

# Aladdin

Digital Infrared Language Distribution



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Installation and User Manual

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**History**

<b>Date</b>	<b>Version</b>	<b>Changes</b>	<b>Editor</b>
13/02/09	V1.01	First edition of the manual	EV
21/08/09	V1.02	<b>Changes:</b> <b>Chapter 5 Assembly Instructions for the Battery Pack of the Receiver</b> <b>Change earphone to headphone</b> <b>Added ventilation plate in the transmitter installation</b> <b>Added extra information about the master slave combination if using 2 transmitters</b> <b>Checking section references</b>	EV
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01/09/2011	V1.07	TCS2500 ↔ Confidea	EVC

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- All rights reserved for translation, reprint or reproduction
- Contents may change without prior announcement
- All technical specifications are guideline data and no guaranteed features
- We are not responsible for any damage caused by improper use of this manual
- The equipment must be connected to earth!
- This product is conform to the rules of the following European directive 2004/108/EC.
- To protect your hearing avoid high pressure level on headphones. Adjust to a lower and convenient level.
- If any detailed information needed, please contact your local TELEVIC representative.
- TELEVIC is the registered trademark of TELEVIC N.V.



## Important Safety Instructions

1. Please read the safety instructions carefully before installing and using the equipment.
2. Please keep this safety instruction for future reference.
3. Please strictly adhere to the WARNINGS in the user's guide.
4. Please follow all the operation instructions in the user's guide.
5. Equipment cleaning: Make sure to turn off the power supply and disconnect the conference units before cleaning. Clean only with a dry soft cloth.
6. To prevent from any hazard use only accessories recommended by the manufacturer.
7. To prevent from any hazard do not expose the equipment to moisture or humidity.
8. Do not place the equipment on any uneven or unstable stand. Original product package or appropriate package should be used to avoid damage caused by strong impacts during transportation.
9. Adequate ventilation is good for the maintenance of the equipment.
10. Power supply cords:
  - America, Japan: AC 110V~120V 60Hz
  - Asia, Europe: AC 220V~240V 50Hz
11. Grounding: 3-wire grounding plug.
12. To maintain the normal operation of the system, system extension cables should be discreetly routed to avoid being walked on or pinched by heavy items.
13. The quantity of connected radiators in one system should not exceed prescribed quantity (please refer to 3.1 for details). For service, please contact the nearest TELEVIC Service Center.
14. Do not remove the cover of the equipment at will; no hard conductor or liquid substance should be left inside the products.
15. For service, please contact the nearest TELEVIC Service Center. Do not disassemble the equipment by non-authorized personnel.
16. All TELEVIC products are guaranteed for 3 years excluding the following cases caused by personnel:
  17. Damage or malfunction caused by human negligence;
  18. Damage or malfunction caused by improper operating by the operator;
  19. Parts damage or loss caused by disassembling the product by non-authorized personnel.
20. Use ONLY specified connection cable to connect the system equipment.
21. Turn off the power supply and unplug the equipment from the power supply in case the equipment is not in use for a long time.
22. It will result in low battery and may damage the battery pack if the battery pack is not used for a long time. Please fully charge the battery for every three months.



TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT EXPOSE THIS EQUIPMENT TO RAIN OR MOISTURE.

**Caution:**

To reduce the risk of electric shock,  
DO NOT open covers, no useable  
serviceable parts inside.  
Refer servicing to qualified service  
personnel only.

This label appears on the rear of the unit due to  
space limitations



The lightning flash with an  
arrowhead symbol, with an  
equilateral triangle, is intended to  
alert the user to the presence of  
uninsulated 'dangerous voltage'  
within the products enclosure that  
may be of sufficient magnitude to  
constitute a risk of electric shock to  
persons.



The exclamation mark inside an  
equilateral triangle is intended to  
alert the user to the presence of  
important operating and  
maintenance (servicing) instructions  
in the literature accompanying the  
appliance.

**Caution:**

To prevent fire or shock hazard, DO  
NOT expose units to rain or moisture.



Attention: Installation should be  
performed by qualified service  
personnel only in accordance with  
the National Electrical or applicable  
local codes.



Power Disconnect: Units with or  
without ON – OFF switch have  
power supplied to the unit  
whenever the power cord is inserted  
into the power source; however, the  
unit is operational only when the ON  
– OFF switch is in the ON position.  
The power cord is the main power  
disconnect for all units.

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# 1. Introduction

This manual describes the Televic Aladdin system:  
language distribution through digital Infrared.

It gives a summary about the Aladdin series. It  
describes the system technology and gives the  
aspects of infrared distribution.

## 1.1. Summary

Aladdin is a digital infrared language distribution system. It uses both digital infrared audio transmitting and control technique dirATC and a special digital infrared chip. Aladdin can be used in simultaneous interpretation systems for multi-language conferences.

In simultaneous interpretation systems, the interpreter translates the speaker's speech, the translated audio transmits through the conference venue by modulated infrared radiation, and the delegates listen to desired language by infrared receiver via headphone.

The system can also be used for other audio signal distribution occasions, such as music distribution (mono as well as stereo).

The Aladdin series is compliant to IEC 61603-7 (Transmission of audio and/or video and related signals using infra-red radiation-Part 7: Transmission system for digital audio signals for conference and similar applications) and IEC 60914 (Conference systems-Electrical and audio requirements). Moreover, it is compatible with other IR systems, compliant to IEC 61603-7.

Parts of IEC 61603 are used in this manual for a better understanding of both theory and technique of the system.

The system is composed of one or more of the following:

- **Aladdin T8 8 channel digital infrared transmitter**
- **Aladdin RAD25 25W digital infrared radiator**
- **Aladdin R8 8 channel digital infrared receiver**
- **Aladdin CHC IR receiver charging case**



*Figure 1.1: System overview*

## 1.2. System Technology

This chapter describes the basic system concept, IR radiation, signal processing, audio quality modes and gives more information about carriers and channels.

### 1.2.1. Basic System Concept

The basic system concept is shown in Figure 1.2.

The system consists of a number (N) of audio sources, either analogue or digital, which are connected to a transmitter. The transmitter processes the audio signals into an electrical output to feed the infrared radiator (see section 1.2.3). The infrared signal is received by the infrared receiver that processes the signal and outputs an audio signal and/or associated data.

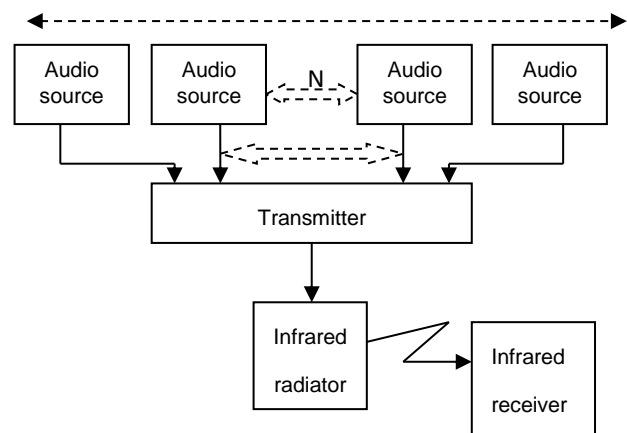


Figure 1.2: The basic system concept

### 1.2.2. IR Radiation

Aladdin series audio signal is based on transmission by modulated infrared radiation. Infrared radiation is part of the electro-magnetic spectrum, which is composed of visible light, radio waves and other types of radiation. Its wavelength is higher than that of visible light.

Conference hall privacy: the congress venue itself acts as a barrier to infrared signals escaping. As infrared is unable to pass through opaque objects such as walls the signal cannot be overheard. Moreover, Aladdin series does not emit radio radiation. Operating the system does not require a radio frequency license, anywhere in the world.

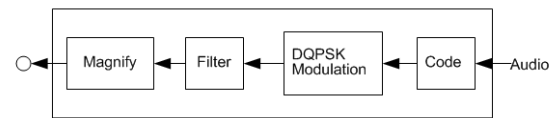
### 1.2.3. Signal Processing

Aladdin uses high frequency carrier signals (typically 2-6 MHz) to prevent interference by contemporary light sources. Fully digital audio processing guarantees a constant high audio quality.

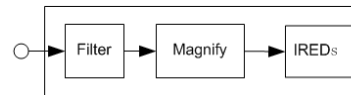
The signal processing in the transmitter consists of the following main steps (see figure 1.3):

1. Code – each analogue audio channel is converted to a digital signal; the digital signals are compressed to increase the amount of information that can be distributed on each carrier (compression ratio is related to required audio quality); groups of up to 4 digital signals are combined into a digital information stream. Extra redundancy information is added. This information is used by the receivers for error detection and correction.
2. Modulation – a high frequency carrier signal is phase-modulated with the digital information stream by DQPSK digital modulation technique.
3. Filter.
4. Magnify.
5. Radiation – up to 2 modulated carrier signals are combined and sent to the IR radiators, which convert the carrier signals to modulated infrared light.

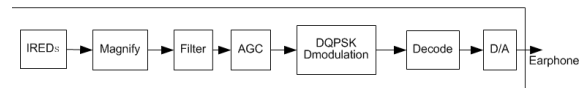
In the IR receivers, a reverse processing is used to convert the modulated infrared light to separate digital audio channels.



(a) Digital infrared transmitter schematic



(b) Digital infrared radiator schematic



(c) Digital infrared receiver schematic

**Figure 1.3: Overview of the signal processing**

### 1.2.4. Audio Quality Modes

Aladdin can transmit audio in 4 different quality modes:

- Mono, standard quality, maximum 8 channels
- Mono, perfect quality, maximum 4 channels
- Stereo, standard quality, maximum 4 channels
- Stereo, perfect quality, maximum 2 channels

The standard quality mode uses less bandwidth and is used for transmitting speech. The perfect quality mode gives near CD quality and is used for transmitting music.

### 1.2.5. Carriers and Channels

Aladdin is transmitting within the 2–6 MHz frequency band (IEC 61603 BAND) (see Figure 1.4). It can transmit 2 different carrier signals. Figure 1.5 shows the wideband allocation of Band IV.

Each carrier can carry up to 4 audio channels. The exact number of channels per carrier depends on the selected quality modes. Stereo signals use twice as much bandwidth as mono signals; perfect quality uses twice as much bandwidth as standard quality.

A mix of channels with different quality modes can be chosen for each carrier, with the total bandwidth not exceeding the available bandwidth. The table below lists all possible channel combinations per carrier:

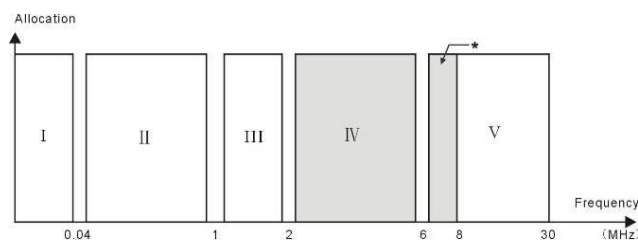


Figure 1.4: Standard band of Aladdin infrared language distribution system

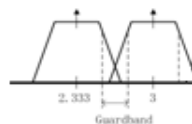


Figure 1.5: Band allocation of BAND

Table 1.1: The numbers and quality modes of channels per carrier

Possible number of channels per carrier	Channel quality				Bandwidth
	Standard Mono	Perfect Mono	Standard Stereo	Perfect Stereo	
4					4 x 10 kHz
2		1			2 x 10 kHz and 1 x 20 kHz
2			1		2 x 10 kHz and 1 x 10 kHz (left) and 1 x 10 kHz (right)
		1	1		1 x 20 kHz and 1 x 10 kHz (left) and 1 x 10 kHz (right)
			2		2 x 10 kHz (left) and 2 x 10 kHz (right)
		2			2 x 20 kHz
				1	1 x 20 kHz (left) and 1 x 20 kHz (right)

The available carrier frequencies are in accordance with IEC 61603-7 :

- 2.333MHz
- 3.000MHz
- 3.666MHz
- 4.333MHz
- 5.000MHz
- 5.666MHz
- + 2 extra carriers
- 6.333MHz
- 7.000MHz

The used carrier frequencies are automatically set , and can't be set manually.

The first carrier used is 2.333MHz , the second is 3.000Mhz , etc.....

**Remark :** when Aladdin receivers are used in combination with a transmitter of another brand , the used carrier frequencies must be the same as would normally be used by the Aladdin transmitter in a similar channel configuration .

if the chosen carrier frequency is not correct , this will result in no audio received by the Aladdin receivers on some or all channels !

