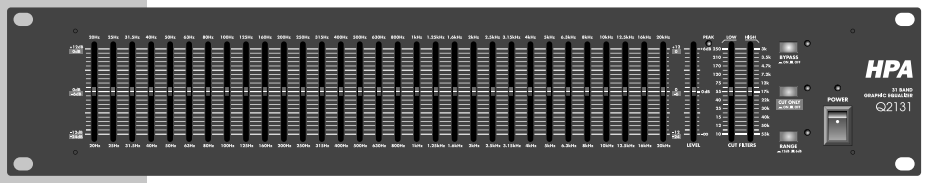
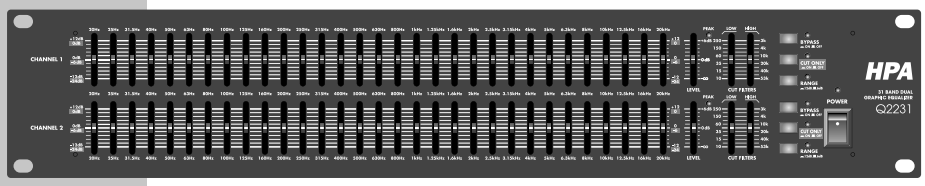
Owner's Manual

Q 2131



Q 2231



HPA

WARNING

1. Read these instructions - All the safety and operating instructions should be read before this product is operated.
2. Retain these instructions - The safety and operating instructions should be retained for future reference.
3. Heed all warnings - All warnings on the appliance and in the operating instructions should be adhered to.
4. Follow all instructions - All operating and use instructions should be followed.
5. Do not use this apparatus near water - The appliance should not be used near water or moisture - for example, in a wet basement or near a swimming pool, and the like.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacture's instructions.
8. Do not install near any heat sources such as radiators, heat registers,stoves,or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding plug. A polarized plug has two blades with one wider than the ther. A grounding 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.
10. Protect the power cord from being walked on or pinched particularly at the plugs, convenience receptacles, and at the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart or rack is used,use caution when moving the cart/apparatus combination to avoid injury from tip-over.

13. Unplug the apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified personnel. Servicing is required when the apparatus has been damaged in any way, such as power supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. Please keep the unit in a good ventilation environment.
16. WARNING:To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. The apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall not be placed on apparatus.
17. WARNING: The mains plug or appliance inlet is used as disconect device, the disconnect device shall remain readily operable.
18. Power Sources – This product should be operated only from the type of power source indicated on the rating label.If you are not sure of the type of power supply to your home, onsult your product dealer or local power company. For products intended to operate from battery power, or other sources, refer the perating instructions.
19. Safety Check – Upon completion of any service or repairs to this product, ask the service technician to perform safety checks to determine that the product is in proper operating condition.
20. Don't touch conductive parts of output terminals to prevent hazardous electrical shock. The external wiring connected to the terminals requires installation by an instructed person or the used of ready - made leads or cords.
21. This eguipment is for commercial & professional use only.
22. This product is in compliance with EU WEEE regulations. Disposal of end of life produc should not betreated as municipal waste. Please refer to your local regulations for instructions on proper disposal of this product.

23. To prevent hazardous electrical shock, do not touch the conductive parts of the output terminals.The external wiring connected to the terminals requires installation by an quallified technician or the use of ready made leads or cords.

Protective earthing terminal. The apparatus should be connected to a mains socket outlet with a protective earthing connection.

This lightning flash is intended to alert the user to the presence of non-insulated "dangerous voltage" on the output terminals that may be of sufficient magnitude to constitute a risk of electric shock.The external wiring connected to the terminals requires installation by an instructed person or the used of ready-made leads or cords.

CAUTION: To reduce the risk of electric shock, do not remove any cover. No user-serviceable parts inside. Refer servicing to qualified service personnel only.

The lightning flash with arrowhead symbol within the equilateral triangle is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of suf ficient magnitude to constitute a risk of electric shock.

The exclamation point within the equilateral triangle is intended to alert the user to the presence of important operation and maintenance (servicing) instructions in the literature accompanying this appliance.

