

# TRANTEC SYSTEMS

## S5000 IEM

PROFESSIONAL UHF STEREO IN-EAR-MONITOR SYSTEM

## OPERATING INSTRUCTIONS



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## **Introduction:**

Thank you for purchasing your *TRANTEC S5000 IEM* In-Ear Monitor system. This is a high quality stereo UHF IEM system offering highly flexible configuration using the latest patented digital techniques. Not only can the operating frequency of the system be changed at will, but the equalisation can also be tailored to suit particular earpieces or users. The S5000 IEM provides an easy to use interface for hassle-free set up. It can also be programmed if required from a PC, providing total flexibility to suit any situation.

In-Ear Monitoring has become increasingly popular lately, providing performers the opportunity to have their monitor mix fed to them personally and at the same time doing away with the requirements for bulky foldback monitors, amplifier racks etc. Besides from its obvious applications in the field of live sound, IEM is equally at home with conference work, theatre cueing, broadcast and anywhere where a user needs a high quality stereo audio feed without the constraints of cables or loudspeakers. The possibilities are almost endless...

## **General IEM Operating Guidelines:**

Always try to locate the transmitter as close as possible to the area in which the receiver(s) will be used, as this minimises the chance of there being any drop out. Always try to ensure a line of sight path between the transmitter and receiver(s) – obstacles such as walls can significantly reduce the radio signal strength. Any number of receivers can be used with a transmitter, all receiving the same stereo mix. If more than one mix is required, then each must be transmitted on a different frequency using a different transmitter. The receivers can then be set to receive on the desired frequency.

The system comes pre-programmed with a set of intermodulation free frequencies (see later section on choice of frequency). If radio microphones are to be used at the same location, then their frequencies must also be taken into account when selecting the frequencies for the IEM transmitters. Intermodulation is a natural radio wave interference phenomenon resulting from the use of nearby radio frequencies simultaneously. It can be avoided by careful choice of frequencies – the set of frequencies programmed by default into the S5000 IEM has been carefully calculated to avoid intermodulation. A license must be obtained for use of the IEM system within the UK (see section on licensing). If you have any questions regarding the selection of appropriate operating frequencies then do not hesitate to contact Trantec Systems.

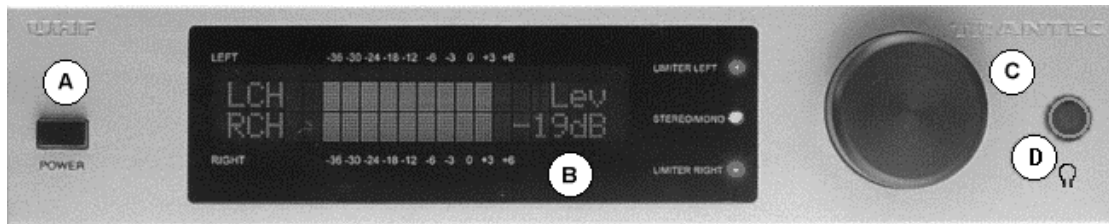
It is wise to avoid placing either the IEM transmitter or receiver(s) near computer or mobile telephone equipment, as these can create unwanted radio interference. Also do not place multiple IEM transmitters too close together, as the outputs from the antennae may interfere – avoid racking IEM transmitters together when using the standard rear mount antennas.

## **Warning:**

The use of any IEM system and its associated earpieces or headphones at elevated listening levels or for extended periods of time can result in permanent hearing damage. This is particularly the case when the limiters are switched off. Trantec Systems cannot be held responsible for any damage of this type arising through the misuse of the S5000 IEM system.

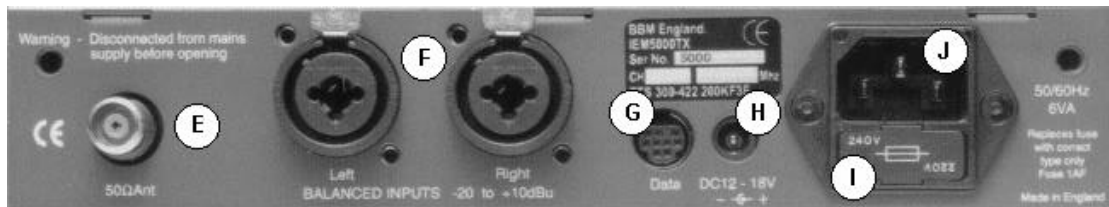
## The Transmitter:

**Diagram 1 – S5000 IEM Transmitter Front View:**



- A: Power Switch
- B: LCD Panel
- C: Data Wheel
- D: Headphone Output

**Diagram 2 – S5000 IEM Transmitter Rear View:**



- E: Antenna Connector
- F: Stereo Inputs (¼" Jack or XLR, Combination Sockets)
- G: Data Connector (for Programming from a PC)
- H: DC Input Socket (12V – 18V)
- I: Fuse Holder / Mains Voltage Selector
- J: IEC Fused Mains Inlet Socket

### **Initial Setting Up:**

If using a mains supply, ensure that the fuse holder (I) is turned so that the correct mains voltage is displayed at the top. Connect the mains supply to the IEC inlet (J). For certain situations a DC supply may be more suitable than a mains supply – in this case use the DC input socket (H), following the polarity diagram marked below it (centre positive, outside negative). Never use a DC supply and a mains supply simultaneously.

Connect the antenna to the antenna socket (E). Use either the supplied antenna or any other exterior 50 Ohm antenna of your choice, provided it is for the correct UHF channel.

Connect the audio signal(s) to the ¼" Jack or XLR combination sockets (F). These will accept either a balanced XLR, balanced jack or unbalanced jack connector. If the source is mono, use only the left channel, otherwise use both. The transmitter can be configured to accept an input level can be between –20 and +10dBu.

Turn on the power using the power switch (A). All further configuration is done using the data wheel (C) in conjunction with menus shown on the LCD panel (B), as described in the following sections. The output can be monitored via the headphone output (D).

### ***Using The Data Wheel and Menus:***

When the transmitter is first powered up, it will initially display a welcome message and will then show the default screen giving the transmitting frequency along with VU bars for the left and right channels. Depending on the unit's configuration, the default screen may also display either the graphic equalisation preset name or the user's name. All configuration is done using the data wheel and the menu structure.

In order to activate the menus the data wheel must be pressed. This will then show a menu as follows:

1. *Input Level*
2. *Headphone Gain*
3. *Stereo/Mono*
4. *Frequency Select*
5. *Graphic Preset*
6. *Name Options*
7. *Setup Info*
8. *Return*

Turning the data wheel moves through the menu items. The current menu item is shown on the top line of the display and is marked with a small arrow on the right hand side. Selecting option 8 *Return* will clear the menu and return you to the default screen. The function of the other menu items is described in the following sections.

Turning the data wheel whilst in the default screen has no effect – this is a safety feature to prevent accidental alterations, it must be pressed first to activate the menus.

### ***Changing The Input Level:***

Select option 1 *Input Level* from the menu. This will show enlarged VU meters and the input sensitivity (in dB) in the bottom right hand corner. The input sensitivity can now be adjusted by turning the data wheel between  $-19\text{dB}$  and  $+10\text{dB}$ . The given sensitivity relates to the input level required to optimally drive the transmitter, so if for example the input level driving the transmitter is fixed at  $0\text{dB}$ , then setting the sensitivity to  $-19\text{dB}$  will give a louder signal at the receiver and setting it to  $+10\text{dB}$  will give a quieter signal. The transmitter is fitted with audio limiters, the operation of which is shown by the front panel LEDs. The input sensitivity should be adjusted so that the limiter LEDs only light up for peaks in the audio signal. It is possible to switch off the limiters – see later. It is recommended that the limiters are switched off only when an external limiter is used before the transmitter.

The transmitter can be left with this screen showing – this will then provide large VU readouts and allow immediate variation of the input sensitivity by turning the data wheel. Pressing the data wheel will return you to the menu. From here you can then select option 8 *Return* to return to the default screen.

### ***Adjusting The Headphone Monitor Level:***

Select option 2 *Headphone Gain* from the menu. The gain for the headphone output is shown in dB, between  $-19\text{dB}$  and  $+10\text{dB}$ . Adjust this as required for comfortable listening. When the headphone level is as desired, press the data wheel to return to the menu. Selecting option 8 *Return* will clear the menu and return you to the default screen. The headphone output allows the effect of the graphic equaliser and the limiters to be monitored, but it will always be in stereo, even if mono transmission is selected.

### **Selecting Stereo Or Mono Operation:**

Select option 3 *Stereo/Mono* from the menu. You can then choose from Stereo or Mono operation by turning the data wheel. Your choice is shown on the top line marked with a small arrow on the right hand side. The current setting is also indicated. Pressing the data wheel will confirm your new setting and return you to the default screen. If stereo operation is selected, the front panel STEREO/MONO LED will be illuminated.