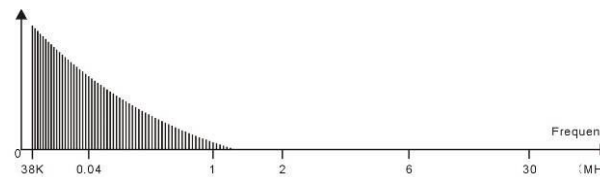
## 1.3. Aspects of Infrared Distribution

A good digital infrared language distribution system ensures that all delegates in a conference venue receive the distributed signals without disturbance. This is achieved by using a sufficient number of well-positioned radiators, so that uniform IR signal with adequate strength can be received at any place of the conference venue.

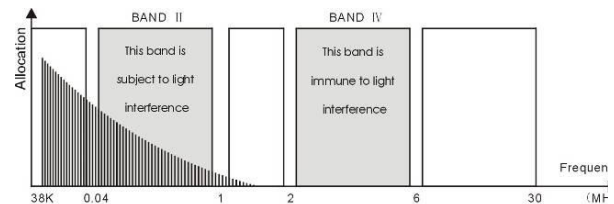
When planning an infrared distribution system several aspects influencing the uniformity and quality of the infrared signal should be considered. These are discussed in the next sections.

### 1.3.1. Ambient Lighting

Aladdin can be operated without any problem even if fluorescent lamps (with or without electronic ballast or dimming facility) such as TL lamps or energy saving lamps are switched on. (see Figure 1.6 and Figure 1.7).



*Figure 1.6: The interference band of an HF driven lighting system (fluorescent lamp)*



*Figure 1.7: The infrared language distribution system using BAND IV (2-6MHz) eliminates interference from high frequency lighting systems*

For venues with large, unscreened windows, more radiators should be added. For outdoor use, a site test will be required to determine the required amount of radiators. With sufficient radiators, the receivers will work well, even in bright sunlight.

### 1.3.2. Objects, Surfaces and Reflections

Just like visible light, infrared radiation is reflected from hard surfaces and refracted by hyaloid (glassy or transparent appearance) objects. Both objects in the conference venue and structure of the walls and ceilings will influence the distribution of infrared light.

Infrared radiation is reflected from almost all hard surfaces. Smooth, bright or shiny surfaces reflect well. Dark or rough surfaces absorb a large part of the infrared energy. Normally surfaces opaque to visible light are also opaque to infrared radiation.

Shadows from walls and furniture will influence the transmission of infrared light. This can be solved by using a sufficient quantity of radiators.

They should be positioned in a manner to provide an infrared field strong enough to cover the whole conference area.

**Take care not to direct radiators towards uncovered windows, or most of this radiation will be lost.**

### 1.3.3. Directional Sensitivity of the Receiver

The sensitivity of a receiver is at its best when it is aimed directly towards a radiator. To minimize the disadvantage of this aspect, Aladdin R8 receiver adopts an ingenious structural design with peculiar 270° ultra wide angle to get perfect IR capture and sound quality at any disposition (see Figure 1.8).

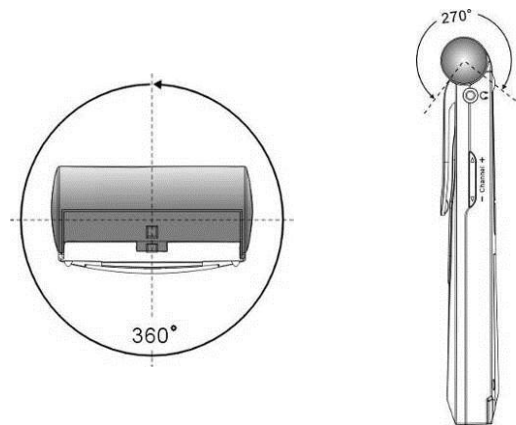


Figure 1.8: Directional characteristics of the receivers



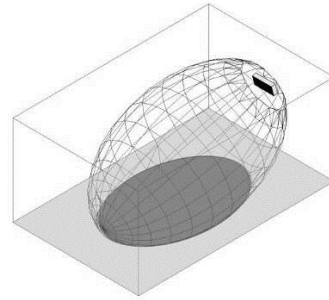
### 1.3.4. The Footprint of the

#### Radiator

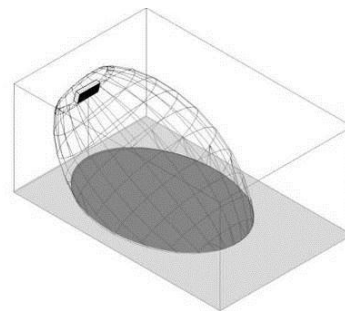
The number of transmitted carriers and the output power of the radiator determine the coverage area of a radiator. The total radiation energy of a radiator is distributed over transmitted carriers. The coverage area becomes proportionally smaller if more carriers are used. The receiver requires a strength of the IR signal of  $4 \text{ mW/m}^2$  per carrier to work well (resulting in an 80 dB S/N ratio for uninterrupted audio channels.).

The footprint is designed by the cross section of the 3-dimensional radiation with the reception level of participants (the dark grey area in Figure 1.9 to Figure 1.11). In this area, the direct signal is strong enough to ensure proper reception when the receiver is directed towards the radiator.

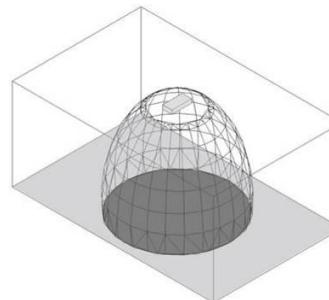
The size and position of the footprint depends on the mounting height and the angle of the radiator.



*Figure 1.9: The radiator mounted at 15° to the ceiling*



*Figure 1.10: The radiator mounted at 30° to the ceiling*



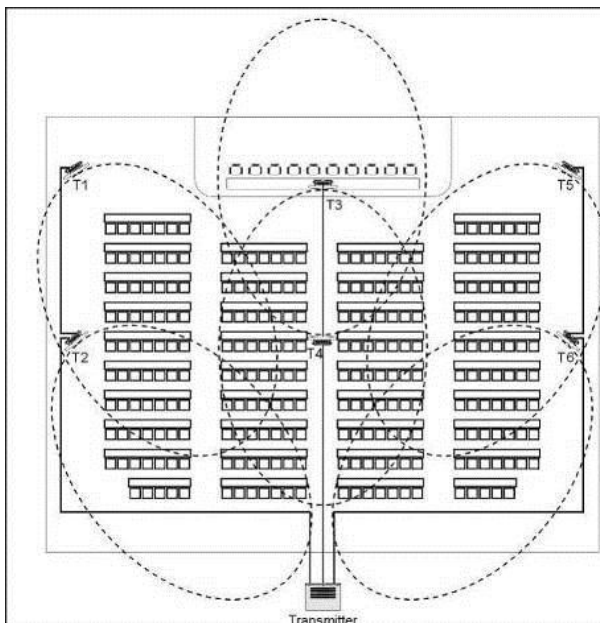
*Figure 1.11: The radiator mounted perpendicular (at 90°) to the ceiling*

### 1.3.5. Positioning the Radiators

Because infrared radiation can reach a receiver directly and / or via diffused reflections, it is important to take this into consideration when installing the radiators. For best reception quality, receivers should pick up direct infrared radiation. In addition reflections will improve the signal reception. In big conference halls, infrared signal will be blocked by the people in front of the receiver. For that reason the radiator should be installed at an appropriate height, usually not below 2.5 meters.

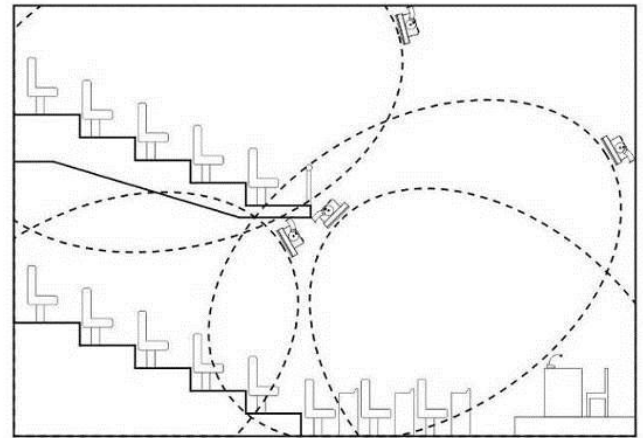
For concentrically arranged conference venues, radiators located high up and faced to the center from every angle can cover the area very efficiently. If the direction of the receiver changes, e.g. changing seat direction, the radiators can be installed in the corners of the room.

In the case the seating is always directed towards the IR emitting source, there are no radiators needed at the back (see Figure 1.12).



*Figure 1.12: Radiator positioning in a conference hall with auditorium seating and podium*

If the path of the infrared signals is blocked, e.g. under balconies, at least one additional radiator is needed to cover the 'shaded' area (see Figure 1.13).



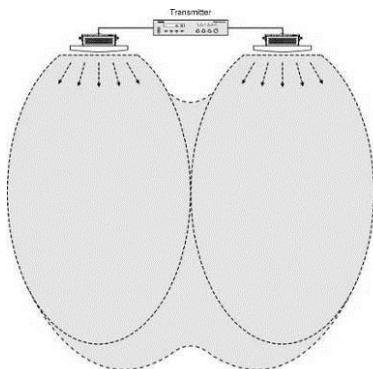
*Figure 1.13: Radiator for covering seats beneath a balcony*

### 1.3.6. Overlapped Footprints and Multipath Effects

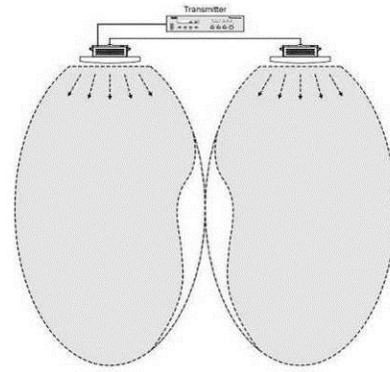
If footprints of two radiators overlap, the total coverage area may be larger than the sum of the two separate footprints. In an area with overlap effect, the individual radiation signals of two radiators are added, resulting in an increase of the radiation intensity, larger than the required intensity.

However, due to the differences in the delays of the signals from two or more radiators, the signals may cancel out each other (multipath effect). In a worst-case situation, loss of reception at some positions (black spots) may be the consequence.

Figure 1.14 and Figure 1.15 illustrate the effect of overlapped footprints and differences in signal delays.



*Figure 1.14: Increased coverage area caused by added radiation power*



*Figure 1.15: Reduced coverage area caused by differences in cable signal delay*

The lower the carrier frequency, the less susceptible the receiver is for differences in signal delays.

The signal delays can be compensated by adjusting the delay compensation switches on the radiators (see section 3.6).



## 2. Digital Infrared Transmitter

This chapter describes the Aladdin T8 digital infrared transmitter. It gives an overview of the transmitter with a front and rear view. It describes the installation with mounting brackets and gives an overview of the typical system configurations. The menu and submenus are given in a tree structure and there is an explanation on how to use the menus.

### 2.1. Overview

Aladdin T8 can be connected to the Televic conference central units CPU5500 and Confdea CU directly or via an AOP5500/9 or AOP2500 respectively. Via these central units it can be connected to other discussion and voting units or interpretation desks. It can also be used as a stand-alone system for distributing external signals.

Aladdin T8 is suitable for either tabletop or 19-inch rack mounting using. Four feet (for tabletop) and two brackets (for rack mounting) are supplied.

The following describes the front view of the AladdinT8 infrared transmitter.

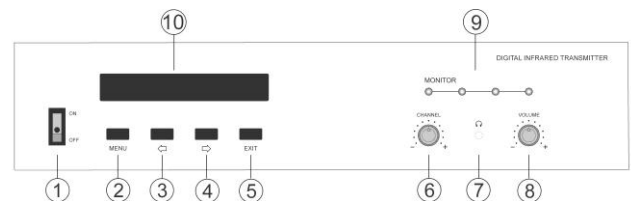


Figure 2.1: Transmitter front view

#### Figure 2.1:

1. Power switch with indicator (red)
2. "MENU" button
  - a. Under current state, press "MENU" button to go to main menu;
  - b. Under main menu, press "MENU" go to sub menu;
  - c. Select/Deselect in network configuration.
3. "←" (Left) button
4. "→" (Right) button
5. "Exit" button
6. Monitor channel select knob
7. Monitor headphone interface – Ø 3.5 mm jack for stereo monitor headphone
8. Monitor volume control knob
9. Mini IR radiator – 4 IREDS transmitting the same infrared signal as the radiator output for monitor purpose.
10. Display – 256×32 LCD. Display the status of the transmitter and the menu of system

configuration.