CAUTION: To prevent electric shock, do not use this polarized plug with an extension cord, receptacle or other outlet unless the blades can be fully inserted to prevent blade exposure.

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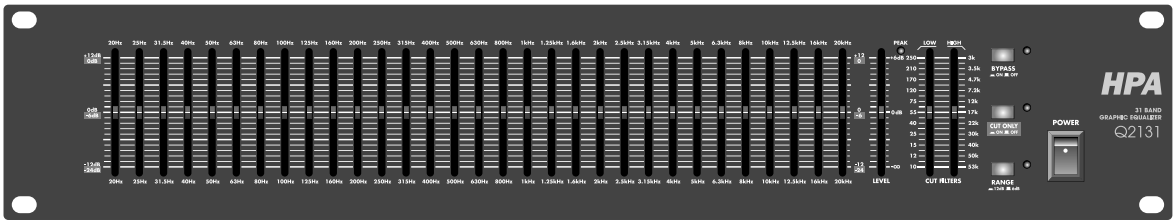
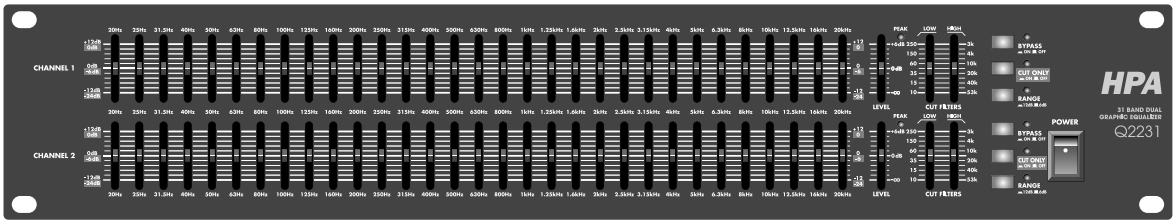
Introduction

Q 2131 / Q 2231





Welcome

Congratulation and thank you for the purchasing Q Series, a state-of-the-art Professional Graphic Equalizer.
These equalizer is a professional quality signal processor that gives you precise tonal control.
In this manual, you'll find a more detailed description of the features of Q2231/2131, as well as a guided tour through the front and rear panels, step-by-step instructions for using the unit.
We wish you great enjoyment and satisfaction when using your equalizer, whether you are an installation, or reinforcement engineer.

Unpacking and Installation

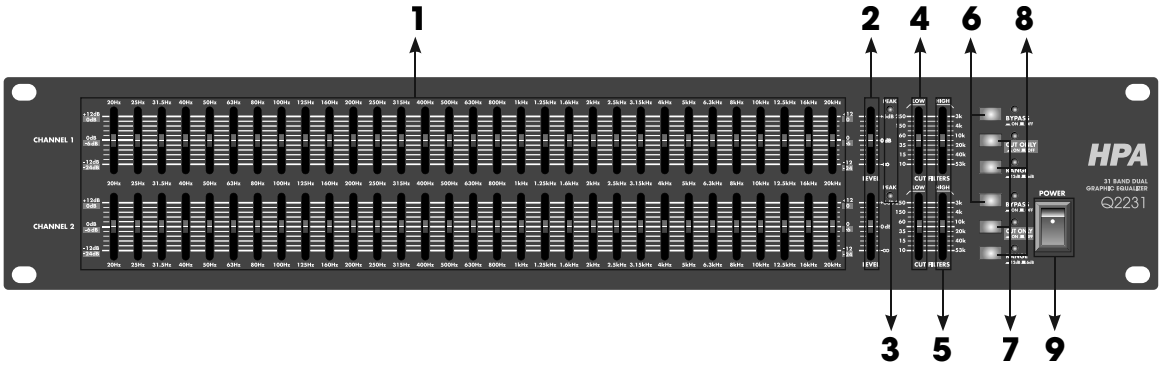
Although it is neither complicated to install nor difficult to operate your equalizer, a few minutes of your time is required to read this manual for a properly wired installation and becoming familiar with its features and how to use them. Please take a great care in unpacking your set and do not discard the carton and other packing materials. They may be needed when moving your set and are required if it ever becomes necessary to return your set for service. Never place the unit near radiator, in front of heating vents, to direct sun light, in excessive humid or dusty location to avoid damages and to guaranty a long reliable use. Connect your unit with the system components according to the description on the following pages.