### **Selecting The Transmitting Frequency:**

Select option 4 *Frequency Select* from the menu. You can then scroll through the available frequencies by turning the data wheel. Each frequency is shown with the corresponding selection switch and bank settings for a receiver (assuming the transmitter and receiver have not been programmed with different frequency sets). Turn the data wheel until your chosen frequency is shown on the top line, marked with a small arrow on the right hand side. Pressing the data wheel will select this frequency as the transmitting frequency and return you to the default screen.

### **Selecting The Graphic Equaliser Preset:**

Select option 5 *Graphic Preset* from the menu. You can then scroll through the 5 graphic equalisation presets. The current preset is the one shown on the top line, marked with a small arrow on the right hand side. As you scroll through the presets, the change is immediate and can be monitored via a receiver. Pressing the data wheel will return you to the default screen.

The presets and their names can be altered by a PC connected via the rear panel data connector (G). At least one of the presets should always be set flat, allowing the equalisation to be bypassed if not required. The exact choice of presets will depend on what has been programmed from the PC, but units are shipped with a default set of standard equalisation curves.

### **Configuring The Name Options:**

Selecting option 6 *Name Options* from the main menu will open a sub menu as follows:

1. *Display Name?*
2. *Alter Name?*
3. *Display Preset?*

Choosing option 1 *Display Name?* will allow you to toggle between whether or not the user name is displayed in the default screen, using the data wheel. The current setting is indicated. Pressing the data wheel will confirm your choice and return you to the default screen with the user name shown or not as selected.

Choosing option 2 *Alter Name?* will display the user name with a cursor under the first character. Use the data wheel to change this character and click it to move on to the next character. There can be up to 8 characters in the user name, chosen from upper and lower case letters, numbers, blank spaces and some symbols. When all 8 characters have been set (i.e. when the data wheel is clicked as the cursor is under the 8<sup>th</sup> character, the screen will return to the default screen. Changing the user name will not automatically cause it to be shown in the default screen. If this option has not been configured, then it must be set as described in the previous paragraph.

The user name can be useful in multiple installations. Typically it would be set to reflect the person or persons using receivers on the chosen transmitting frequency or it would be used to indicate the mix being sent on that frequency.

Choosing option 3 *Display Preset?* Will allow you to toggle between whether or not the graphic equaliser preset name is displayed in the default screen, using the data wheel. The current setting is indicated. Pressing the data wheel will confirm your choice and return you to the default screen with the preset name shown or not as selected.

It is not possible to display the preset name and the user name simultaneously. Choosing to show the preset name will cancel the display of the user name and vice versa.

### ***Other Setup Information:***

Selecting option 7 *Setup Info* from the main menu will open a sub menu as follows:

1. *Software Version*
2. *LCD Contrast*
3. *Data Scroll*
4. *Limiter Switch*

Choosing option 1 *Software Version* will show the version of firmware loaded in the transmitter and the program name. The program name relates to the set-up data regarding the choice of frequencies etc. programmed into the transmitter. Pressing the data wheel will return you to the main menu.

Choosing option 2 *LCD Contrast* will allow you to vary the LCD contrast using the data wheel. Pressing the data wheel will return you to the main menu.

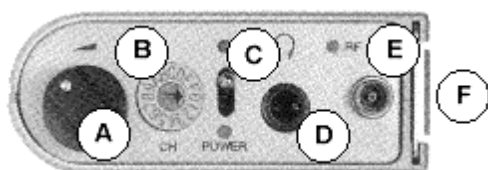
Choosing option 3 *Data Scroll* will initiate a scrolling message. By default this will contain information regarding contacting Trantec Systems, but the contents of the scrolling message may have been adjusted by your dealer. Pressing the data wheel at any stage during the scrolling message will return you to the main menu.

Choosing option 4 *Limiter Switch* will initially bring up a warning message, after which it will be possible to select between Limiter On and Limiter Off using the data wheel. The current setting is indicated. Pressing the data wheel will confirm your choice and return you to the default screen. It is recommended that the limiter is never switched off unless an alternative external limiter is used, as otherwise potentially damaging high signal levels may be transmitted.

The warning message relates to the effect of switching the limiters off. This will not only permit high audio levels to be transmitted, but it will also increase the transmission bandwidth and therefore the likelihood of intermodulation in multi-user systems. For this reason, it is recommended that the limiters are always left switched on in multi-user systems.

