

# dBZ-48

## User Manual





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**dBZ-48**

*Stereo zone mixer*

March 2010

**Serial number of this product:**

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## Important safety instructions

**CAUTION:** to reduce the risk of electric shock, do not remove cover (or back). No user-serviceable parts inside. Refer servicing to qualified service personnel.



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



The exclamation point within 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.

### Instructions

Before installing or operating the equipment, read all safety instructions, warnings and operating instructions. Heed all warnings. Follow all instructions. Keep all safety, installing and operating instructions for future reference.

### Installing and operating location

Do not use this apparatus near water. Do not expose this apparatus to drips or splashes. Do not place any objects filled with liquids, such as vases, on the apparatus.

Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. No naked flames, such as lighted candles, should be placed on the apparatus.

Do not install the apparatus in a confined space such as a book case or similar unit. Do not block any ventilation openings.

Ensure that foreign objects and liquids cannot get into the equipment.

Install in accordance with the manufacturer’s instructions. Only use attachments/accessories specified by the manufacturer.

Use only with the cart, stand, tripod, bracket or table specified by the manufacturer, or sold with the apparatus.



When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip over.

The apparatus should be located close enough to the AC outlet so that you can easily grasp the power cord plug at any time.

The mains plug, the appliance coupler or the mains switch is used as the disconnect device. Either device shall remain readily operable when the apparatus is installed or used.

### Power source and grounding

This product should be operated only from the power source indicated on the apparatus or in the operating instructions. If you are not sure of the type of power supply to your home, consult your product dealer or local power company.

Do not defeat the safety purpose of the polarised or grounding-type plug. A polarised plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.

Connect Class I construction apparatus to an AC outlet with a protective grounding connection.

Do not overload wall outlets, extension cords or integral convenience receptacles, as this can result in a risk of fire or electric shock.

Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptacles and the point where they exit from the apparatus.

Unplug this apparatus during lightning storms or when unused for long periods of time.

Batteries (battery pack or batteries installed) should not be exposed to excessive heat such as sunshine, fire or the like. Never dispose of batteries in a fire as they may explode and cause injury.

**CAUTION:** Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type.

### Cleaning, maintenance and servicing

Unplug the apparatus from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.

Do not attempt to service this product yourself, as opening or removing covers may expose you to dangerous voltage or other hazards. Refer all servicing to qualified service personnel.

Service is required when the apparatus has been damaged in any way, such as power-supply cord or plug damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally or has been dropped.

### Intended use

The equipment may only be used for the purpose described in the operation instructions. Never carry out any work on the equipment other than as specified in the operating manual.

Never push objects of any kind into this product through openings, as they may touch dangerous voltage points or short-cut parts, which could result in a fire or electric shock.

Children should never use the apparatus without close adult supervision.

**WARNING:** excessive sound pressure levels can cause hearing loss.

### Environmental precaution

Electrical and electronic equipment may contain hazardous substances for humans and their environment.



The “crossed out wheellie bin” symbol present on the device and represented above is there to remind one of the obligation of selective collection of waste. This label is applied to various products to indicate that the product is not to be thrown away as unsorted municipal waste. At the end of life, dispose of this product by returning it to the point of sale or to your local municipal collection point for recycling of electric and electronic devices.

Customer participation is important to minimize the potential effects on the environment and human health that can result from hazardous substances that may be contained in this product.



Please, dispose of this product and its packaging in accordance with local and national disposal regulations including those governing the recovery and recycling of waste electrical and electronic equipment. Contact your local waste administration, waste collection company or dealer.

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### **Register your product**

Please take the time to register your product on-line by typing the following URL in your browser:

<http://productregistration.apex-audio.eu/>

As well as registering the product on-line, please take the trouble to record the serial number of the unit in the space provided on page 3 of the manual, and keep the manual in a safe place.

Dear customer,

Thank you for buying the Apex dBZ-48. The dBZ-48 is a professional quality, 2-into-4 stereo zone mixer designed to manage audio distribution in a variety of sound reinforcement applications including live PA and installed sound systems.

## Product highlights

- Two stereo input channels
- Four stereo output channels
- Electronically-balanced inputs
- High-quality, servo-balanced output stages, capable of driving long cables
- Stereo/mono switch on each input and output channel, with LED indication
- Mute button on each input and output channel, with LED indication
- LED signal metering for L & R on each input and output channel
- Rugged all-metal chassis
- Professional quality XLR connectors throughout
- 1U 19" rack-mounting unit

## Foreword

The Apex dBZ-48 can be used in any situation where one or two stereo audio signals need to be routed and mixed at different levels to up to four destinations. The dBZ-48 will find many applications as a zoner or distribution amplifier in both live and installed audio situations.

When used as a zoner, any of the four outputs may receive either of the two inputs at any level, or a mix of them. Mono/stereo switching on both the inputs and the outputs makes matching the unit to a variety of sources and speaker systems simple.

An alternative installed sound application is to use the unit as a distribution amplifier, to drive rows of loudspeakers in an auditorium. It is common practice to drive speakers further from the stage at a higher level, and the dBZ-48 makes setting up such a system simple.