Features

The Q2231 is a two channel equalizer (The Q2131 is a one channel) and each channel prvides 31 bands of equalization, with each frequency band representing1/3 of an octave in the 20Hz to 20KHz range.

* Equipped with an BYPASS switch that bypasses the equalizer section, a RANGE switch that changes the equalization range and CUT ONLY switch that attenuates 12 or 24dB.
* The active filter sections feature the Q2231/2131's innovative inter-polating constant-Q design.
* Constant-Q circuitry ensures that the bandwidth of the selected frequency area stays the same zeven when approaching maximum boost or attenuation.
* These equalizer can be set for 6 or 12dB of gain and attenuation for the frequency bands.
* These equalizer can be set for CUT ONLY mode providing up to 24dB attenuation with full slider range.
* Sweepable Low & High Cut Filter for each channel.
* Relay power on circuitry prevents speaker "thumps" when the unit is turned on.
* Electrically balanced XLR and TRS inputs and outputs connector.
* Main Level control enables output signal to be attenuated or boosted for optimum signal-to-noise ratio.
* Suitable for PA and recording applications and variety of other uses.
* Standard 19", 2 rack-space design for easyz intergration into any traveling or fixed installation audio system.
* 45mm Filter Slide Controls for Q2131.

Front Panel controls



1. Equalization controls.
These slide controls set the relative level of booster or cut at each 1/3-octave frequency location. The effect of each control is indicated by one of two calibration scales. The exact action of the Equalizer sliders depends upon the setting of the Range switch as well as the setting of the Cut Only switch
When the Cut Only switch is not pressed in : When an equalizer slider is at its center detented 0 position, the frequency area is unaffected. When moved all the way up (to the +12dB) position, the frequency area is boosted by 12dB (if the Range switch is pressed in). or 6dB (if the Range switch is not pressed in). When moved all the way down (to the -12dB position), the frequency area is attenuated by 12dB(if the Range switch is pressed in) or 6dB (if the Range switch is not pressed in).
When the Cut Only switch in pressed in : When the equalizer slider is its top-most position, the frequency area is unaffected (There is no boost or cut). As the Equalizer slider is moved down, the frequency area is attenuated.
When moved all the way down, the frequency area is attenuated by 12dB (if the Range switch is not pressed in) or 24dB (if the Range switch is pressed in).

2. Level control.
Sets the level of the signal coming into the Q2231/2131. Turn this control down if the PEAK LED lights up steadly (meaning too strong an Input signal). Since actual unity gain depends on varying slider settings(which is why we have not marked a unity gain position on the front panel), use the BYPASS switch to determine the exact unity gain position of this LEVEL control by comparing EQ and BYPASS loudness

3.PEAK Indicator.
This indicator glows or flashes red when the signal passing through the unit is 4dB of the maximum allowable level at some point in the circuitry.

4. Low Cut Filter control.
This control sets in a up direction to increase the frequency of the low filter cutoff. The calibrations on the front panel indicate the -3dB point of the filter. Setting this control to its full down position effectively bypass the filter.

5. High Cut Filter control.
This control sets in a up direction to increase the frequency of the high filter cutoff. Like the low cut filter, the calibration reflect the -3dB point of the filter. Maximum position effectively bypass the filter.

6. Bypass switch.
This switch determines whether the signal is routed through or bypasses the equalizer section. When this switch pressed in, the equalizer is bypassed and the settings of the equalizer controls are ineffective, providing a flat frequency response. When the switch not pressed in, the equalizer is switched into the audio path. The equalized signal can be compared with the un-equalized signal simply by alternately turning the Bypass switch on and off.