## The Receiver:

**Diagram 2 – S5000 IEM Receiver Top View:**



- A: Volume Control
- B: Rotary Selection Switch
- C: Power Switch
- D: 3.5mm Stereo Output Jack
- E: Antenna Connector
- F: Sliding Side Panel & Mode Switch

### **General Setting Up & Operation:**

Screw the external antenna into the antenna connector on the top (E). The unit is powered by a single PP3 (MN1604) alkaline 9V battery. To access this, slide the side panel (F) up using the finger grip at the top. Insert the battery into the slot terminals first, with the positive terminal at the top. To secure the battery slide the side panel back down – it may be necessary to apply slight pressure to the battery to allow the side panel to be shut. This is intentional as this tight fit will ensure the battery does not move during use. The unit is protected against reverse battery insertion.

Connect your earpieces or headphones to the 3.5mm stereo jack (D) on the top of the unit. Before turning on, it is advisable to turn the volume control (A) to minimum (fully anticlockwise) to avoid experiencing uncomfortable and unexpected sound levels.

Turn the unit on with the power switch (C). The front panel LCD will first show briefly show a power up ID and will then provide an indication of the remaining battery life before switching to show information according to the current operating mode (normally the receiving frequency). If the battery indication reads LOW then the battery should be changed immediately. When the unit is switched on, the red LED adjacent to the power switch (C) will illuminate. If this LED flashes then the battery is low and should be replaced. If a transmitter is working on the current frequency, the green RF LED will illuminate and the receiver will immediately receive the signal. Otherwise, it will remain muted until an RF signal is present. Adjust the volume control (A) until a comfortable level has been reached.

***WARNING:** In order to achieve optimum performance with a wide variety of earpieces and headphones, the receiver may be capable of generating very high levels through certain types of transducer. Listening at a high level may cause permanent loss of hearing.*

### **Configuring the Receiver Using the Rotary Selection Switch & Mode Switch:**

The mode switch is located under the side panel (F). The receiver has four operating modes which can be selected by pressing this switch. When this switch is pressed, the new mode will be shown briefly on the display. The receiver will remain in the mode it was last placed in, this will be indicated briefly on power up. Different changes can be made within each mode using the rotary selection switch (B).

Note that when in frequency or bank change mode, the stereo image is fixed as normal, and when in one of the two pan modes, the receiving frequency is fixed as set before that mode was selected.

The four modes are described in detail on the next page.

### **Frequency Change Mode (FrEq):**

This is the standard operating mode. The display indicates the receiving frequency, with the current bank shown below. The rotary selection switch (B) will adjust the receiving frequency. Any changes are not immediate – when a new frequency is chosen, a small marker appears in the bottom left hand corner of the display indicating that the new frequency is not yet active. To activate the new frequency the receiver must be turned off and back on again. This is a safety feature to prevent accidental frequency changes. There are 16 frequencies available in each of the 4 banks, giving a total of 64 frequencies. In this mode, the receiver gives normal stereo operation. The receiver should be left in this mode if standard operation is required.

### **Bank Change Mode (bAnc):**

This mode is very similar to the frequency change mode, except that turning the rotary selection switch will change the bank. The frequency shown when this is done will be the first frequency in the new bank. As with the frequency change mode, any change will not be activated until the receiver is turned off and back on. After changing bank, it will normally be necessary to return to the frequency changing mode to select the desired frequency from the new bank. The exact selection of frequencies available will depend on how the receiver has been programmed. If special frequencies are required, the unit can be reprogrammed from a PC via the data connector located near the mode switch.

### **Stereo Pan Mode (St PAN):**

In this mode, the stereo image sent to the earpiece or headphones can be adjusted using the rotary selection switch. To use this mode, the transmitter should be set to stereo operation with a stereo source. The display shows **L** and **r** with a corresponding number between **-7** and **7**. **L** and **r** represent the left and right earpiece channel, whilst the numbers indicate the stereo image being supplied to each channel with **-7** representing just the left channel, **7** representing just the right channel and **0** representing a mono mix of both channels. This mode will be useful for adjusting the stereo image for users located in different locations – for example a conductor may want a reversed stereo image as he will be facing towards the performers and thus a normal stereo image would be the opposite to that provided through the PA. It is best to listen when changing the image to ensure it is as desired, some examples are given below:

<b>L -7 r 7</b>	Normal Stereo Image
<b>L 0 r 0</b>	Mono
<b>L 7 r -7</b>	Reversed Stereo Image