The following describes the rear view of the Aladdin T8 infrared transmitter.

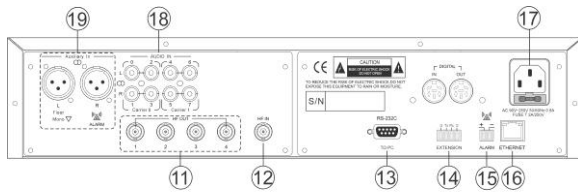


Figure 2.2: Transmitter rear view

**Figure 2.2:**

11. HF signal output – 4 BNC connectors for output HF signal to radiator. To each connector, up to 30 radiators can be connected.
12. HF signal input – 1 BNC connector for receiving HF signal from other transmitter.
13. RS-232
14. Extension interface (see merging mode)
15. Fire alarm linked trigger interface – When this switch is closed, the emergency audio signal on the Aux-R input is distributed to all output channels and overriding all other audio inputs.
16. Ethernet – TCP/IP protocol was adopted for communication between main unit and computer. Remote control even wireless touch screen control can be achieved via Ethernet interface.
17. Power supply (AC 110V-240V)
18. Audio signal input – 8 audio connectors to connect external unbalanced audio input signals.
19. Auxiliary audio input – 2 female XLR connectors for external audio inputs to connect auxiliary balanced audio signals such as music, floor language or emergency audio signal.

## 2.2. Installation

Transmitter can be fixed in a standard 19-inch cabinet. The transmitter is equipped with a pair of fixing brackets (1). First unscrew the lateral screws (2) from the housing. Then fasten the brackets with these screws and put the CMU in the cabinet. Finally fix the four holes (3) up with screws.



Figure 2.3a: Installation of transmitter

In addition, 1U metal stripes are included to be installed between the transmitters in the cabinet. This can be used for the ventilation and the cooling off the transmitter. Fix up the four holes (3) with screws.



Figure 2.4b: Installation of transmitter

## 2.3. Connection

Typical system connection includes connection:

- to Televic conference system
- to external audio sources
- to emergency signal switch
- to another transmitter

### 2.3.1. To Televic Conference

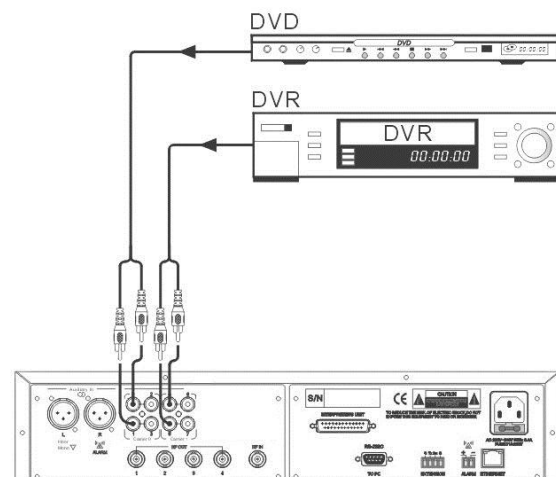
#### System

The Aladdin T8 infrared transmitter can be connected to the Televic central units Confidea CU and CPU5500 directly or via an AOP5500/9 or AOP2500 respectively.



### 2.3.2. To External Audio Sources

Aladdin T8 transmitter has 8 channels audio inputs for connecting to external unbalanced audio sources (such as other brand conference systems) or for music distribution.



*Figure 2.5: Transmitter connected to external audio sources*

### 2.3.3. To Emergency Signal Switch

To use the emergency function, fire alarm linked trigger interface (normally open) must be connected to the emergency switch connector. When the switch is closed the audio signal on the Aux-Right input is distributed to all output channels and overriding all other audio inputs.

“ALARM” will be displayed at this moment.

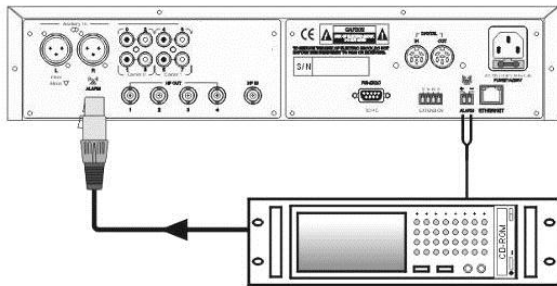


Figure 2.6: Transmitter connected to emergency signal switch

### 2.3.4. To Another Transmitter

#### ■ Bypass (master + bypass) mode

The transmitter can be operated in bypass mode to loop-through the IR radiator signals from another transmitter. Multi room application can be achieved by setting the transmitter in the main room to “Master” mode and the transmitters in other rooms to “Bypass” mode. One of the 4 radiator outputs of the master transmitter is connected with an RG-58 cable to the radiator signal loop-through input of the bypass transmitter (see Figure 2.7). The 2 transmitters should be set to “Master” and “Bypass” respectively (see section 2.5.6).

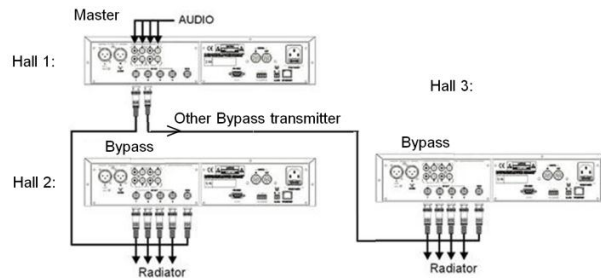


Figure 2.7: Transmitter connected to another transmitter in bypass mode



■ **Combination (master + slave) mode**

Aladdin T8’s unique merging function can combine two N channels transmitters as one 2N channels system (maximum 16 channels). It can be achieved by setting the transmitter which is connected to radiator(s) to “Master” mode and the other transmitter to “slave” mode. One of the 4 radiator outputs of the slave transmitter is connected with an RG-58 cable to the radiator signal loop-through input of the master transmitter, and the EXTENSION interfaces of both transmitters must be connected by a cable. Transmitters should be set to “Master” and “Slave” separately.

**Note:**  
When a slave transmitter is connected for a first time to a master, by default, the carriers of the slave are disabled

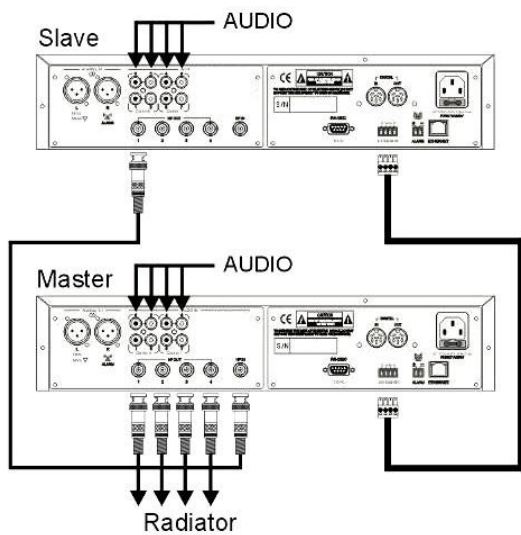


Figure 2.8: Transmitter connected to another transmitter in merging mode

**Connection explanation**

If 2 transmitters are operated in merging mode, the EXTENSION interfaces of both transmitters must be connected by a cable, according to Figure 2.9. This cabling is additionally required to the cabling shown in Figure 2.8.

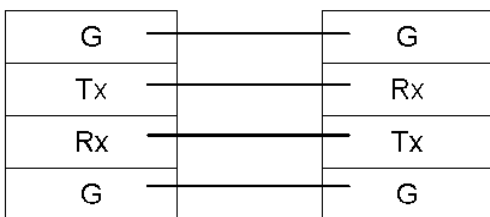
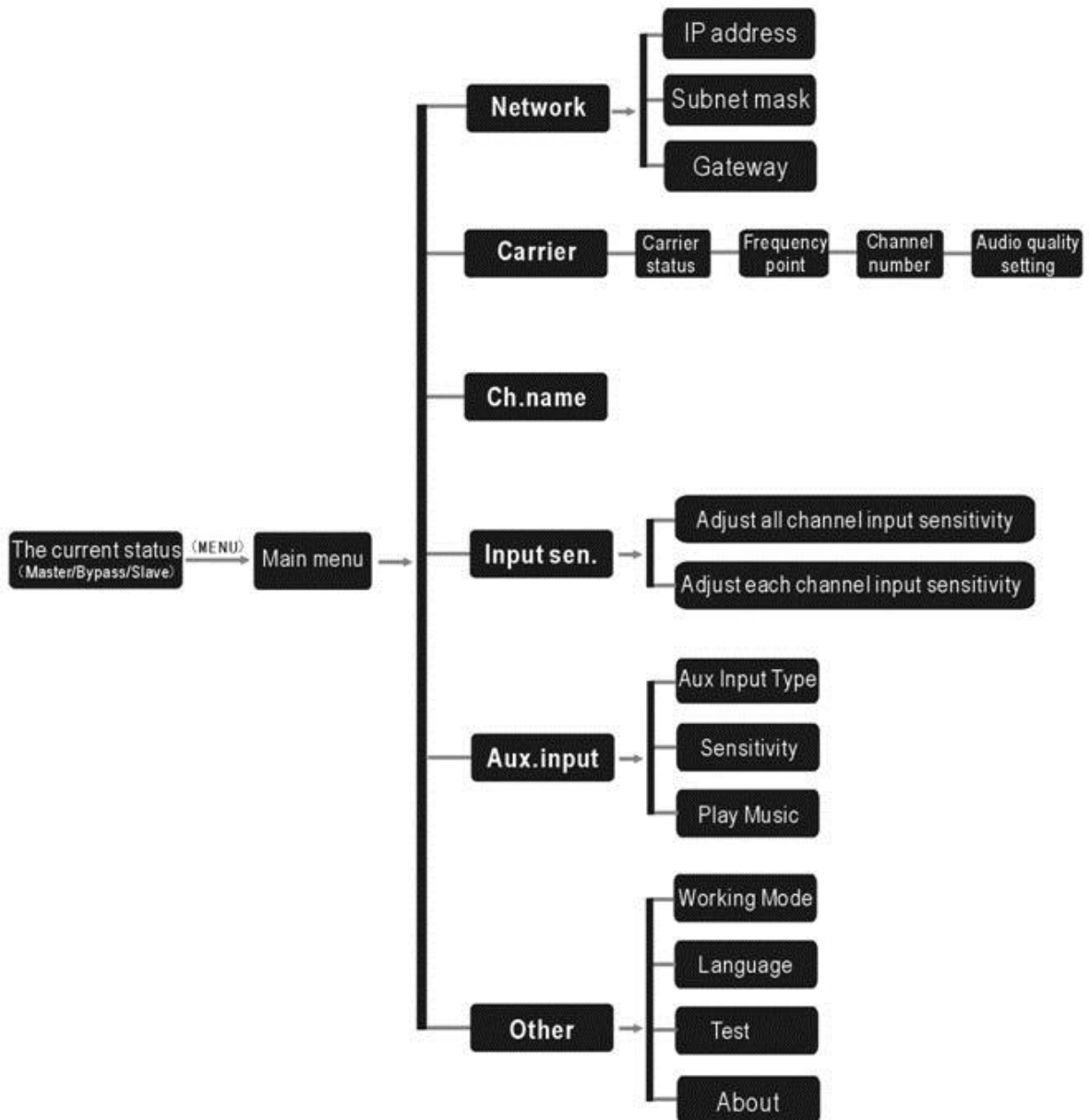


Figure 2.9: Wiring connection of the main unit in merging mode


## 2.4. Menu Structure



## 2.5. Configuration and Operation

### A) General Set Up of All Status of the Transmitter

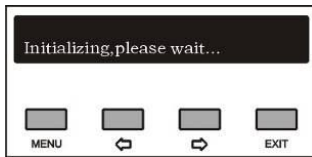
Via an interactive menu on LCD and 4 operation buttons.