## About this manual

Carefully read all instructions and warnings before operating this appliance. Keep this manual in a safe place so that it can be referred to when required.

Latest manual revision can be downloaded from:  
<http://www.apex-audio.be/manufacturing/support/downloads/>

## Inspection and unpacking

This appliance has been carefully packed in the factory and the packaging was designed to withstand rough handling. Should the unit appear to have been damaged in transit, do not discard any of the packing material and notify the carrier immediately as they would be responsible.

Save all the packing materials for future use if you ever need to ship the unit again.

Please check the list below against the contents of the packaging. If any items are missing or damaged, contact the Apex dealer or distributor where you purchased the unit.

- dBZ-48 unit
- IEC AC power cable with mains plug
- This manual

## Operating environment

This appliance is designed to operate in moderate climates at a temperature between 5 and 40°C (41 - 104°F) with relative humidity no more than 60 %.

Should the unit be installed in an equipment rack, it is important to ensure that the operating temperature inside the rack does not exceed the upper limit. This could be the case where the rack contains power amplifiers. A cooling fan may be necessary in such installations.

## Power requirements

BEFORE you connect any unit to the mains, please make sure that your local AC supply is within the range of voltages required by the unit.

The dBZ-48 is designed to work from an AC supply between 100 V and 240 V, at a frequency between 50 and 60Hz. No AC voltage selector is provided as the device automatically adjusts to the incoming AC voltage.

Precautions should be taken so that the appliance is properly grounded at all times. **This unit must be earthed.**

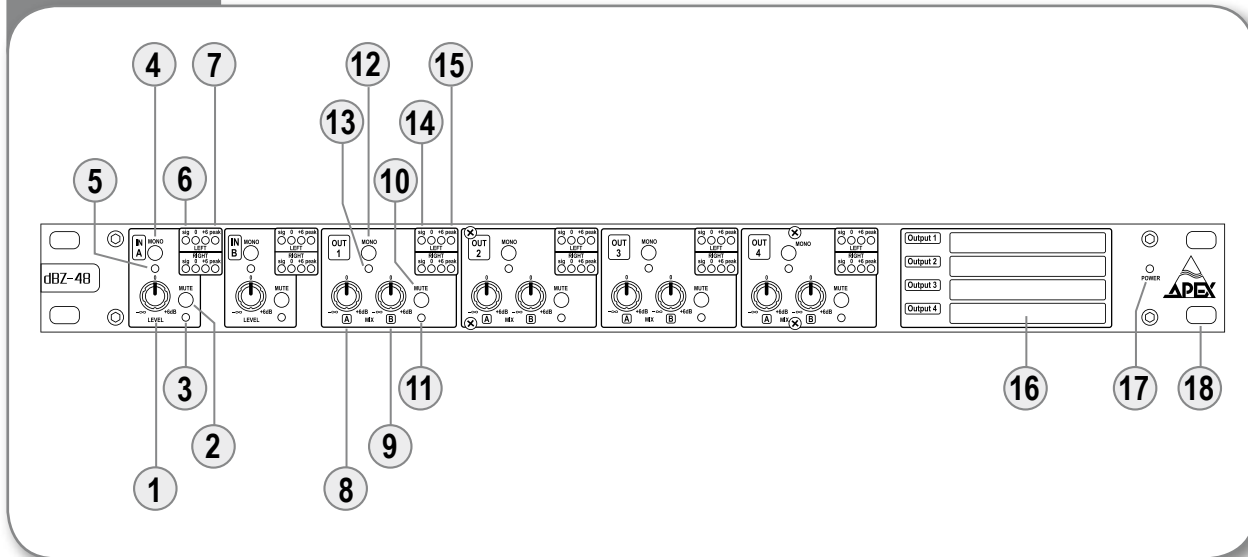
## Installation

If the unit is brought into a warm room from a cold environment, internal condensation may occur. Wait an hour or two before switching it on so that it can reach the ambient temperature.

Although this unit is intended for installation in a standard 19-inch rack it can nevertheless be used freestanding. If the unit is installed in a flight-case or in an equipment rack, fix the unit with all four screws through the front panel holes. For normal use no extra support is needed, but in more extreme conditions, such as on the road, we recommend the unit is supported at the rear.

Allow at least 10 cm (4 inches) at the back, front and sides of the unit for sufficient ventilation.

## Front panel



## Front panel

### Input Controls:

Front panel controls for **IN A** are described: those for **IN B** are identical.