### **2 Channel Pan Mode (2CHPAN):**

In this mode, the output to the earpiece or headphones is mono and can be mixed as required from the two received channels using the rotary selection switch. To use this mode, the transmitter should be set to stereo operation with two discrete sources (A and B). For example, channel A could be producer talkback and channel B could be the main output when the system is used in a live production environment. The display shows **A** and **b** with corresponding numbers between **7** and **-7**. **7** represents full amplitude for that channel and **-7** represents maximum attenuation – note that even with maximum attenuation, a channel will still be present at a very low level – neither channel can ever be totally removed from the mix due to the limited channel separation available within the receiver. As with stereo pan mode, it is best to listen when adjusting the mix to ensure it is as desired, some examples are given below:

<b>A 7 b -7</b>	Channel A (Channel B has maximum attenuation)
<b>A 0 b 0</b>	Equal Mix of Channel A and Channel B
<b>A -7 b 7</b>	Channel B (Channel A has maximum attenuation)

## Choice of Operating Frequency:

As supplied, the IEM system is programmed with frequencies comprising of an intermodulation free set of 14 (9 in channel 69) with an additional 3 frequencies available to create a set of 17 if required. This set makes use of frequencies in channels 67 and 68, the use of which is permitted on an individual license basis in various geographical locations as detailed in the next section. These frequencies can be used for IEM systems or S5000 radio microphone systems, mixed together as required. The frequency sets are as follows:

### **Set of 14 IEM / Mic Frequencies:**

842.325 MHz (Ch 67)  
843.525 MHz (Ch 67)  
844.450 MHz (Ch 67)

846.025 MHz (Ch 68)  
848.475 MHz (Ch 68)

854.900 MHz (Ch 69)  
855.275 MHz (Ch 69)  
855.900 MHz (Ch 69)  
856.575 MHz (Ch 69)  
858.200 MHz (Ch 69)  
858.650 MHz (Ch 69)  
860.400 MHz (Ch 69)  
860.900 MHz (Ch 69)  
861.750 MHz (Ch 69)

### **Set of 17 IEM / Mic Frequencies:**

842.325 MHz (Ch 67)  
842.750 MHz (Ch 67)\*  
843.525 MHz (Ch 67)  
844.450 MHz (Ch 67)

846.025 MHz (Ch 68)  
848.475 MHz (Ch 68)  
849.500 MHz (Ch 68)\*  
853.375 MHz (Ch 68)\*

854.900 MHz (Ch 69)  
855.275 MHz (Ch 69)  
855.900 MHz (Ch 69)  
856.575 MHz (Ch 69)  
858.200 MHz (Ch 69)  
858.650 MHz (Ch 69)  
860.400 MHz (Ch 69)  
860.900 MHz (Ch 69)  
861.750 MHz (Ch 69)

By default the set of 14 frequencies is stored in banks 1 and 4 and the set of 17 frequencies is stored in banks 2 and 3. If you are using a single IEM system, use one of the channel 69 frequencies. For up to 9 systems (any combination of IEM's and Microphones) use the channel 69 frequencies. For up to 14 systems (any combination) use the set of 14 optimised frequencies. If more systems are required, use the set of 17. This set is built from the set of 14, with 3 additional frequencies (marked \*). These additional frequencies are not as safe as the other 14 in terms of intermodulation potential and should thus only be chosen after the other 14 have been used.

If UHF radio microphones are to be used at the same time as the IEM systems, then 3 additional radio microphone only frequencies can be accommodated in channel 69 along with the 9 IEM or microphone frequencies listed above as follows:

### **Radio Microphone Only Frequencies for use with Above Frequency Sets in Channel 69:**

856.175 MHz  
861.200 MHz  
861.550 MHz

Obviously if less IEM systems are being used in channel 69, then more radio microphones can be accommodated.

