is scanned in 25 KHZ increments. Once the search is complete, the value is shown in the display. Press *[SET]* to confirm the setting and exit the menu.

The display shows the transmitter frequency set in MHz.

Selecting the operating mode

Press *[SET]* to open the menu. Use the ▲ and ▼ keys and select 'STEREO' on the right-hand side of the display. Use the ▲ and ▼ keys to switch between mono and stereo mode. When the desired mode is shown press *[SET]* to confirm the setting and exit the menu.

Switching on squelch

Press *[SET]* to open the menu. Use the ▲ and ▼ keys and select 'SQ'. The field 'SQ' in the bottom line of the display flashes. Confirm with *[SET]*. The display shows 'SQ -- 95' or another preset value. The 'dB' field on the right-hand side of the display lights up and the value '- 95' or another preset value flashes.

7 Technical specifications

7.1 Transmitter

Input	2 × XLR socket (symmetrical)
Headphone output	3.5 mm and 6.35 mm phone sockets (stereo)
Modulation type	Frequency modulation (FM)
Frequency range	the t.bone IEM 150 640 MHz (item No. 439536): 640 MHz...665 MHz
	the t.bone IEM 150 823 MHz (item No. 439537): 823 MHz...832 MHz
	the t.bone IEM 150 863 MHz (item No. 439539): 863 MHz...865 MHz
Transmitter level	10 dBm
Transmission power	10 mW...50 mW
Input impedance	20 kΩ
Input level	-10 dBV...10 dBV

Technical specifications

Gain range	0 dB...3 dB
NF frequency response	20 Hz...20 kHz (± 3 dB)
THD	< 0.3 %
Dynamic range	> 100 dB
Channel separation	35 dB
Signal-to-noise ratio	> 80 dB (A-weighted)
Image frequency rejection	80 dB
Voltage supply	Power adapter 15 V ~ / 500 mA
Dimensions (W \times H \times D, without antenna)	210 mm \times 190 mm \times 49 mm
Weight	1.0 kg

7.2 Receiver

Earphones output	3.5 mm mini phone socket (stereo)
Modulation type	Frequency modulation (FM)
Frequency range	the t.bone IEM 150 R 640 MHz (item No. 439541): 640 MHz...665 MHz
	the t.bone IEM 150 R 823 MHz (item No. 439542): 823 MHz...832 MHz
	the t.bone IEM 150 R 863 MHz (item No. 439543): 863 MHz...865 MHz
Image frequency rejection	> 50 dB
Sensitivity	114 dB/mW
Audio output level	60 mW
Operating supply voltage	2 AA cells (LR6, 1.5 V)
Dimensions (W × H × D, without antenna)	65 mm × 110 mm × 22 mm
Weight (without batteries)	150 g

8 Plug and connection assignment

Introduction

This chapter will help you select the right cables and plugs to connect your valuable equipment in such a way that a perfect sound experience is ensured.

Please note these advices, because especially in 'Sound & Light' caution is indicated: Even if a plug fits into the socket, an incorrect connection may result in a destroyed power amp, a short circuit or 'just' in poor transmission quality!

Balanced and unbalanced transmission

Unbalanced transmission is mainly used in semi-professional environment and in hifi use. Instrument cables with two conductors (one core plus shielding) are typical representatives of the unbalanced transmission. One conductor is ground and shielding while the signal is transmitted through the core.

Unbalanced transmission is susceptible to electromagnetic interference, especially at low levels, such as microphone signals and when using long cables.

In a professional environment, therefore, the balanced transmission is preferred, because this enables an undisturbed transmission of signals over long distances. In addition to the conductors 'Ground' and 'Signal', in a balanced transmission a second core is added. This also transfers the signal, but phase-shifted by 180°.

Since the interference affects both cores equally, by subtracting the phase-shifted signals, the interfering signal is completely neutralized. The result is a pure signal without any noise interference.

1/4" TS phone plug (mono, unbalanced)



1	Signal
2	Ground, shielding

1/4" TRS phone plug (mono, balanced)



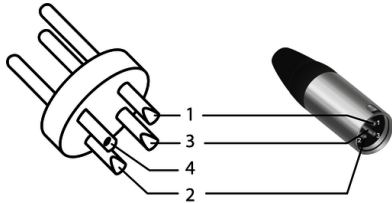
1	Signal (in phase, +)
2	Signal (out of phase, -)
3	Ground

Three-pole 1/8" mini phone jack (stereo, unbalanced)



1	Signal (left)
2	Signal (right)
3	Ground, shielding

XLR plug (balanced)



1	Ground, shielding
2	Signal (in phase, +)
3	Signal (out of phase, -)
4	Shielding on plug housing (option)

9 Troubleshooting

In the following we list a few common problems that may occur during operation. We give you some suggestions for easy troubleshooting:

Symptom	Remedy
No sound	<ol style="list-style-type: none"><li data-bbox="632 244 1533 288">1. Check the power supply of transmitter and receiver.<li data-bbox="632 291 1533 395">2. Ensure that the transmitter and receiver are operating in the same frequency range and that the transmitter antenna is designed for this frequency range. The frequency range can be found on the devices.<li data-bbox="632 397 1533 473">3. Are the transmitter and receiver set to the same frequency group and channel?<li data-bbox="632 476 1533 602">4. Test the connection between the transmitter and the connected audio device (amplifier, mixer). Is the connected audio device turned on and does the signal level at the output of the audio device match to the input requirements of the transmitter?<li data-bbox="632 604 1533 680">5. See if the sound transmission works when you move the receiver closer to the transmitter.
Transmission is interrupted	<ol style="list-style-type: none"><li data-bbox="632 697 1533 762">1. Make sure that no metal objects near the transmitter or receiver obstruct the transmission.<li data-bbox="632 764 1533 809">2. Modify the orientation of the antennas.

Symptom	Remedy
	2. If you use more than one wireless system at the same time, check the used frequency groups and channels.
	3. Interference can also be caused by televisions, radios or mobile phones.
The sound is distorted.	Change the <i>[VOLUME]</i> control settings on the transmitter.

If the procedures recommended above do not succeed, please contact our Service Center. You can find the contact information at www.thomann.de.

10 Protecting the environment

Disposal of the packaging material



For the transport and protective packaging, environmentally friendly materials have been chosen that can be supplied to normal recycling.

Ensure that plastic bags, packaging, etc. are properly disposed of.

Do not just dispose these materials with your normal household waste, but make sure that they are fed to a recovery. Please follow the notes and markings on the packaging.

Disposal of batteries



Batteries must not be disposed of as domestic waste or thrown into fire. Dispose of the batteries according to national or local regulations regarding hazardous waste. To protect the environment, dispose of empty batteries at your retail store or at appropriate collection sites.

Disposal of your old device



This product is subject to the European Waste Electrical and Electronic Equipment Directive (WEEE) in its currently valid version. Do not dispose with your normal household waste.

Dispose this device through an approved waste disposal firm or through your local waste facility. When discarding the device, comply with the rules and regulations that apply in your country. If in doubt, consult your local waste disposal facility.



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