- ① **IN A LEVEL** is a stereo control adjusting input stage gain, with range from  $-\infty$  to +6 dB. The control is centre-detented at unity gain (0 dB).
- ② Pressing the latching **MUTE** button removes Input A's signal from all outputs.
- ③ Red LED indicates Input Mute [2] is active.
- ④ The Left and Right channels of the Input may be summed with the **MONO** button. A 6 dB pad is inserted in mono mode to maintain mono/stereo level compatibility.
- ⑤ Green LED indicates Input Mono [3] is active.
- ⑥ Three LEDs indicating signal level for each channel of the stereo input: the green sig LED illuminates at -20 dBu; two further yellow LEDs illuminate when the input level is +4 dBu and +10 dBu respectively, with the **LEVEL** control set to zero. The meters are post the input level control [1], and therefore can be used when this is adjusted. However, they are pre the mute button [2], and thus will continue to indicate the presence of an input signal even when the mute is active. The meters possess PPM-style ballistics (fast attack, slow decay).
- ⑦ A separate red **Peak** LED indicates that the signal level is within 1 dB of clipping. The signal is monitored before the level control [1] as well as at the metering point.

### Output Controls:

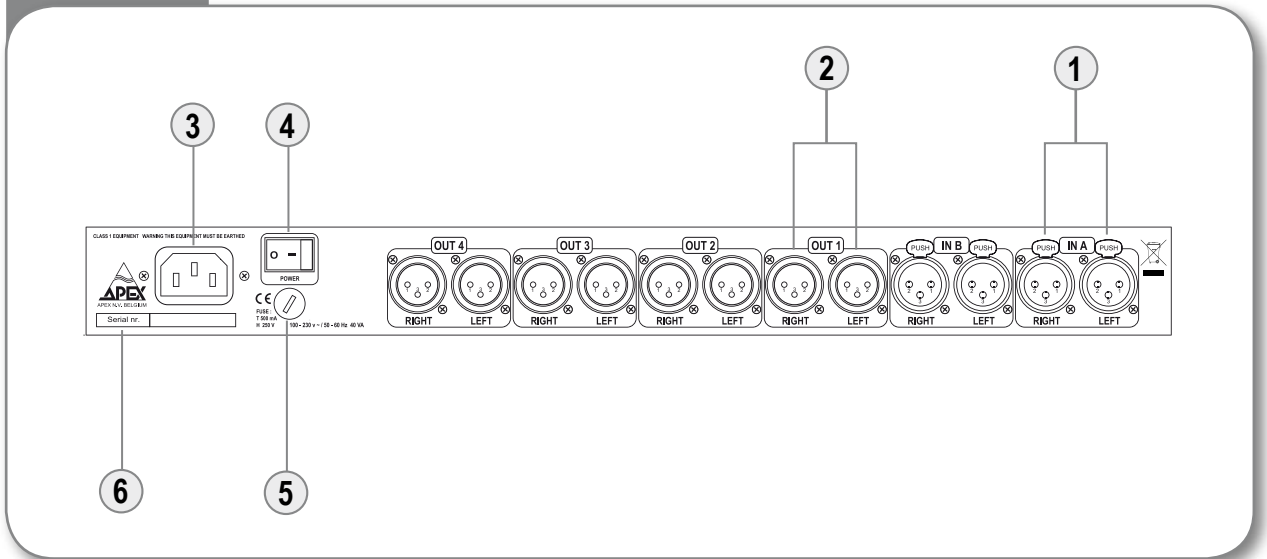
Front panel controls for **OUT 1** are described: those for **OUTS 2 to 4** are identical.

- ⑧ **OUT 1 MIX A** is a stereo control adjusting the level at which Input A signal is fed to Output 1. The range is from  $-\infty$  to +6 dB. The control is centre-detented at unity gain (0 dB).
- ⑨ **OUT 1 MIX B** has an identical function to [8] for Input B.
- ⑩ Pressing the latching **MUTE** button mutes Output 1 completely.
- ⑪ Red LED indicates Output Mute [10] is active.
- ⑫ The Left and Right channels of the Output may be summed with the **MONO** button. As with the input mono function, a 6 dB pad is inserted to maintain mono/stereo level compatibility.
- ⑬ Green LED indicates Output Mono [12] is active.
- ⑭ A set of meters is provided with characteristics identical to those of the input meters [6]. The output metering point is post both the Mix controls [8 & 9] and the Output Mute button [10].
- ⑮ A separate **Peak** LED indicates that the signal level is within 1 dB of clipping. The signal is monitored before the Mix controls [8 & 9] as well as at the metering point.

### Other front panel features:

- ⑯ A convenient set of scribble strips is provided for the user to note the various zone locations. These can also accept standard 6 mm or 9 mm width tape from Dymo®, Brady®, Brother®, etc. label printers.
- ⑰ The green **Power** LED illuminates when AC power is applied to the unit. The dBZ-48's power switch is on the unit's rear panel.
- ⑱ The dBZ-48 may be mounted in a standard 19" rack housing. Please observe the guidance regarding ventilation.