**Note:**  
To switch back to the English version, please press and hold the "EXIT" button and switch on the transmitter.

### B) Starting Initialization:

Switch on Aladdin T8 transmitter. The current status of the transmitter will be displayed on the LCD screen:

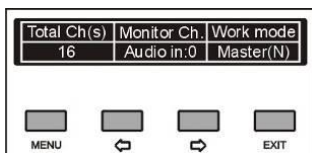


- ▶ If status is **"Master" mode (N) or (C)** display shows:

"Total Channels"

"Monitor Channel"

"Work Mode"



**"Master (N)"** = No slave transmitter connected

**"Master (C)"** = Transmitter in merge mode

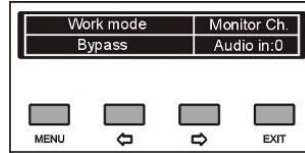
And

Slave transmitter connected

- ▶ If status is **"Bypass"** mode, display shows:

"Work mode"

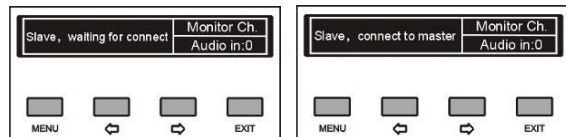
"Monitor Channel"



- ▶ If status is **"Slave"** mode, display shows:

"Connection status"

"Monitor channel"



**C) Accessing “Main” Menu:**

Press “Menu” button. Depending on transmitter status, display shows the terms:

- ▶ In “**Master**” mode :    → “Network”  
                                  → “Carrier”  
                                  → “Channel name”  
                                  → “Input sensitivity”  
                                  → “Aux. input”  
                                  → “Other”
  
- ▶ In “**Slave**” and “**Bypass**” mode: → “Network”  
  → “Work mode”  
  → “Language”  
  → “About”

The current chosen term (e.g. “Network”) is highlighted.

- Press “MENU” button to go to corresponding submenus.
- To switch from term to term use “↔/⇒” button.
- To exit current menu and to return to upper level menu use “EXIT” button.

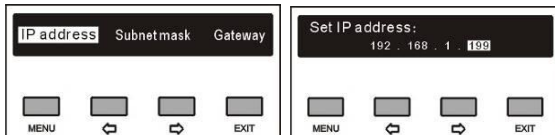
## 2.5.1. Network

“Network” includes 3 submenus:

→ “IP Address”

→ “Subnet Mask”

→ “Gateway”



### 1) Setting Up Unique “IP Address” for the Transmitter:

- Use “←/→” button to switch between the four numbers
- Use “MENU” button to edit selected number
- Use “←/→” button to decrease/increase the number. Press and hold “←/→” button for a longer time to change the number quickly (= auto repeat)
- Use “EXIT” to return to high level menu.

### 2) Setting Up “Subnet Mask” and “Gateway”:

Same chronological order as for “IP address” set up.



**Note:**

“IP address”, “Subnet Mask” and “Gateway” of the system software should correspond with the above transmitter settings, else connection error will occur

All menu setup except “Network” and “Input sen.” use “MENU” button to exit saving changes, and use “EXIT” to exit discarding changes.

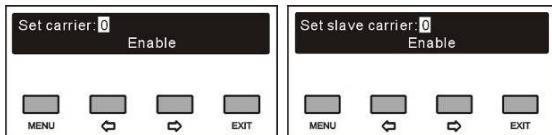
### 2.5.2. Carrier

“Carrier” includes 4 submenus:

- “Set up status”
- “Channel number”
- “Frequency point”
- “audio setting”

#### 1) Enable/Disable Current Carrier

- Use “←/→” button to enable or disable current carrier
- Use “MENU” button to save;



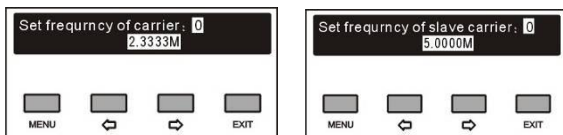
“Master” mode menu      “Slave” mode menu

► If “Enabled”:

- Press “MENU” button to setup current carrier
- The frequency of the current carrier will be displayed. (figure 1.5 shows the band allocation).

► If “Disabled”:

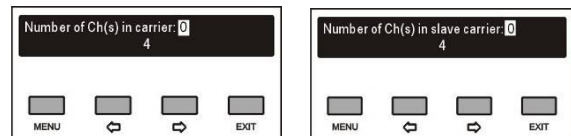
- press “Menu” to return to high level menu



“Master” mode menu      “Slave” mode menu

#### 2) Channel Number Configuration

- Press “MENU” button at this interface to go to channel number configuration, as shown in figure below.
- Use “←/→” button to increase or decrease channel number. The exact channel number depends on the audio quality (see 1.2.5).
- Use “MENU” button to save channel number setting



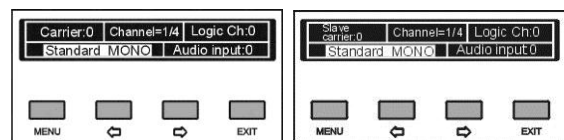
“Master” mode menu      “Slave” mode menu

#### 3) Audio Quality Setting

- Go to audio quality setting interface.
- Press “MENU” button to switch channel number (in the case of more than one channel). “Audio input:” indicates current channel corresponding Aladdin T8 transmitter audio input channel.
- After having selected channel number(s), use “←/→” to adjust audio quality.

**Audio mode includes:** → “Standard MONO”  
 → “Perfect MONO”  
 → “Standard STEREO”  
 → “Perfect STEREO”

Selectable audio quality depends on channel number (refer to section 1.2.5).



“Master” mode menu      “Slave” mode menu

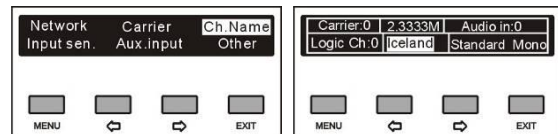
#### 4) Save Settings

- Use “MENU” button to save setting
- Go to next carrier configuration
- Repeat above until all carriers have been set up.

### 2.5.3. Channel Name

Assign a language name for every channel.

- Use “MENU” button to switch channel number
- Use “←/→” button to adjust current channel name (selectable language name refer to section 8.7)

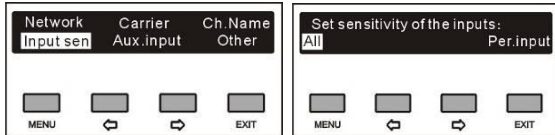


### 2.5.4. Input Sensitivity

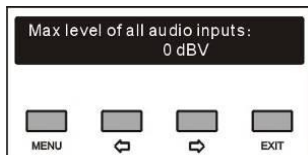
“Input sensitivity” includes 2 submenus:

→ “All”

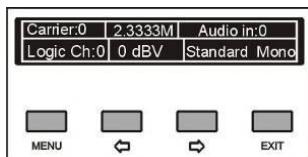
→ “Per Input”



- ▶ **“All”**: adjust all channel input sensitivity
- Use “←/→” button to adjust input sensitivity for all channels. Range from -12 dBV ~ +12 dBV.



- ▶ **“Per Input”**: adjust each channel input sensitivity separately
- Use “MENU” button to switch channel number
- Use “←/→” button to adjust input sensitivity for each channel. Range from -12 dBV ~ +12 dBV.



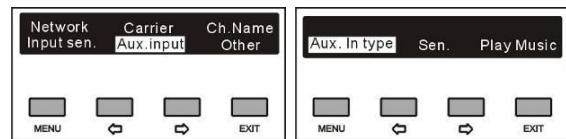
### 2.5.5. Aux Input

“Aux Input” (Auxiliary audio input) includes 3 submenus:

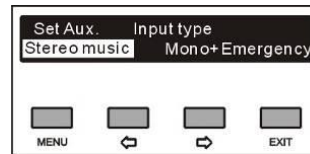
→ “Aux Input Type”

→ “Sensitivity”

→ “Play Music”



- ▶ **“Aux Input Type”**
- Use “←/→” button to select auxiliary input type between “Stereo Music” or “Mono + Emergency”.



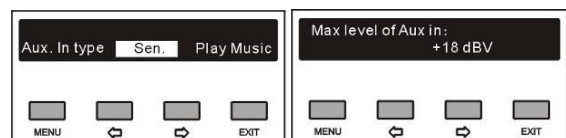
#### 1) “Stereo Music”:

If “Play music”, stereo music from 2 channels auxiliary audio input will be distributed to all output channels, usually for playing music when adjournment.

#### 2) “Mono + Emergency”:

Once the alarm signal turned on, emergency signal from Aux-R audio input will be distributed to all output channels on the premise that fire alarm linked trigger interface is closed (see section 2.2.3).

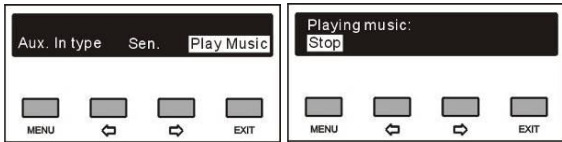
- ▶ **“Sensitivity”**
- Use “←/→” button to adjust auxiliary input level, range from -6 dBV ~ +18 dBV.





► “Play Music”

- If “Aux input type” is “Stereo music”, stereo or mono music from auxiliary audio input will be distributed to all output channels. “MUSIC” will be displayed at this moment.
- Use “MENU” button to stop and exit.



**Note:**

When a slave transmitter is connected to a master, channel input sensitivities of the slave are different then the input sensitivities of the master and therefore have to be set.

## 2.5.6. Other

“Other” includes 5 submenus:

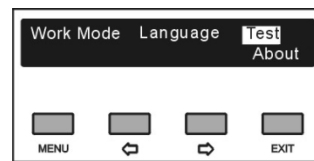
→ “Working Mode”

→ “Language”

→ “Test”

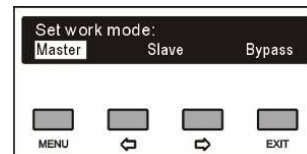
→ “Int. Unit”

→ “About”



► “Working Mode”

- Use “←/→” button to switch between “Master”, “Slave” and “Bypass”
- Use “MENU” button to confirm

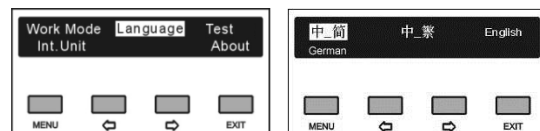


**Note:**

Transmitter needs to restart to implement working mode configuration.

► “Language”

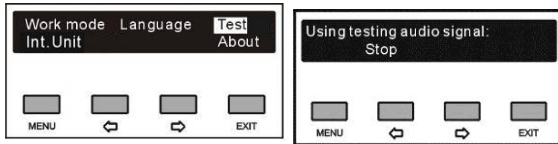
- Use “←/→” button to switch between “简体中文”, “繁体中文”, “German” and “English”
- Use “MENU” button to confirm



▶ **“Test”**

Transmitter goes to test mode and testing tone will be distributed to all output channels.

- Use “MENU” button or “EXIT” button to stop test mode.

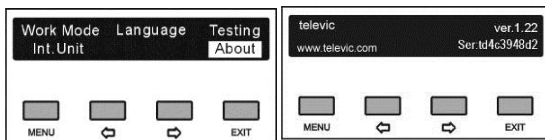


▶ **“Int. Unit”**

This menu is not used.

▶ **“About”**

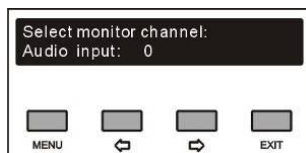
Transmitter firmware information will be displayed, including: version, TELEVIC information and product series number. Use any button to exit.



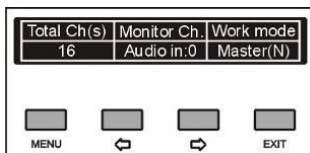
## 2.6. Monitor

For testing the transmitter, the front panel has a monitoring facility including a monitor channel selector, a monitor headphone jack and a monitor volume control (refer to fig. 2.1).

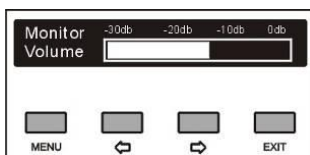
Monitor channel will only work if the transmitter is working. Plug the headphone into the monitor headphone jack, select monitor channel with the monitor channel selector. The audio signal input and auxiliary audio signal input of the transmitter will be monitored. The selected channel is displayed on LCD.