## Frequency Licensing:

Licenses must be obtained for operation in channel 69, channel 68 and channel 67. These are available from JFMG limited:

JFMG Limited  
72 Upper Ground  
London  
SE1 9LT

Phone: +44 (0) 171 261 3797

Fax: +44 (0) 171 737 8499

E-Mail: [JFMG@compuserve.com](mailto:JFMG@compuserve.com)

Use of channels 67 and 68 is only permitted indoors within certain geographical areas and the exact location must be supplied. This is summarised for major towns and cities below:

<b>Location:</b>	<b>Channel 67:</b>	<b>Channel 68:</b>
<i>Belfast</i>	Yes	Yes
<i>Birmingham</i>	Yes	Yes *
<i>Brighton</i>	Yes *	Yes *
<i>Bristol</i>	Yes	Yes
<i>Cambridge</i>	Yes	Yes
<i>Cardiff</i>	No	Yes
<i>Coventry</i>	Yes	Yes
<i>Edinburgh</i>	Yes	No
<i>Glasgow</i>	Yes	Yes *
<i>Leeds</i>	Yes	Yes
<i>Leicester</i>	Yes	Yes
<i>Liverpool</i>	Yes	Yes *
<i>London (Central)</i>	Yes *	Yes *
<i>Manchester</i>	Yes *	No
<i>Newcastle</i>	Yes *	No
<i>Norwich</i>	No	Yes
<i>Oxford</i>	No	No
<i>Plymouth</i>	No	Yes *
<i>Portsmouth</i>	No	Yes *
<i>Sheffield</i>	No	Yes *
<i>Southampton</i>	No	Yes
<i>Swansea</i>	Yes *	Yes

\* Certain restrictions apply – check with JFMG

## Technical Summary:

### ***Transmitter Details:***

- Up to 64 frequencies, in up to 4 banks (16 per bank)
- Available configured on any UHF channel between 60 and 70, with a 32MHz bandwidth
- Up to 5 preset equalisations for optimisation with different earpieces
- Internal Stereo switchable AF limiters with fast attack and visual indicators
- Mono/Stereo transmission is front panel selectable
- 1U 19" half width rack format, all metal construction
- Headphone Output for monitoring
- Stereo Line Input (-20dB to +10dB adjustable, balanced on XLRs or unbalanced on jacks)
- Fully microprocessor controlled with easy to use front panel data wheel
- Large front panel LCD can show stereo VU meters, RF frequency or user name
- User name can be set from the front panel
- Internal Mains Power Supply, can also be powered from 12v supply for field use
- Windows software available to program frequency allocation, equalisation and user name from a PC or laptop. (Requires a Trantec adapter lead to connect to parallel port)

### ***Receiver Details:***

- Frequency, channel and bank configuration same as for transmitter
- Large easy access volume control knob
- Separate power switch, recessed to prevent accidental operation
- Dual conversion receiver topology with high dynamic range front end for optimum image and interference rejection
- RF bandwidth < 180kHz - will work on standard radio mic channels
- Output on standard stereo mini jack for connection of earpiece or headphones (4Ω-32Ω)
- Fully microprocessor controlled
- Top panel LEDs indicate RF mute and power/battery low
- Reverse Battery Protection
- Unique soft mute system
- Stereo & 2 Channel (Mono) Pan Modes
- Frequency selected by top panel rotary selector with concealed bank change push button
- LCD indicates frequency and bank, with battery life indication on power up
- Compact beltpack case, all metal construction. Same format as S5000TX beltpack
- Powered by single MN1604/PP3 9v battery, average life 8 hours
- Windows software available to program frequency allocation from a PC or laptop. (Requires a Trantec adapter lead to connect to parallel port)

### ***System Specifications:***

Frequency Response: 40Hz to 15kHz  
Stereo Separation: 40dB (typical)  
Signal to Noise Ratio: 80dB (minimum)  
Typical Range: Up to 100m, line of sight

## Spares And Accessories:

S5000IEM-RX	Receiver with Antenna (Excluding Earpieces)
S5000IEM-TX	Transmitter with Antenna
S5000EP	Pair of Earpieces
S5000RK	Racking Kit for Two S5000IEM-TX Transmitters
S5000RK-1	Racking Kit for One S5000IEM-TX Transmitter
S5000RKD	Single Width Rack Draw for Four S5000IEM-RX Receivers
S5000TA	Receiver Antenna
S5000RA	Transmitter Antenna
S5000BP	Body Pouch (Black) for S5000IEM-RX Receiver
S5000FP	Body Pouch (Pink) for S5000IEM-RX Receiver
S5000SCTX	Beltclip for S5000IEM-RX Receiver

## Guarantee:

All Trantec products are guaranteed for a period of one year from date of purchase against defects in materials and workmanship. In the event of a claim under guarantee the system should be returned to your dealer in its original packaging and with proof of purchase. Defects caused by modification, misuse or accident are not covered by this guarantee.

Due to our continual policy of research and development we reserve the right to alter specifications without prior notice.

## Contact Information:

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