## Rear panel

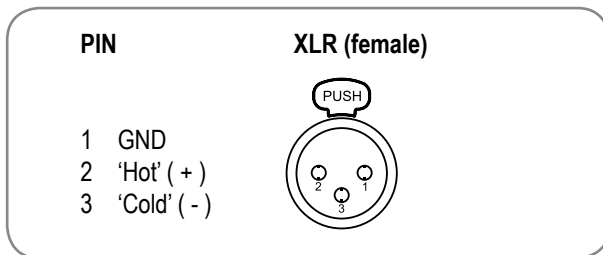


## Rear panel

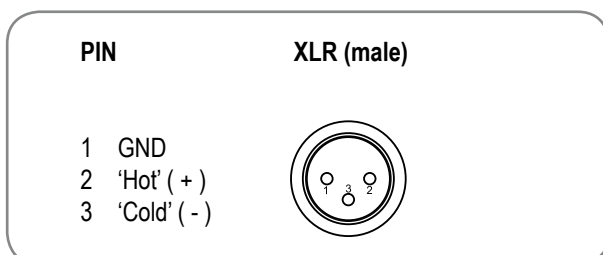
All connections to the dBZ-48 are made via the rear panel.

Rear panel connections for **IN A** are described: those for **IN B** are identical. Similarly, the details of the output connections are identical for all four channels.

① Input A L & R. Inputs are on latching 3-pin female XLRs, with separate connectors for left and right channels. The inputs are electronically balanced. The pinout is as shown below:



② Output 1 L & R. Outputs are on 3-pin male XLRs, with separate connectors for left and right channels. The outputs are electronically balanced. The pinout is as shown below:



③ IEC receptacle for AC mains.

④ A **POWER** switch of the 'rocker' type applies power to the unit.

⑤ Mains fuse holder. The fuse size is 20 x 5 mm, type T500mA (slo-blo). Only replace a fuse with one of an identical size, type and rating.

⑥ The unit's serial number can be found on the rear of the unit. Please record this number in the space provided on the first page of this manual.

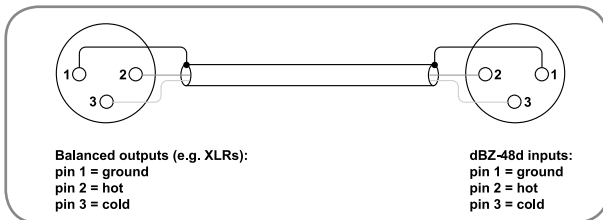
## Wiring the unit

The use of twin-and-screen cable is recommended for both inputs and outputs.

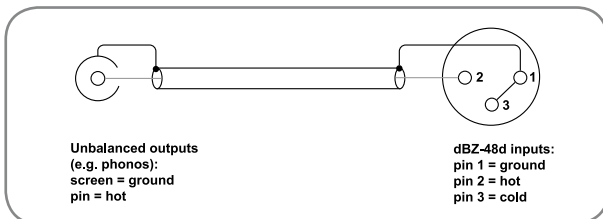
### Inputs

Preferred wiring for both balanced and unbalanced sources is illustrated below:

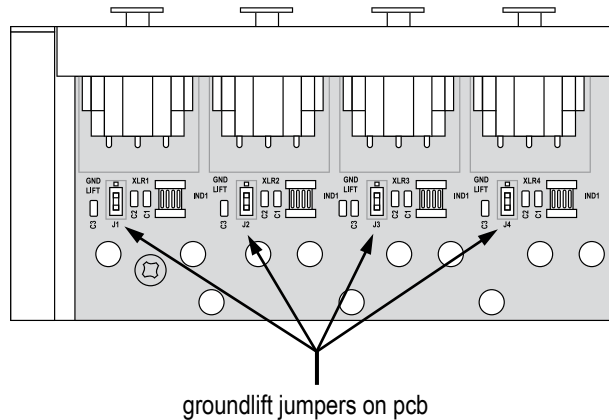
#### Balanced



#### Unbalanced



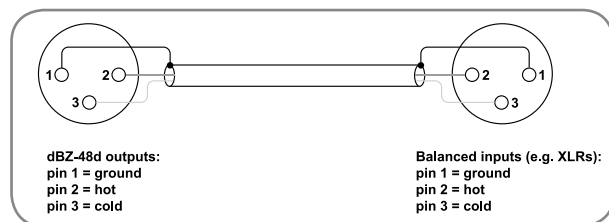
A 'ground lift' facility is available on the dBZ-48's inputs, which may be useful in resolving earth hum issues. Normally the input XLR's pin 1 is connected to ground, but this connection may be broken by moving an internal pcb jumper.



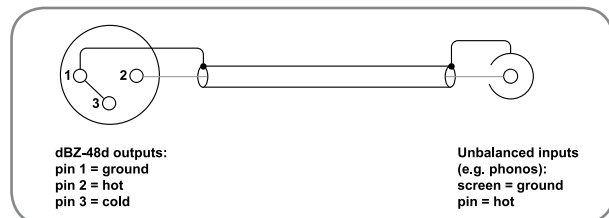
### Outputs

Preferred wiring for both balanced and unbalanced destinations is illustrated below:

#### Balanced



#### Unbalanced



## Overview

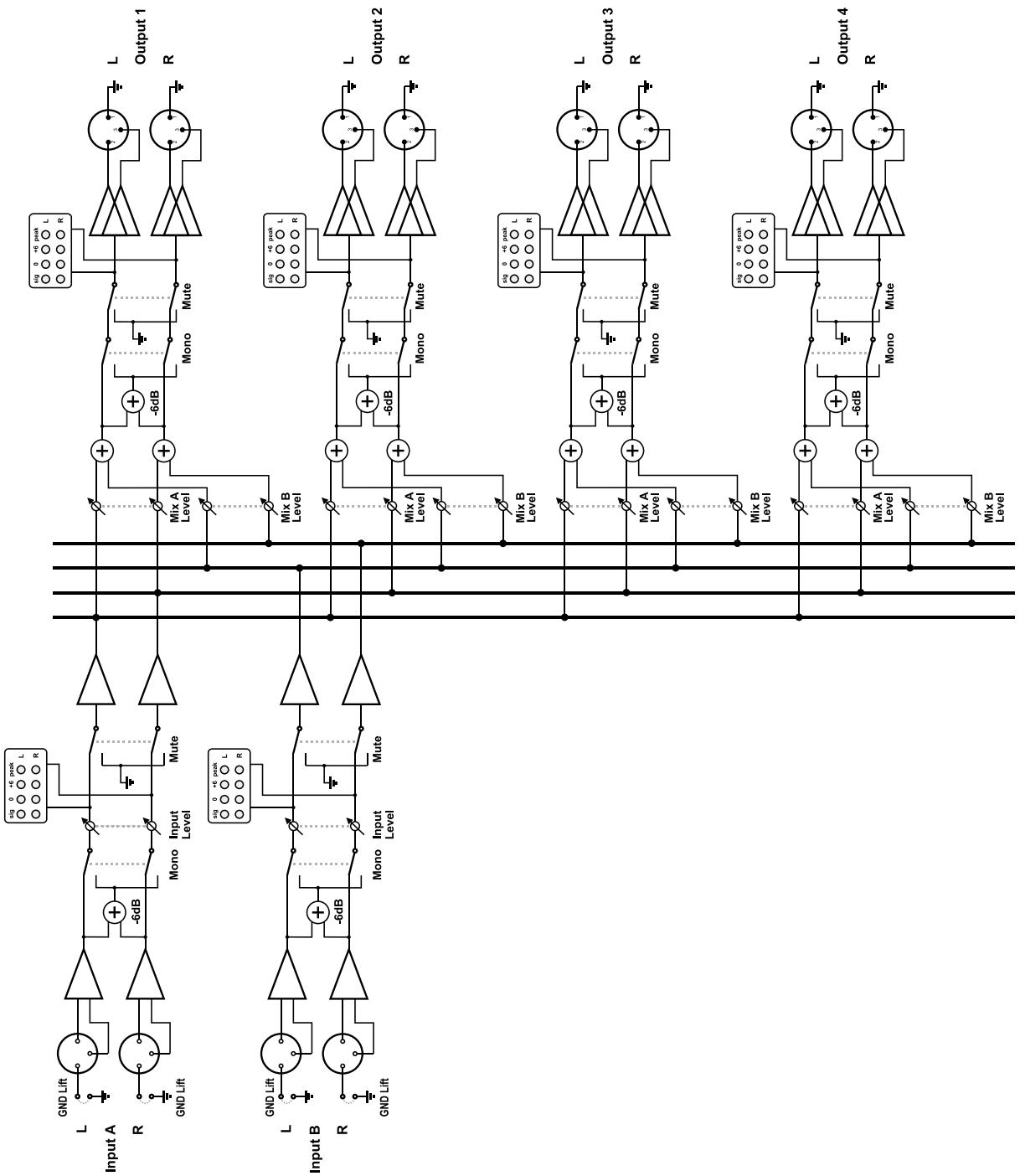
The Apex dBZ-48 can be used in any situation where one or two stereo audio signals need to be routed and mixed at different levels to up to four destinations.

Each of the two inputs is provided with electronic balancing, RFI filtering, mono/stereo switching, level control, a muting circuit and LED metering. The A & B inputs are each split to the four output channels, and summed separately in each.

The level of each input signal fed to each output channel may be individually set. Again, mono/stereo switching, muting and LED metering are available for each output. The servo-balanced

output stage design results in a very low output impedance, making it possible to drive long balanced lines (e.g., from a FOH mix position to stage amp racks).

# dBZ-48 Block diagram



### Using the dBZ-48

Operation of the dBZ-48's input and output sections is entirely straightforward, and requires only correct adjustment of the respective level controls.