After monitor channel selection, LCD will return to transmitter status interface. The monitor channel is updated to the channel selected at last.



Monitor volume can be adjusted by monitor volume control between  $-30\text{dB}$  and  $0\text{ dB}$ . Default volume:  $-15\text{ dB}$ .





## 3. Digital Infrared Radiator

This chapter describes the Aladdin RAD25 digital infrared radiator.

### 3.1. Overview

This unit accepts carrier signals generated by the transmitter and emits infrared radiation, carrying 8 audio distribution channels. Radiators are connected to the HF (BNC) connectors of the IR transmitter. A maximum of 30 radiators, daisy chained connected, can be connected to each of these outputs.

The Aladdin RAD25 25W digital infrared radiator uses a universal power supply and automatically power on/off synchronously with the transmitter.

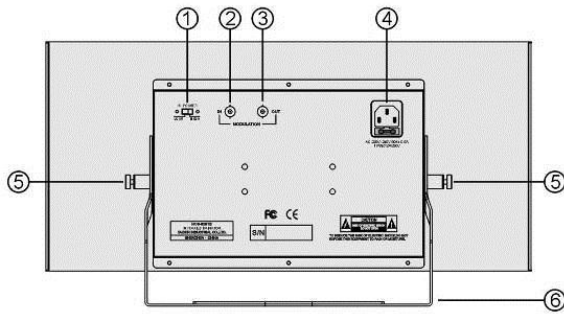
If the radiator does not receive a carrier, it switches to stand-by state automatically. If the radiator is overheating, it will automatically switch from full power to half power, or from half power to stand-by state.

#### Aladdin RAD25 Front View

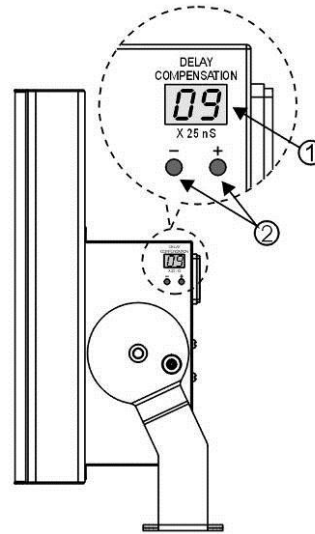


Figure 3.1: Radiator (front)

1. Power indicator
2. Temperature protection indicator
3. Input signal indicator
4. Fault indicator
5. Infrared emission area

**Aladdin RAD25 Rear View***Figure 3.2: Radiator (rear)*

1. Output power switch
2. Signal input
3. Synchronous output interface
4. Power supply
5. Angle adjust handle (135°/10 gear)
6. Bracket

**Aladdin RAD25 Side View***Figure 3.3: Radiator (side view)*

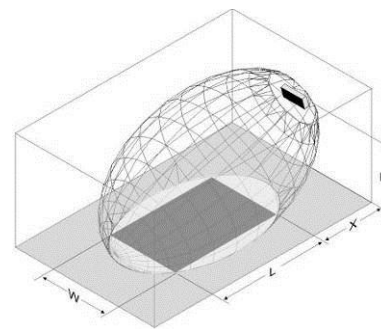
1. Delay compensation indicator
2. Delay compensation switch (-/+)

## 3.2. Position Planning

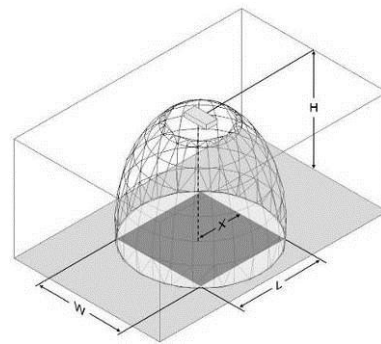
For position planning, please read section 1.3 to understand and consider every aspect of infrared distribution.

### 3.2.1. Rectangular Footprints

To determine the optimal number of infrared radiators needed to have complete coverage of a conference venue can only be done by performing a site test. However, estimation can be done by 'guaranteed rectangular footprints', see Figure 3.4 and Figure 3.5. The rectangular footprint is smaller than the actual footprint. Figure 3.5 shows a negative 'offset' X because the radiator is actually mounted beyond the horizontal point at which the rectangular footprint starts.



*Figure 3.4: A typical rectangular footprint for a mounting angle of 15°*



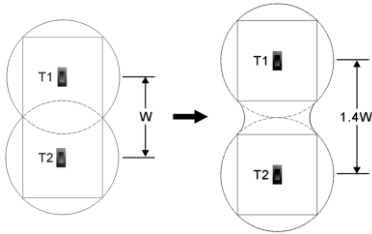
*Figure 3.5: A typical rectangular footprint for a mounting*

The guaranteed rectangular footprints of various numbers of carriers, mounting heights and mounting angles can be found in section 8.6.

**Note:**

The mounting height is the distance from the reception level and not from the floor to the radiator. Usually, the distance from the reception level to the floor is 1 m approximately.

For 2 carriers, a common calculation is given that if the receiver can pick up the signal from adjacent radiators the distance between these radiators can be increased by a factor 1.4 approximately (see Figure 3.6).



*Figure 3.6: The effect of overlapping footprints*

### 3.2.2. Planning Radiators

Plan the radiators by following procedure:

1. Define the positioning of the radiators by the recommendations in section 1.3.
2. Define the applicable rectangular footprints by consulting the table or calculating with the footprint calculation tool.
3. Draw a picture of the rectangular footprints in the layout of the room.
4. If the receiver can pick up the signals of from neighbored radiators in some areas, determine the overlapped effect and draw the picture of the footprint enlargement(s) in the layout of the room.
5. Check if there is sufficient coverage with the radiators at the intended positions.
6. If not, add additional radiators.

See Figure 1.12 and Figure 1.13 for examples of a radiator layout.



### 3.2.3. Cabling

Signal delay differences can occur because of the differences in the cable length from the transmitter to each radiator. In order to avoid the risk of black spots (see section 1.3.6), use equal cable length from transmitter to radiator if possible (see Figure 3.7).

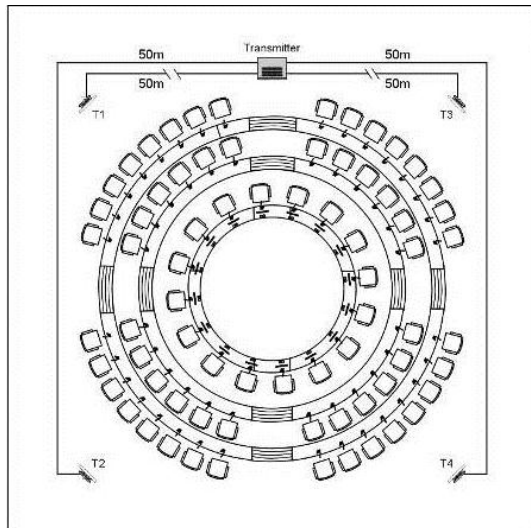


Figure 3.7: Radiators with equal cable length

If radiators are loop-through, the cabling between each radiator and the transmitter should be as symmetrical as possible (see Figure 3.8). The differences in cable signal delays can be compensated with the signal delay compensation switches on the radiators.

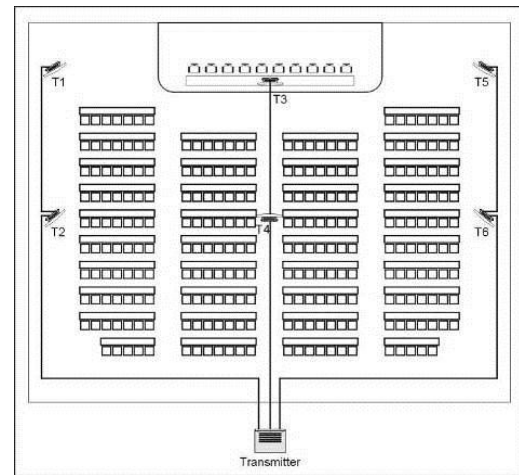


Figure 3.8: Symmetrical arrangement of radiator cabling

### 3.3. Mounting

The radiator can be permanently installed on the wall, under a ceiling or balcony by bracket. The mounting angle can be adjusted for optimal coverage through angle adjust handle.

A separate bracket is optional for wall mounting and a floor stand can be used for non-permanent installation.

**Note:**

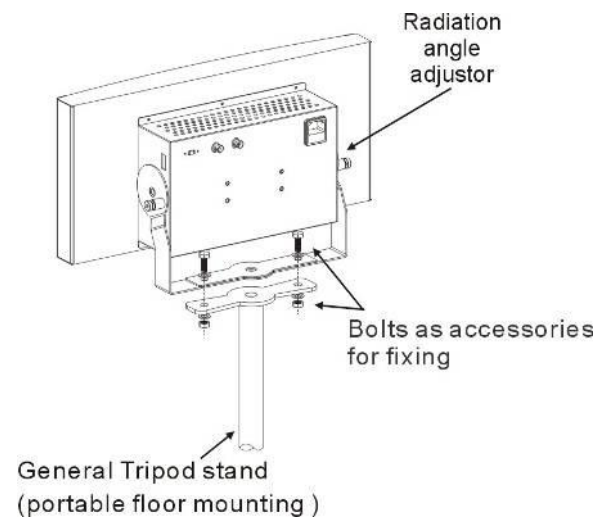
When in operation, the radiators may feel warm. It is normal and does not indicate a radiator fault or malfunction.

**Warning:**

Always make sure that natural airflow is not obstructed by ceilings, walls etc. when determining the position of the radiator. Leave plenty of space around the radiator to prevent overheating.

#### 3.3.1. Mounting on a Floor Stand

Fix the bracket of the radiator into the top of the floor stand with screw. The bracket is supplied with both metric and inch screw plate and is compatible with most stand floor stands.



*Figure 3.9: Mounting on a floor stand*

### 3.3.2. Wall Mounting

A separate bracket is optional for wall mounting (refer to Figure 3.10). The bracket can be fixed on to the wall by 4 screws.

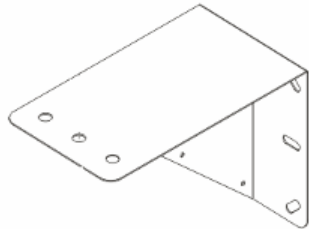


Figure 3.10: mounting bracket

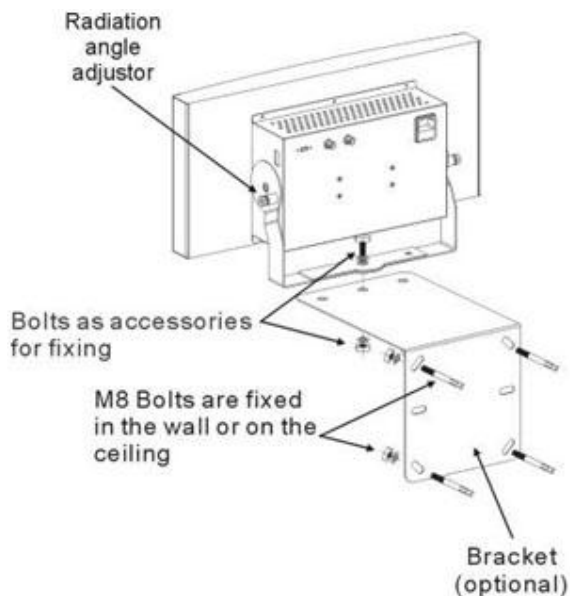


Figure 3.11: Wall mounting 1

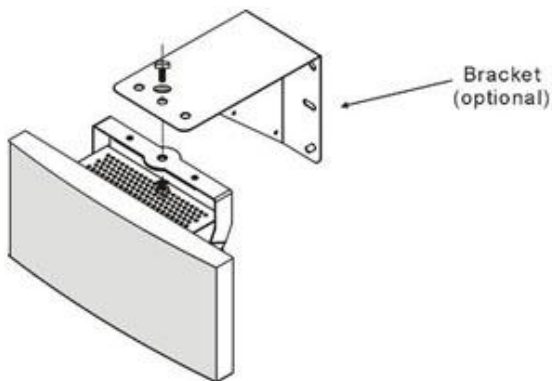


Figure 3.12: Wall mounting 2

### 3.3.3. Ceiling Mounting

The radiator can be fixed to the ceiling by using the built-in bracket. Please make sure to have enough space for a proper air flow around the radiator when select ceiling mounting.

In most cases, a ventilator is needed to prevent overheating.