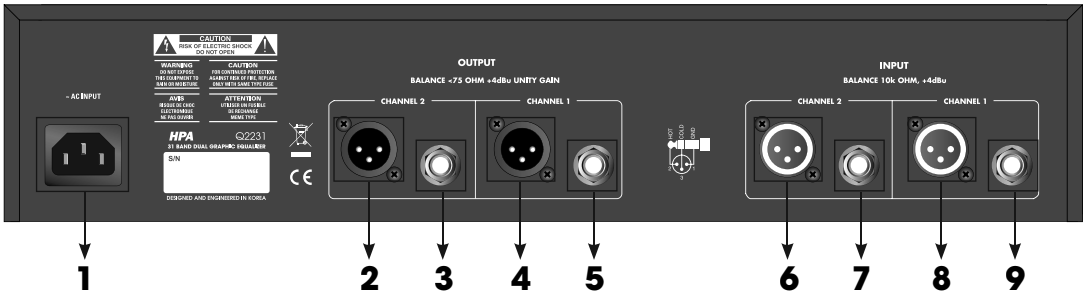
7. CUT ONLY switch.
When pressed in, the LED switch lights and all the Equalizer sliders serve to attenuate their frequency areas only by up to 12 or 24dB, depending upon the setting of the RANGE switch.
The CUT ONLY switch should be used when you need to notch out certain frequencies in order to reduce feedback or “ring out” a room.

8. RANGE switch.
Allows selection of the boost or cut range for equalization. When this switch pressed in, the maximum range of ±12dB is selected. When this switch not pressed in, the ±6dB range selected. Use this switch to select the range suitable for each application. When the switch pressed in, the LED indicator to its right lights to show that ±12dB range is in effect.

9. Power switch.
Use this to turn the power on and off.

10. Channel 2.
Same functions and controls and Channel 1.

Rear Panel controls



1. AC input
IEC connector for AC power cable. Connect the supplied 3-pin IEC power cable

2. CH2 Balanced XLR Jack output.
Electronically balanced XLR jack output, pin 2 is hot “+”, pin 3 is cold “-” and pin 1 is chassis ground.

3. CH2 Balanced 1/4” TRS Jack output.
Electronically balanced 1/4” TRS jack output, pin 2 is hot “+”, pin 3 is cold “-” and pin 1 is chassis ground.

4. CH1 Balanced XLR Jack output.
Electronically balanced XLR jack output, pin 2 is hot “+”, pin 3 is cold “-” and pin 1 is chassis ground.

5. CH1 Balanced 1/4” TRS Jack output.
Electronically balanced 1/4” TRS jack output, pin 2 is hot “+”, pin 3 is cold “-” and pin 1 is chassis ground

6. CH2 Balanced XLR Jack input.
Electronically balanced XLR jack input, pin 2 is hot “+”, pin 3 is cold “-” and pin 1 is chassis ground.

7. CH2 Balanced 1/4” TRS Jack input.
Electronically balanced 1/4” TRS jack input, pin 2 is hot”+”, pin 3 is cold”-“ and pin 1 is chassis ground.

8. CH1 Balanced XLR Jack input.
Electronically balanced XLR jack input, pin 2 is hot “+”, pin 3 is cold “-“ and pin 1 is chassis ground.

9. CH1 Balanced 1/4” TRS Jack input.
Electronically balanced 1/4” TRS jack input, pin 2 is hot”+”, pin 3 is cold”-“ and pin 1 is chassis ground.

SET UP

1. Remove all packing materials and decide where the unit is to be physically placed. Save packing material in case of need for future service. Q2131/2231 can be used free-standing or mounted in a 19” rack.

2. All mixers and amplifiers in your audio system turn off. The Bypass switch on front panel to it’s out position and set the Main Level sliders to it’s bottom setting.

3. Set all Equalizer sliders to center (“0”) position. These Equalizer can be used either as an “in-line” device, as an insert device.

4. Make these Equalizer output connection, using XLR or 1/4” TRS connectors on rear panel. If needed, connections can be made simultaneously to both.

5. Plug in AC connector and connect it to any standard AC socket.

6. Turn on Power switch. Note that audio signal will be muted for approximately five seconds until the relay power on circuitry is activated.

7. Apply input signal to these Equalizer. While the input signal is present, raise main level slider to it’s center position slowly. For best signal-to-noise ratio, the main slider should be near “0” point during normal operation. But if the input signal is weak, use the main level slider to boost the volume. If the signal causes the front panel peak LED to light, use the main level slider to attenuate volume as necessary.