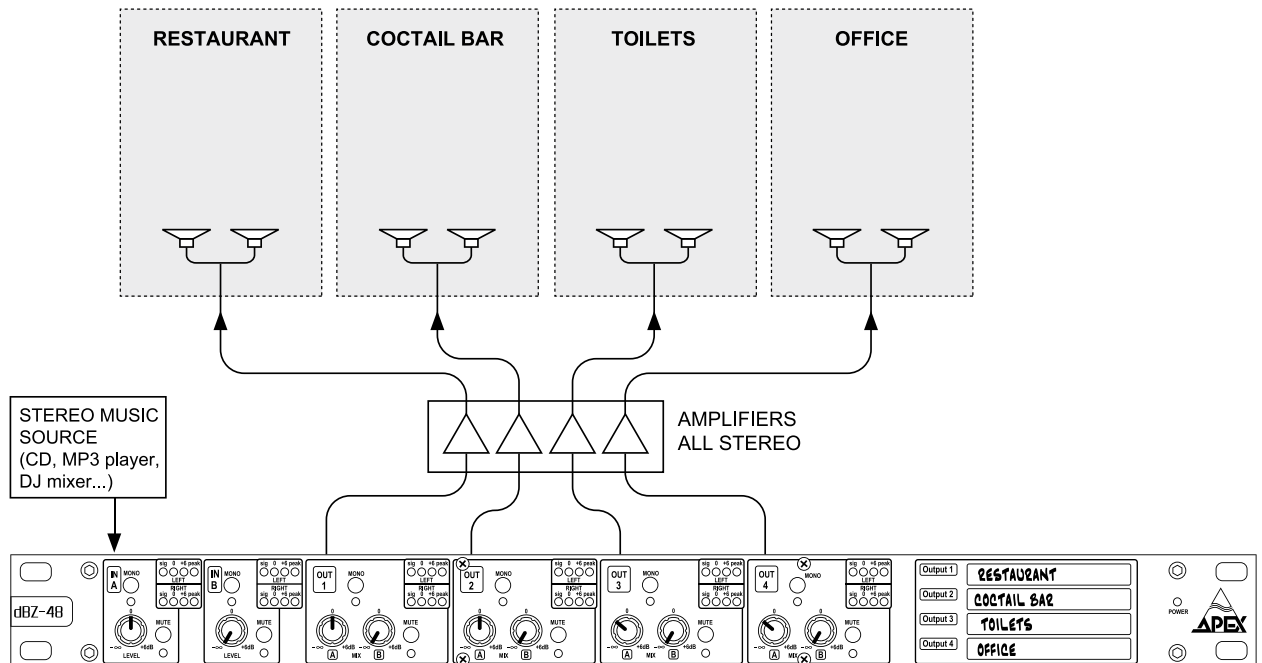
Start with all the front panel rotary controls fully anticlockwise. Connect the stereo input source(s) to IN A and IN B and the stereo outputs to their respective amplifiers (or other signal processing) as appropriate. With the programme material present, rotate the input level controls until the second (+6dB) LEDs flash on the loudest peaks, but so that the red peak LEDs do not illuminate. Then rotate the output level controls for each output channel in turn to obtain a similar display on each pair of output LED meters.

### Mono operation

The MONO buttons on the input channels should be used if the input in question is being fed from a mono source. In this case, the input signal may be applied to either the L or R input.

If any of the outputs are to be used in mono (e.g. with the dBZ-48 in use as a zoner, it may not be practical for some room areas to support effective stereo operation), the output channel MONO buttons may be used to make an L+R sum of the stereo input signals available at both L and R outputs of a channel. This does not compromise the other output channels being used as stereo, of course.

## Stereo music distribution



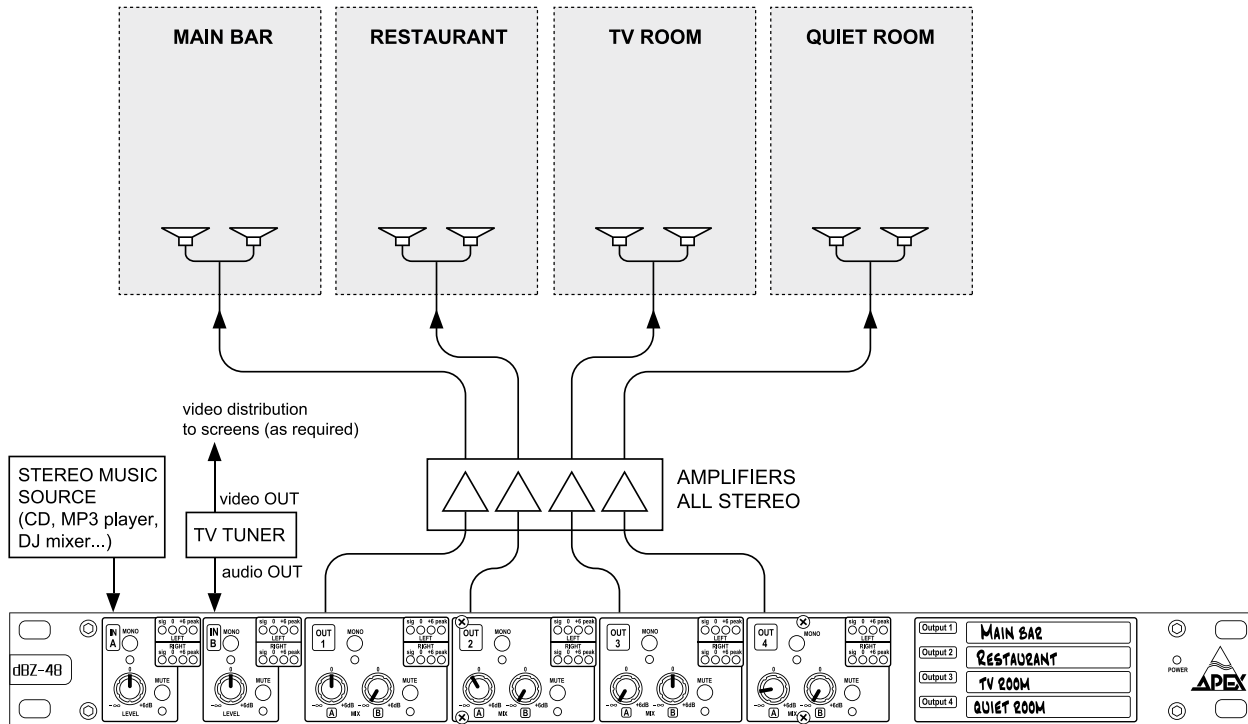
In this example, the dBZ-48 is used to feed 4 zones or areas of a building, typically an office, retail store, restaurant, coffee shop, or similar. The requirement is to have stereo music playing throughout the building, but at different sound levels in the various zones. The dBZ-48 is excellent for this application, as it provides simple central control of the level in each zone, as well as overall “master” level control.