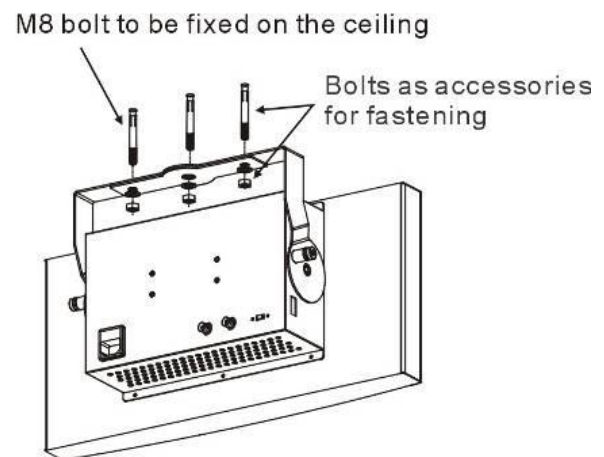


Figure 3.13: Ceiling mounting

### 3.3.4. Mounting on Horizontal Surface

If the radiator has to be installed on a horizontal plane (e.g. on the top of an interpreter booth), the distance between the radiator and the plane should be at least 4 cm to ensure enough airflow around the radiator. Normally, this can be achieved by using the built-in bracket as a support. If not, switch the radiator to half power. If the radiator is working at full power on top of an interpreter booth, the ambient temperature should not exceed 35°C.

### 3.4. Connecting to Transmitter

There are 4 functionally identical HF signal output interfaces on the transmitter. Each one can connect up to 30 Aladdin RAD25 radiators in daisy chain. The radiators are connected with RG-58 cables. The maximum cable length per output is 900m. Automatic cable termination is achieved by a built-in switch in the BNC connectors on the radiator.

**Note:**

For the automatic cable termination function, do not leave an open-ended cable connected to the last radiator in a loop-through chain.

### 3.5. Output Power Selection

The radiator can be switched to half power output. This is usually done when full power output is not needed, e.g. when a portable system is used in a small venue. Switch a radiator to half power if an adequate airflow cannot be guaranteed, e.g. if the radiator is mounted on the top of an interpreter booth. Reduce the power as often as possible to save energy and to increase the lifetime of the radiator.

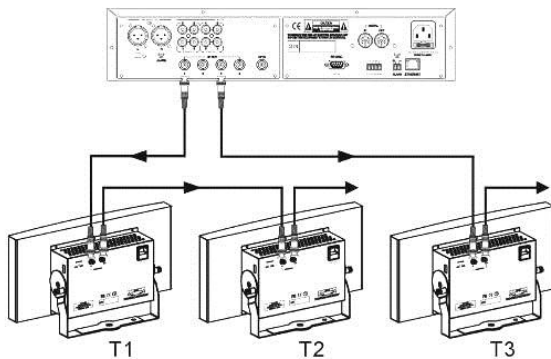


Figure 3.14: Radiators connected in daisy chain

## 3.6. Setting the Radiator Delay Switches

As described in section 1.3.6, signals picked up by the receiver from two or more radiators can cause black spots due to delay differences.

Signal delays reasons:

- Cable signal delay, caused by the cable transporting the signal from the transmitter to the radiator.
- Radiation signal delay, caused by the air transporting the signal from the radiator to the receiver.
- Transmitter signal delay, caused if two or more transmitters are used in a Bypass configuration.

To compensate the signal delay differences, the delay of each radiator can be increased. Signal delays can be set with the delay switch situated at the side of the radiator. Aladdin T8 transmitter has a digital display showing the current compensation value. The switch can be adjusted from "00" ("00" means no compensation) to "99". Compensation time is calculated by multiplying 25 ns with the switch set value. Thus compensation time varies between 25ns and 2475 ns.

In most cases the cable signal delays can be calculated manually using in addition the delay switch calculation tool (available on the documentation CD-ROM).

How to calculate the delay switch positions manually for systems with one, two or more transmitters will be described in the next sections. Refer to the delay switch calculation tool for information how to get a computed value for the delay switch position.

### 3.6.1. System with One Transmitter

There are no cable signal delays in systems with only one transmitter and radiators directly connected to the transmitter with cables of identical length. The delay switches on all radiators are to be set to zero.

Subsequently check whether to compensate for radiation signal delay (see section 3.6.3).

If the cable lengths differ from radiator to radiator, the delay switch parameter can be calculated with the formula:

$$X = \frac{(L_{MAX} - L) \times 5.6}{25}$$

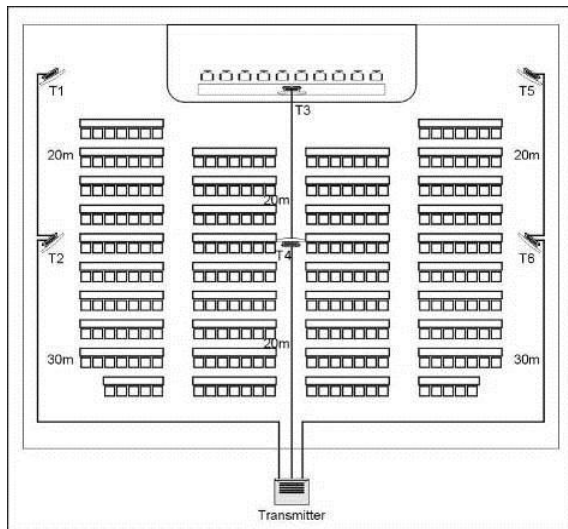
- Take signal delay rate as 5.6 ns/m (value as example for calculation only, real value depends on the cable type used)
- X : delay compensation parameter, displayed on the LCD
- $L_{MAX}$  : maximum cable length in the considered chain. For the most distanced radiator,  $L_{MAX}$  and L are identical.
- L : cable length between transmitter and radiator

Use the following procedure to determine the delay switch position based on cable lengths:

1. Measure the cable length L between the transmitter and every single radiator;
2. Determine the maximum cable length  $L_{MAX}$ ;
3. For each radiator calculate the cable length difference value  $L_{MAX} - L$ ;
4. To obtain the cable signal delays for each radiator; multiply the cable length difference of each radiator with the cable signal delay per meter;

5. Divide the calculated signal delay difference by 25. The rounded off figure is the signal delay switch position for the radiator;
6. If applicable, add delay switch positions for radiators under a balcony, (see section 3.6.3);
7. Set the delay switches to the calculated switch positions.

Figure 3.15 and table 3.1 illustrate the calculation of the cable signal delay.



**Figure 3.15: System with 5 radiators and measured cable lengths**

Table 3.1: Calculation of the cable signal delays

Radiator number	Total cable length L(m)	Cable length difference $L_{MAX}-L$ (m)	Cable signal delay per meter (ns/m)	Signal delay difference (ns)	Delay switch position
1	$30+20=50^*$	$50 - 50 = 0$	5.6	$0*5.6 = 0$	$0/25 = 0$
2	30	$50 - 30 = 20$	5.6	$20*5.6 = 112$	$112/25 = 4.48 \approx 4$
3	$20+20=40$	$50 - 40 = 10$	5.6	$10*5.6 = 56$	$56/25 = 2.24 \approx 2$
4	20	$50 - 20 = 30$	5.6	$30*5.6 = 168$	$168/25 = 6.72 \approx 7$
5	$30+20=50^*$	$50 - 50 = 0$	5.6	$0*5.6 = 0$	$0/25 = 0$
6	30	$50 - 30 = 20$	5.6	$20*5.6 = 112$	$112/25 = 4.48 \approx 4$

\*  $L_{MAX}=50$  m

**Note:**

The used cable signal delay per meter is only serving as an example. For your calculation, use the actual signal delay per meter value specified by the cable manufacturer.

### 3.6.2. System with Two or More Transmitters in One Room

When radiators in one multipurpose room are connected to two transmitters, an extra signal delay is added by:

- Transmission from master transmitter to bypass transmitter (cable signal delay)
- Transmission through the bypass transmitter.

Use the following procedure to determine the delay switch positions in bypass mode:

1. According to the procedures for a system with one transmitter, calculate the cable signal delay for each radiator in Hall-1 and Hall-2;
2. Calculate the signal delay between the master and the bypass transmitter (Table 3.2);
3. Add the master-to-bypass signal delay to each radiator connected to the bypass transmitter in Hall-2;
4. Determine the maximum signal delay;

5. For each radiator calculate the signal delay difference by subtracting the cable signal delay from the maximum signal delay
6. Divide the signal delay difference by 25. The rounded off number is the signal delay switch position for the radiator;
7. If needed, add delay switch positions to radiators under a balcony;
8. Set the delay switches to the calculated delay switch positions.



#### Note:

If a master-bypass mode is used for two rooms that are always separated, the delay switch positions can be calculated separately for each system and the delay caused by transmission from master to bypass transmitter can be ignored.

Figure 3.16, Table 3.2 and Table 3.3 illustrate the calculation of the extra master- bypass signal delay.

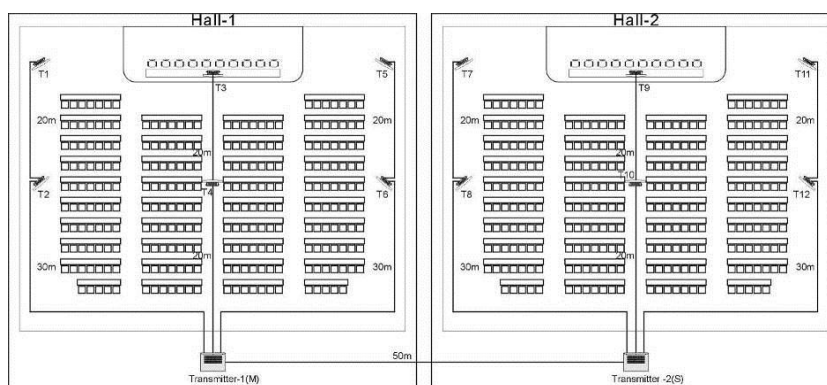


Figure 3.16: System with master and bypass transmitter in multipurpose room



Table 3.2: Calculation of the master-bypass signal delay

Master-bypass transmitter cable length (m)	Cable signal delay per meter (ns/m)	Master-bypass signal delay (ns)
50	5.6	$50 \times 5.6 = 280$

Table 3.3: Calculation of the delay switch positions of a system with two transmitters

Radiator number	Transmitter	Cable length to transmitter (m)	Cable signal delay (ns)	Master-bypass signal delay (ns)	Total signal delay (ns)	Signal delay difference (ns)	Delay switch position
Hall-1-T1	"Master"	50	$50 \times 5.6 = 280$	0	$0 + 280 = 280$	$560 - 280 = 280$	$280 / 25 = 11.2 \approx 11$
Hall-1-T2	"Master"	30	$30 \times 5.6 = 168$	0	$0 + 168 = 168$	$560 - 168 = 392$	$392 / 25 = 15.68 \approx 16$
Hall-1-T3	"Master"	40	$40 \times 5.6 = 224$	0	$0 + 224 = 224$	$560 - 224 = 336$	$336 / 25 = 13.44 \approx 13$
Hall-1-T4	"Master"	20	$10 \times 5.6 = 112$	0	$0 + 112 = 112$	$560 - 112 = 448$	$448 / 25 = 17.92 \approx 18$
Hall-1-T5	"Master"	50	$50 \times 5.6 = 280$	0	$0 + 280 = 280$	$560 - 280 = 280$	$280 / 25 = 11.2 \approx 11$
Hall-1-T6	"Master"	30	$30 \times 5.6 = 168$	0	$0 + 168 = 168$	$560 - 168 = 392$	$392 / 25 = 15.68 \approx 16$
Hall-2-T1	"Bypass"	50	$50 \times 5.6 = 280$	280	$280 + 280 = 560^*$	$560 - 560 = 0$	$0 / 25 = 0$
Hall-2-T2	"Bypass"	30	$30 \times 5.6 = 168$	280	$280 + 168 = 448$	$560 - 448 = 112$	$112 / 25 = 4.48 \approx 4$
Hall-2-T3	"Bypass"	40	$40 \times 5.6 = 224$	280	$280 + 224 = 504$	$560 - 504 = 56$	$56 / 25 = 2.24 \approx 2$
Hall-2-T4	"Bypass"	20	$10 \times 5.6 = 112$	280	$280 + 112 = 392$	$560 - 392 = 168$	$168 / 25 = 6.72 \approx 7$
Hall-2-T5	"Bypass"	50	$50 \times 5.6 = 280$	280	$280 + 280 = 560^*$	$560 - 560 = 0$	$0 / 25 = 0$
Hall-2-T6	"Bypass"	30	$30 \times 5.6 = 168$	280	$280 + 168 = 448$	$560 - 448 = 112$	$112 / 25 = 4.48 \approx 4$

\*The maximum signal delay is 560 ns



## 4. Digital Infrared Receiver

This chapter describes the Aladdin R8 digital infrared receiver.