8. Carefully listening to the audible result on the audio signal by moving each of the Equalizer sliders up and down. The very lowest and highest frequency areas may have little or no effect on some signal. If there is significant low rumble in the signal, adjust the LOW CUT filter slider. Starting with the LOW CUT slider minimum, adjust the slider so that the rumble is eliminated but the bass content of the signal still remains. Press the front panel Bypass switch in and out from time to time in order to compare the effect of the equalization curve you are creating with the original input signal.

Constant-Q

Traditional equalizer designs present a problem in that the filter's level control is actually a part of filter. Consequently, whenever the slider is moved, the bandwidth changes. The output exhibits the desired bandwidth only at full boost or cut. It degrades to as much as two octave at moderate slider settings. Responding to this dilemma, we applied a topology ensuring constant filter bandwidth ("Q") at all slider positions. Another important advantage of constant bandwidth is reduction of adjacent filter overlap. Conventional designs exhibit excessive overlap at moderate slider setting. Adjusting one slider affects the adjacent neighbors, requiring readjustments to each. Filter overlap in these equalizer is dramatically less, reducing the need for constant readjustment sliders. This means more effective equalization in significantly less.

Acoustic Compensation

A graphic equalizer may be used to correct many acoustic problem. However, one should fully understand the ramification of doing so. Acoustic problems are generally not consistent across the entire area of sound coverage. This is much more of a problem when setting up a sound system for large veues. In a typical large room or hall, there will be areas that have acoustic reinforcement problems and other areas where certain frequencies are almost entirely canceled out. Try to seek an acoustic remedy for acoustic problems whenever possible. When this is not possible or feasible, an equalizer may be used to compensate for an acoustic problem. But the problem is only improved at the point where the meaurement is taken, other locations in the room may be adversely affected by the equalizer setting. For this reason, measure the acoustic response of the system from several locations and average the equalizer's setting. Doing this helps most locations in the venue to have an equal sound quality. The best way to see what the acoustic signature of the room is doing to sound is to use a real time analyzer or any of the many computerized measurement systems. Using these devices to analyze the response of the room and the sound system is the only accurate means available for setting an equalizer properly. Equalization can be like spice in the hands of a master chef. A little goes a long way in improving sound quality, too much and the mix is spoiled. If modest amounts of equalization do not solve the problem, it is best remedied by other means. Avoid adding large amounts of boost below 63Hz, especially when using vented bass cabinets. Boosting frequencies below the vented enclosure's low frequency cutoff can easily cause over excursion of the speakers cone, causing premature failure. In addition, boosting low frequencies can make your power amplifier run hotter, leading to premature amplifier failure. When equalizer adjustment is complete, compare the un-equalized sound with the equalized sound by alternately engaging Bypass switch.

Feedback Margins

Depending on the room characteristics feedback can be result in howling or ringing being generated at specific frequencies. In such cases the equalizer can be used to reduce levels at the affected frequencies and thereby to control the feedback, but a pink noise generator and a spectrum analyzer are again required. Set the equipment up just as for an actual performance, and connect the pink noise generator to a spare input connector of mixing console and the spectrum analyzer to a spare output connector. After ensuring that pink noise is being properly radiated from all PA speakers and monitor speakers, gradually raise the output level until it is evident at which frequencies feedback will occur. Use Q2131/2231 to reduce the levels of these specific frequencies. Proper adjustment will provide a safety margin against feedback when the output level is raised.