The music source is connected to In A, and the four outputs to the stereo power amplifiers driving the speaker systems in each zone. If any zone(s) is more suitable for mono audio (see page 14), **Mono** may be selected on that output only without affecting any other zones.

**Out 1 Mix A**, **Out 2 Mix A**, **Out 3 Mix A** and **Out 4 Mix A** set the individual sound level in each zone, while **In A Level** acts as an overall level control for the whole system.

Note that **In B** is not used in this application, and all the **B** controls should be left at minimum.

## Bar/Pub with two music sources



Many venues have large-screen TVs installed in several areas, but often wish to only use those in certain areas, and play background music elsewhere. The arrangement shown in the first example above can be simply extended to accommodate this requirement.

In this example, the TV tuner or satellite receiver's audio output is connected to **In B** and the background music source to **In A**. Each of the four outputs feeds one of the venue's areas via a power amplifier. As in the first example, if any zone(s) is more suited to mono operation, that output's **Mono** button may be pressed.

The venue staff may select whether each of the areas receives TV sound or the background music, and set the level in each zone independently. **In A** is the "master" level control for the music and **In B** the "master" level control for the TV sound. The **Mix A** or **Mix B** level controls in each output section are used to determine whether that zone plays music or the TV sound, and at what level. If wished, a mix of the two sources (typically with the background music kept low) may be used in one or more zones.



## Electrical specifications

### Balanced line level input

Connectors	3-pin XLR
Impedance	> 10 k ohm, balanced
Max. input level	+21 dBu, balanced, 1 % THD+N
CMRR	> 60 dB, 1 kHz

### Balanced line level output

Connectors	3-pin XLR
Impedance	< 50 ohm, balanced
Max. output level	+ 26 dBu into 600 ohm, balanced, 1 % THD+N

### Audio performance (unity gain, all settings flat)

Frequency response	20 Hz - 20 kHz, +/- 0.5 dB
THD+N	less than 0,005 %, +4 dBu, 20 Hz - 20 kHz, 22 kHz BW
Dynamic range	> 110 dB, ref +26 dBu, 22 kHz BW, unweighted
Crosstalk	-80 dB, 20 Hz - 20 kHz, +4 dBu, channel-to-channel