### 4.1. Overview

Aladdin R8 IR receiver can receive up to 8 language channels. Both rechargeable Ni-HM battery and disposable battery can be used. The receiver is equipped with channel selector, volume control, power switch, Ø 3.5 mm stereo headphone jack, and charging circuit on the PCB. A LCD displays channel number with language name, received signal intensity, battery capacity and volume.

#### Aladdin R8 8 Channel Digital Infrared Receiver

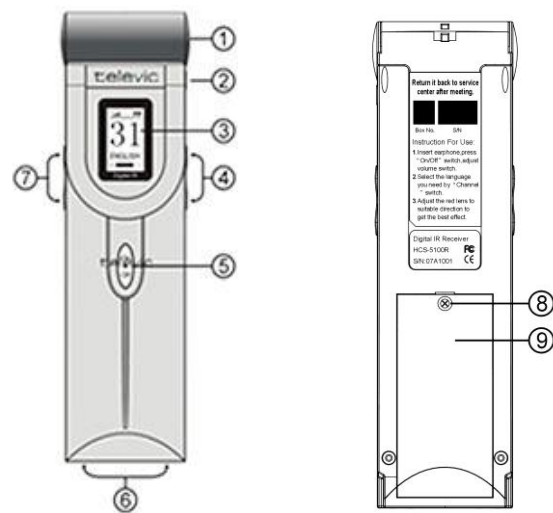


Figure 4.1: Aladdin R8 receiver

1. Infrared red filtering glass - for receiving IR signal
2. Headphone jack – Ø 3.5 mm stereo headphone jack
3. LCD - Displays channel number, language, battery capacity, signal intensity and volume.
4. Channel selector - An up/down switch to select audio channel. Channel number and language name will be displayed on LCD.
5. Power switch - When headphone is plugged in, the receiver changes to stand-by status. Press power switch to switch on receiver. Press and hold for 2s will return to stand-by status.
6. Charging contacts - Used for charging


7. Volume control - An up/down switch to adjust the volume, the volume will be displayed on LCD.
8. Screw to fix the battery cover
9. Battery pack or disposable batteries

**Note:**

When the receiver is not used, please disconnect the headphone. This ensures that the receiver is totally switched-off and no energy is consumed from the batteries or the battery pack.

## 4.2. Operation

The receiver only works if an headphone is connected and the receiver switches to stand-by state. Push shortly on the power switch button to switch on the receiver. The channel number is shown on the LCD. The channel can be changed with the channel selector. Channel number is in accordance with the channel configuration set up in the transmitter (see section 2.5.2).

When working, battery icon and antenna icon will be displayed on LCD to indicate current battery and signal status. A battery symbol “” is visible on the display when the batteries or the battery pack is almost empty and needs recharging, but it still might work for 7~8 hours. When the signal is interrupted for a short time, the receiver mutes the headphones output. If the IR receiver does not get an adequate IR signal for more than 1 minute (e.g. when a delegate leaves the conference room), the receiver automatically switches to stand-by state.

The volume can be adjusted and displayed on LCD.

To switch the receiver manually to stand-by mode, simply press and hold the on/off button for more than 2 seconds. If the headphone is disconnected, the receiver is automatically switched off.

The infrared receivers are operable either with disposable batteries (2xAA alkaline cells) or with a rechargeable battery pack (Aladdin BP).

Install the batteries or the battery pack with the correct polarity, as indicated in the battery compartment. A separate connection cable is required if a battery pack is used. The charging circuitry will not work if this cable is missing, preventing thus also charging of disposable batteries by mistake. The battery pack is equipped with a temperature sensor to prevent overheating during charging.

For more details about charging the battery pack please refer to chapter 5 and 6.

**Note:**

At the end of their technical lives both disposable batteries and battery packs should be discarded according to ecological standards, preferably at your nearest recycling station.

**Note:**

The charging circuitry will not work if the temperature sensor of the battery pack is missing or not connected, preventing thus also charging of disposable batteries by mistake.

## 4.3. Testing the Coverage Area

This chapter describes the testing of the coverage area and the reception test mode.

### 4.3.1. Reception Test Mode

The receivers can be switched to test-mode to indicate the reception quality for each carrier.

To activate the test-mode: push the channel selector to the up-position, and press the power switch button. A quality indication (00-99) will be displayed on LCD. Larger value stands for better signal reception.

The test mode is deactivated when the receiver is switched off.

### 4.3.2. Testing the Coverage Area

To make sure that the whole area is covered with adequate IR radiation and avoiding thus black spots, an extended reception quality test should be done. The test can be done in two ways:

#### Testing During Installation

1. Check that all radiators are connected and powered up.
2. Set the transmitter in the Test-mode (see section 2.3.6). For each channel, a test tone frequency will be transmitted.
3. Set a receiver to the highest available channel and listen to the received signal through the headphones.
4. Test all positions and directions (see next paragraph).

#### Testing During a Meeting

1. Set a receiver in the Test-mode. The quality of the received carrier signal is indicated on the display of the receiver.
2. Test all positions and directions (see next paragraph). The higher the value, the better the signal.

#### Testing all Positions and Directions

Walk around the conference venue under the test mode of the transmitter or the receiver; test every position where the signal must be received. If an area is detected as having bad reception or even no reception at all, two main causes should be taken into consideration:

##### Bad coverage

The receiver cannot pick-up adequate infrared radiation. This may be because the tested position is out of the footprint of the installed radiators or the radiation is blocked by obstacles such as a column, an overhanging balcony or other large objects.

Check whether you used the correct footprints for the system design or not. Check if the radiators used have a) sufficient output power and b) are not switched to half power operation by mistake. If bad reception is caused by a blocked radiation path, try to remove the blocking obstacle or add an extra radiator to cover the shaded area with more IR energy.

##### Black spots

IR signals coming from two radiators may cancel out each other (multipath effect) when reaching the receiver. Bad reception only happens on some special path. Multipath effect is confirmed being the cause of bad reception if the bad signal received by the receiver is improving the instant a radiator is a) changing its direction b) shaded -off or simply switched-off. IR radiation, reflected from a surface with a high reflectivity may also cause multipath effect.

Check that the signal delay compensation switches on the radiators are set to the correct value. Check the system design. If necessary, reduce the distance between the two radiators that cause the problem and/or add an extra radiator.

Please note that due to the physical characteristics of the signal distribution, it is not possible to avoid multipath effects completely.

## 4.4. Headphone

The headphones are connected to the receivers via an  $\emptyset$  3.5 mm stereo jack. Suitable headphone types include:

- TEL-151



- TEL-200



## 4.5. Ni-MH Rechargeable Battery Pack

Ni-MH battery pack is used with the Aladdin pocket receiver. The battery pack is equipped with a temperature sensor to prevent overheating during the charging process. The autonomy of a fully loaded battery pack is about 52h.





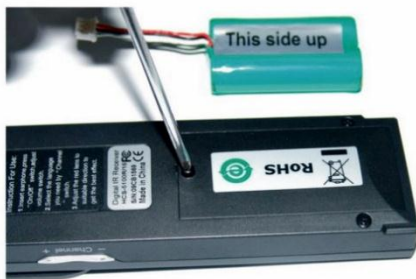
# 5. Assembly

## Instructions for the Battery Pack of the Receiver

**Step 1:** Tool needed a small "+" shape screw driver (Phillips type).



**Step 2:** Unscrew the battery cover from the receiver with the screw driver.



**Step 3:** Three cables from rechargeable battery pack are terminated with a mechanically coded connector.



**Step 4:** Plug the connector from the battery pack to the 3-pole socket in the battery holder in a correct direction.



**Step 5:** Press the lower part of the battery pack against the spring in the battery holder, make sure the label " This side up " is up.



**Step 6:** Press the upper part of the battery pack into the battery holder.



**Step 7:** Put the three cables on the space of the left side of the battery holder.

Note:

Make sure these three cables are not clamped by the alkaline battery plates and the upper part of the battery pack.



**Step 8:** Put the battery cover on the battery holder.



**Step 9:** Re-screw the cover then the battery pack is assembled.



## 6. Charging Case

This chapter describes the Aladdin CHC60 charging case. It gives an overview of the charging case and the charging procedure.

### 6.1. Overview

The Aladdin CHC60 charging case can charge up to 60 receivers at once. It uses universal power supply with automatic voltage matching. There is a charging indicator on the receiver. The charging circuit will check if the battery pack is present and control the charging process.



**Note:**

The charging case is only used to charge an Aladdin R8 receiver with an Aladdin BP battery pack. Please do not charge other receiver types with an Aladdin CHC or charge an Aladdin R8 with another charging unit.

### 6.2. View

The Aladdin CHC charging case looks like this.



Figure 6.1: Charging case

1. Power switch
2. Power input
3. Charging lattice

## 6.3. Charging Procedure

The charging procedure goes as follows:

1. Connect power core
2. Switch on
3. Insert receiver
4. Receiver charging indicator lights up

LED Status	Charging Status
On	Charging completed
Blinking	Charging
Off	Charger power off or receiver not inserted properly.



**Note:**

Pull out headphone before charging receiver.

Switch on the charger before inserting receiver. Inserting and removing receiver when the charger is powered on will not damage the receiver.

To maintain the service life of Ni-MH battery, please charge it for 24 hours before first service (until charging indicator keeps lighting).

The charger supplies fast charge during the first 10 minutes after inserting the receiver. So please do not frequently insert and remove receiver to protect the battery pack.

Continuously charging will not damage the receiver or the battery pack.

It will result in low battery and may damage the battery pack if the battery pack is not used for a long time. Please fully charge the battery for every three months.

Please check the battery pack regularly every 3 years whether the battery pack is leaking or not. If any leakage or corrosion is founded, please replace the battery pack. Please use Aladdin BP only. The battery pack should be replaced at least every 5 years.

## 7. Fault Diagnosis

Some simple trouble-shooting instructions are provided in this chapter.

If more serious faults arise, please contact qualified technician.

Fault	Solution
Transmitter display does not light up	<ul style="list-style-type: none"> <li>✧ Confirm that transmitter power cord is connected correctly and the power is switched on.</li> </ul>
Emergency does not work	<ul style="list-style-type: none"> <li>✧ Confirm that the emergency is connected correctly.</li> <li>✧ Confirm that "Playing music" is stopped.</li> </ul>
Radiator power light does not light up	<ul style="list-style-type: none"> <li>✧ Confirm that radiator power cord is connected correctly.</li> </ul>
Radiator input indicator does not light up	<ul style="list-style-type: none"> <li>✧ Confirm that the radiator input/output cable is connected correctly.</li> </ul>
Receiver does not work properly	<ul style="list-style-type: none"> <li>✧ If dry batteries are used, please make sure that the batteries have sufficient capacity and are assembled properly.</li> <li>✧ If rechargeable batteries are used, please make sure that the batteries are fully charged.</li> <li>✧ Confirm that headphone is connected correctly.</li> <li>✧ Switch on the receiver and confirm that channel indicator works properly.</li> <li>✧ Make sure that the receiver picks up sufficient IR signal and check the antenna signal intensity indicator.</li> <li>✧ Check the receiver by taking it in front of the mini radiator of the transmitter front panel.</li> <li>✧ Make sure that the volume is turned up.</li> <li>✧ Set the transmitter to test mode and check if the test tone is audible from the receiver.</li> <li>✧ If all receivers do not work properly at this spot, testing the coverage area;</li> </ul>
Receiver sound with distortion	<ul style="list-style-type: none"> <li>✧ Adjust the distance between receiver and radiator (commonly needs to be over 5 meters)</li> </ul>
Receiver sound with noise	<ul style="list-style-type: none"> <li>✧ Adjust the receiving distance.</li> <li>✧ Adjust the receiving direction.</li> <li>✧ Switch radiator to full output.</li> </ul>
The charging indicator of the receiver does not light up	<ul style="list-style-type: none"> <li>✧ Confirm that the charging case is working under proper conditions (see technical data).</li> <li>✧ Confirm that the receiver battery pack is connected correctly.</li> <li>✧ Confirm that the receiver is at normal temperature.</li> <li>✧ If the charging indicator still does not light up, please replace the battery pack.</li> </ul>
Receiver discharges quickly	<ul style="list-style-type: none"> <li>✧ Replace the rechargeable battery.</li> </ul>
Bad signal coverage effect	<ul style="list-style-type: none"> <li>✧ Testing the coverage area.</li> </ul>



## 8. Technical Data

This section describes the specifications of the full system, infrared transmitter, radiator, receiver, headphones, battery pack and charging case. It also describes the connection details and gives a list of the display languages.

### 8.1. System Specification

#### System Performance

Conforms to IEC 60914, the international standard for conference systems

Conforms to IEC 61603-7, the international standard for digital infra-red transmission of audio signals for conference and similar applications

#### Transmission Characteristics

<b>IR transmission wavelength</b>	870 nm
<b>Modulation frequency</b>	Carriers 0 to 5: 2 to 6 MHz, according to IEC 61603-7 Carriers 6 and 7: up to 8 MHz
<b>Protocol and modulation</b>	DQPSK, according to IEC 61603-7

#### System Audio Performance

(Measured from the audio input of an Aladdin T8 transmitter to the headphone output of an Aladdin R8 receiver.)

<b>Audio frequency response</b>	20 Hz to 10 kHz (-3 dB) at Standard Quality 20 Hz to 20 kHz (-3 dB) at Perfect Quality
<b>Total harmonic distortion at 1 kHz</b>	< 0.05%
<b>Crosstalk attenuation at 1 kHz</b>	> 80 dB
<b>Dynamic range</b>	> 80 dB
<b>Weighted signal-to-noise ratio</b>	> 80 dB(A)

#### Cabling and System Limits

<b>Cable type</b>	50 Ohm RG58
<b>Maximum number of radiators</b>	30 per HF output
<b>Maximum cable length</b>	900 m per HF output

**System Environmental Conditions**

Working conditions fixed/stationary/transportable

<b>Temperature range</b>	Transport: -40 °C to +70 °C Operating: 0 °C to +45 °C
<b>Max. Relative humidity</b>	< 95%
<b>Safety:</b>	Compliant to EN 60065
<b>EMC emission:</b>	Compliant to EN 61000-6-3, EN 55022
<b>EMC immunity:</b>	Compliant to EN 61000-4-3
<b>EMC approvals:</b>	CE, FCC
<b>Static resistance:</b>	Compliant to EN 61000-4-2
Power harmonic:	Compliant to EN 61000-3-2
Surge resistance:	Compliant to EN61000-4-5
EFT test:	Compliant to EN61000-4-4
Transient power-off test:	Compliant to EN61000-4-11



## 8.2. Infrared Transmitters (Aladdin T8)

### Physical Characteristics

Mounting:

Brackets for 19" rack mounting or fixing to a table top  
Detachable feet for free-standing use on a table top

<b>Dimensions (H×W×D)</b>	430 × 325× 99 mm
<b>Weight</b>	7.5 kg
<b>Color</b>	Black

### Electrical Characteristics

<b>Unbalanced audio inputs</b>	-12 to +12 dBV nominal
<b>Balanced audio inputs</b>	-6 to +18 dBV nominal
<b>Emergency switch connector</b>	emergency control input
<b>Headphone output</b>	32 Ohm to 2k Ohm
<b>HF input</b>	nominal 1 Vpp, minimum 10 mVpp, 50 Ohm
<b>HF output</b>	1 Vpp, 6 VDC, 50 Ohm
<b>Mains voltage</b>	110 to 260 V, 50 to 60 Hz
<b>Power consumption</b>	maximal 55 W
<b>Power consumption (standby)</b>	29 W

## 8.3. Radiators and Accessories

This chapter describes the physical, electrical and optical characteristics of the radiator.

### 8.3.1. Radiators (Aladdin RAD25)

#### Physical Characteristics

##### Mounting

Suspension bracket for direct ceiling mounting

Mounting plates for floor stands

Wall Mounting Bracket HCS-826TBK can be used for fixing radiator to wall surfaces

<b>Dimensions (H×W×D) without bracket:</b>	450×245×145 mm
<b>Weight without bracket:</b>	5 kg
<b>Color</b>	White

#### Electrical and Optical Characteristics

<b>Angle of half intensity</b>	±22°
<b>HF input</b>	nominal 1Vpp minimal 10 mVpp, 50 Ohm
<b>HF output</b>	1 Vpp, 6 VDC, 50 Ohm
<b>Mains voltage</b>	110/220 V, 50 to 60 Hz
<b>Power consumption</b>	75 W
<b>Power consumption (standby)</b>	8 W

### 8.3.2. Wall Mounting Bracket

#### Physical Characteristics

<b>Dimensions (H×W×D)</b>	200×285×203 mm
<b>Weight</b>	1.55 kg
<b>Color</b>	White

## 8.4. Receivers, Headphones, Battery Packs, Charging Case

This chapter describes the physical, electrical and optical characteristics for the receivers, headphones, rechargeable battery and the charging case.

### 8.4.1. Receivers (Aladdin R8)

#### Physical Characteristics

<b>Dimensions (H×W×D)</b>	155×46×24 mm
<b>Weight excl. batteries/battery pack</b>	80 g
<b>Weight incl. batteries/battery pack</b>	135 g
<b>Color</b>	Black

#### Electrical and Optical Characteristics

<b>IR irradiance level</b>	4 mW/m <sup>2</sup> per carrier
<b>Angle of sensitivity</b>	270°
<b>Headphone output level at 2.4V</b>	450 mVrms (speech at maximum volume, 32 Ohm headphone)
<b>Headphone output freq. Range</b>	20 Hz to 20 kHz
<b>Headphone output impedance</b>	32 Ohm to 2 kOhm
<b>Max. signal-to-noise ratio</b>	> 80 dB(A)
<b>Supply voltage</b>	1.8 to 3.6 V, nominal 2.4 V
<b>Power consumption normal (at 2.4 V)</b>	38 mA (32 Ohm headphone)
<b>Power consumption (unplugged headphone jack)</b>	0 mA
<b>Battery life (2xAA alkaline cells)</b>	70h
<b>Battery life (Rechargeable battery pack)</b>	52h

### 8.4.2. Headphones

- TEL-151 headphone
  - Used with the receiver/conference unit
  - Hi-Fi sound quality
  - 150 Ohm, Ø 3.5 mm mono jack
  - Single steel core cable
- TEL-200 headphone
  - Used with the receiver/conference unit
  - Hi-Fi sound quality
  - 150 Ohm, Ø 3.5 mm stereo jack

### 8.4.3. Ni-MH Rechargeable Battery Pack (Aladdin BP)

#### Physical Characteristics

<b>Dimensions (H×W×D)</b>	49×29×14.5 mm
<b>Weight</b>	55 g

#### Electrical Characteristics

<b>Voltage</b>	2.4 V
<b>Capacity</b>	2000 mAh

### 8.4.4. Charging Case (Aladdin CHC)

#### Physical Characteristics

<b>Dimensions (H×W×D)</b>	516×386×240 mm
<b>Weight</b>	12.3 kg
<b>Color</b>	Silver

#### Electrical Characteristics:

<b>Mains voltage</b>	AC110/220V
<b>Power consumption</b>	270 W (48 receivers charging)
<b>Power consumption (standby)</b>	7 W (no receivers in charging unit)

## 8.5. Connection Details

This chapter describes the cables, headphones connectors and the emergency switch.

### 8.5.1. Mains Cables

Blue	Neutral
Brown	Live
Green/Yellow	Earth/Ground

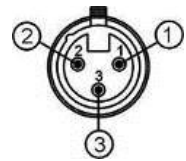
### 8.5.2. Audio Cables

#### 3-pole XLR Connector (female)

Pin1 Earth

Pin 2 Signal +

Pin 3 Signal -



#### Chinch Connector (male)

Pin 1 Signal +

Pin 2 GND



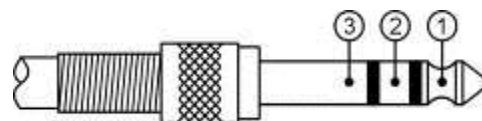
### 8.5.3. Headphones

#### 3.5 mm Jack Plug

Tip (1) Signal left

Ring (2) Signal Right

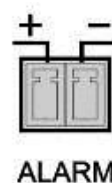
Sleeve (3) Electrical earth/screen



### 8.5.4. Emergency Switch

#### Terminal Block

Connect the emergency switch to +, -.



## 8.6. Guaranteed Rectangular Footprint

			Aladdin RAD25			
NO. of carriers	Mounting height H(m)	Mounting angle	Area A(m <sup>2</sup> )	Length L(m)	Width W(m)	Offset X(m)
1	2.5	0	648	36	18	6
	5	15	646	34	19	6
		30	493	29	17	4
		45	300	20	15	2
		60	195	15	13	0
		90	121	11	11	-5.5
	10	15	612	34	18	8
		30	576	32	18	5
		45	425	25	17	2
		60	320	20	16	-1
		90	225	15	15	-7.5
	25	30	416	26	16	12
		45	375	25	15	6
		60	432	24	18	1
		90	289	17	17	-8.5
	2	2.5	15	312	24	13
5		15	325	25	13	5
		30	252	21	12	3
		45	165	15	11	1
		60	130	13	10	-1
		90	100	10	10	-5
10		30	273	21	13	5
		45	240	20	12	2
		60	204	17	12	-1
		90	121	11	11	-5.5
25		60	204	17	12	3
		90	169	13	13	-5

(The mounting height is the distance from the reception level and not from the floor).

## 8.7. Display Language List

No	Chinese	English	Abbreviation	No	Chinese	English	Abbreviation
1	原声	Floor	Flo	32	亚美利亚语	Armenian	ARM
2	阿尔巴尼亚	Albanian	ALB	33	阿塞拜疆语	Azerbaijani	AZE
3	阿拉伯语	Arabic	ARA	34	巴厘语	Balinese	BAN
4	保加利亚语	Bulgarian	BUL	35	孟加拉语	Bengali	BEN
5	加泰罗尼亚	Catalan	CAT	36	缅甸语	Burmese	BUR
6	汉语	Chinese	CHI	37	白俄罗斯语	By Russian	BEL
7	捷克语	Czech	CZE	38	科西嘉语	Corsican	COS
8	丹麦语	Danish	DAN	39	爱尔兰语	Irish	IRI
9	荷兰语	Dutch	DU	40	哈萨克语	Kazakh	KAZ
10	英语	English	ENG	41	吉尔吉斯语	Kirghiz	KIR
11	芬兰语	Finnish	FIN	42	老挝语	Lao	LAO
12	法语	French	FR	43	蒙古语	Mongolian	MON
13	德语	German	GER	44	尼泊尔语	Nepali	NEP
14	希腊语	Greek	GRE	45	塔吉克语	Tajik	TGK
15	希伯来语	Hebrew	HEB	46	泰语	Thai	THA
16	匈牙利	Hungarian	HUN	47	藏语	Tibetan	TIB
17	印度尼西亚	Indonesian	IND	48	土库曼斯坦	Turkmen	TUK
18	意大利语	Italian	ITA	49	乌克兰语	Ukrainian	UKR
19	日语	Japanese	JAP	50	越南语	Vietnamese	VIE
20	韩语	Korean	KOR	51	粤语	Cantonese	CAN
21	马来语	Malay	MAL	52	克罗地亚语	Croatian	CRO
22	挪威语	Norwegian	NOR	53	斯洛伐克	Slovak	SLO
23	波斯语	Persian	PER	54	斯洛文尼亚	Slovenian	SLV
24	波兰语	Polish	POL	55	爱沙尼亚	Estonian	EST
25	葡萄牙语	Portuguese	POR	56	拉脱维亚	Latvian	LAT
26	罗马尼亚语	Romanian	ROU	57	立陶宛	Lithuanian	LIT
27	俄语	Russian	RUS	58	乔治亚语	Georgian	GEO
28	塞尔维亚语	Serbian	SER	59	冰岛语	Iceland	ICE
29	西班牙语	Spanish	SPA	60	音乐	Music	MUS
30	瑞典语	Swedish	SWE	61	未知语种	unknown	---
31	土耳其语	Turkish	TUR				