### AC power requirements

Voltage	Auto-detect 100 - 240 V - 50/60 Hz
Power consumption	30 VA

## Environment

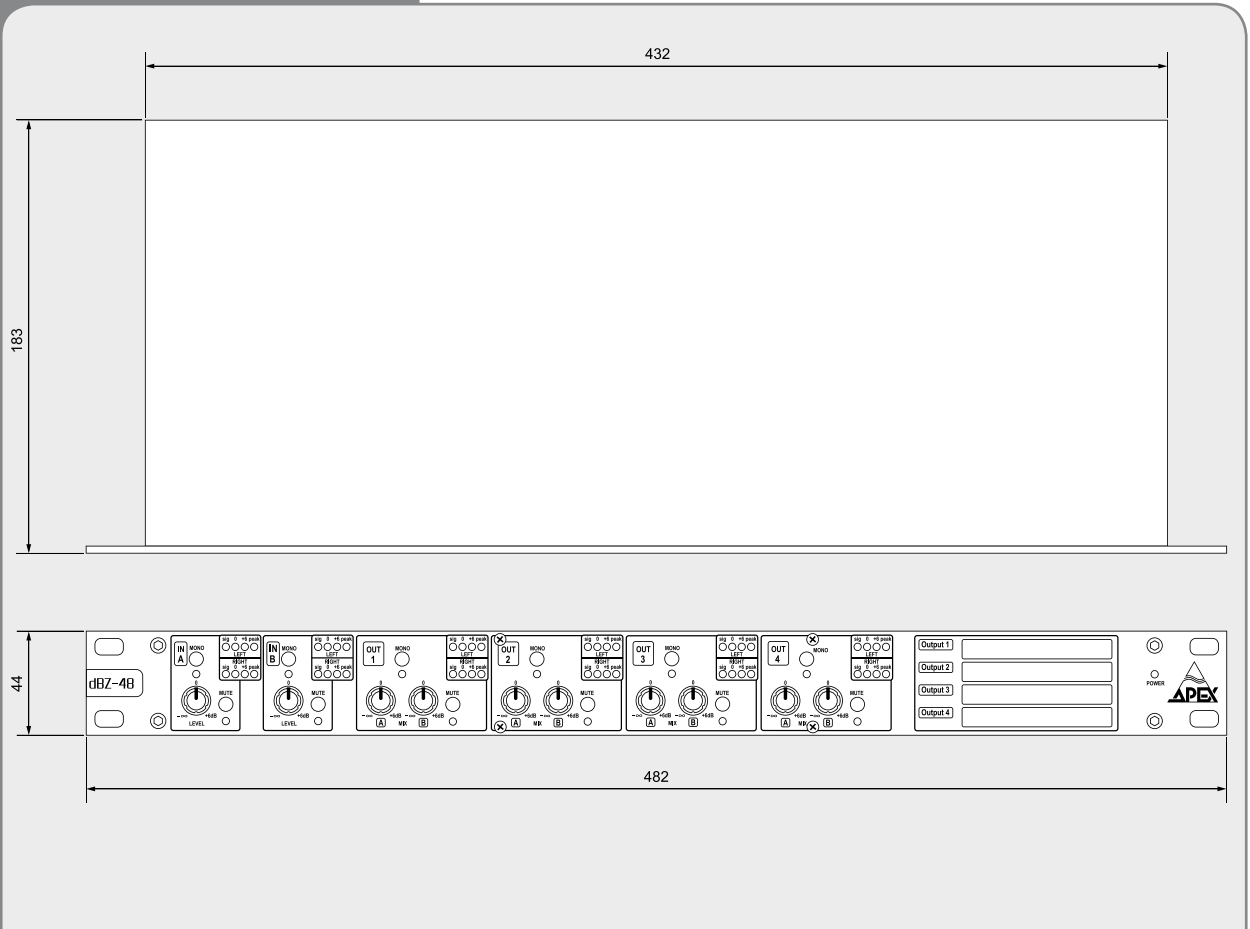
### Operating

Temperature	5° to 40° C
Relative humidity	up to 60 %

### Storage

Temperature	-20° to 60° C
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## Mechanical specifications



### Dimensions

Unit	Width	482 mm (19-inch)
	Height	44 mm (1U)
	Depth	183 mm

### Package

Width	530 mm
Height	115 mm
Depth	275 mm

### Weight

Unit (Nett)	2,5 kg
Unit + Package (Shipping)	3,7 kg

In the interest of product development, Apex reserve the right to modify or improve specifications of this product at any time, without prior notice and without any obligation to change or update equipment already delivered.

## Limited warranty

**Apex N.V.** ("Apex") warrants you, the original purchaser, or any party that purchases the device from you, that its products are free from defects in material and workmanship under normal use for a period of two (2) years from the date of original purchase. The date of purchase is the date which appears on the first invoice or any other proof of purchase provided by an Apex approved dealer.

Subject to the conditions and limitations set forth below, Apex will, at its discretion, either repair or replace any part of its products that prove to be defective, provided that the product is returned with proof of purchase, shipping prepaid, to an authorised Apex approved service facility.

Warranty cover of any repairs will only extend to the end of the original warranty period.

We will be happy to provide you with a list of authorised dealers to whom you can return the defective unit or who will give you a returns note to enable you to send the unit to the factory.

Service turn-around time will be as fast as reasonably possible. If you are not satisfied with the repair, contact Apex.

### Exclusions and limitations

This limited warranty covers only repair or replacement for defective products manufactured by Apex. Apex is not liable for, and does not cover under warranty, any loss of data or any costs associated with determining the source of system problems or removing, servicing or installing Apex products. This warranty excludes 3rd party software, connected equipment or stored data. Apex does not warrant that the operation of the product will be uninterrupted or error-free. In the event of a claim, Apex's sole obligation shall be replacement of the hardware.

This limited warranty does not cover:

- (1) any damage to this product that results from improper installation, accident, abuse, misuse, natural disaster, insufficient or excessive electrical supply, abnormal mechanical or environmental conditions or other external causes;
- (2) any damage caused by operating the product outside the permitted or intended uses described by Apex;
- (3) any damage caused by any unauthorized disassembly, repair, or modification;
- (4) consumable parts, such as batteries;
- (5) any cosmetic damage.

Apex is not liable for consequential damages.

This limited warranty also does not apply to any product on which the original identification information (including serial number) has been altered, obliterated or removed or any product that has not been handled or packaged correctly.

Warranty services will be furnished only if the product is accompanied by a copy of the original retail dealer's invoice.

Warranty claims other than those indicated above are expressly excluded.







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