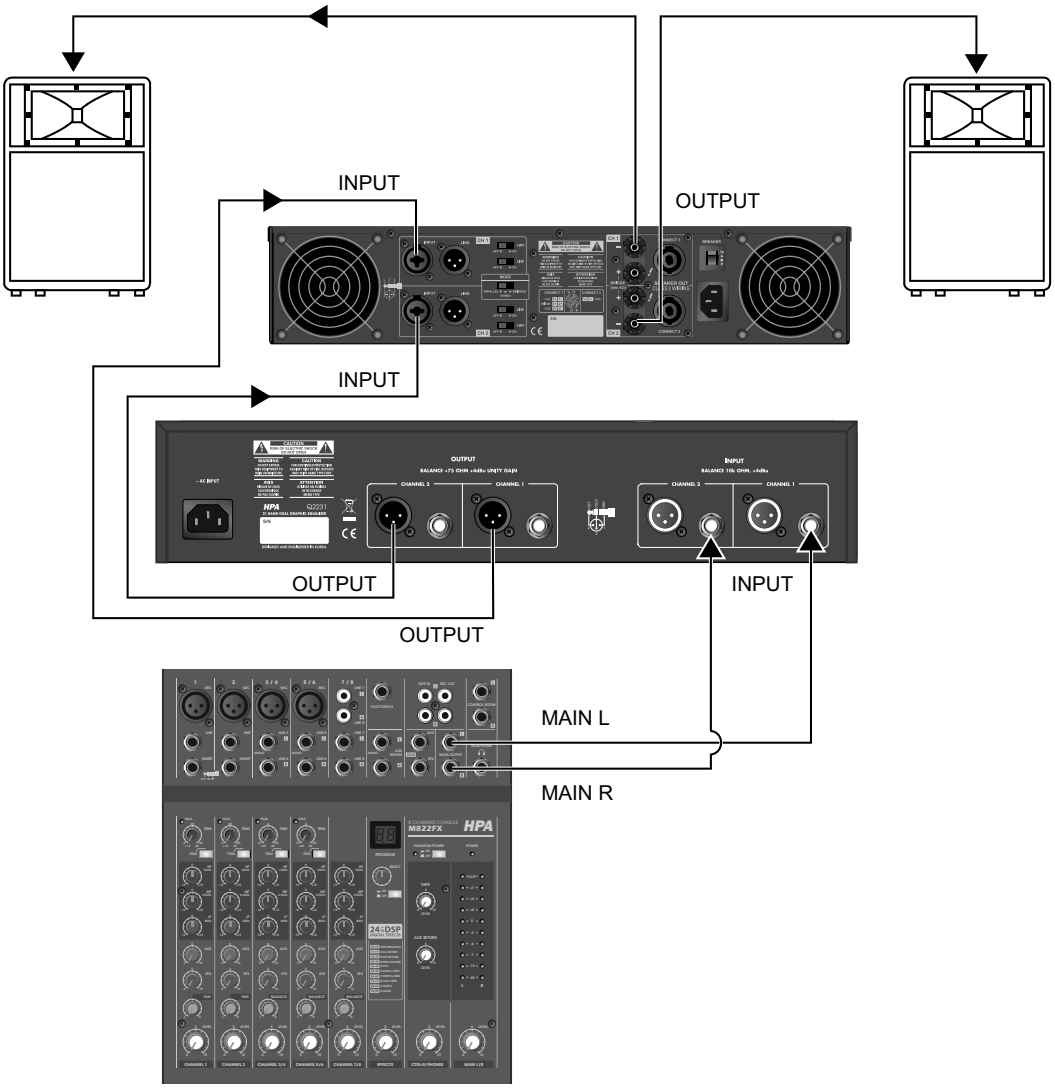
Grounding

Hun and buzz are the biggest enemies you face when interconnecting a large number of different pieces of equipment to one another. This is because each piece of equipment may operate at a marginally different voltage and, when two devices at slightly different potential are physically connected with audio cabling, the end result can be nasty. If after hooking up your system it exhibits excessive hum or buzzing, there is an incompatibility in the grounding configuration between units somewhere. Your mission, should you accept it, is to discover how your particular system wants to be grounded. Here are some things to try.

1. Try combinations of lifting grounds on units that are supplied with ground lift switches or links.
2. If your equipment is in rack, verify that all chassis are tied to a good earth ground, ether through the line cord grounding pin or the rack screws to another grounded chassis.
3. Units with outboard power supplies do not ground the chassis through their line cord. Make sure these units are grounded either to another chassis which is earth grounded, or directly to the grounding screw on an AC outlet cover by means of a wire connected to a screw on the chassis with a star washer to guarantee proper contact.

Q curve 2131 / 2231 System Configurations

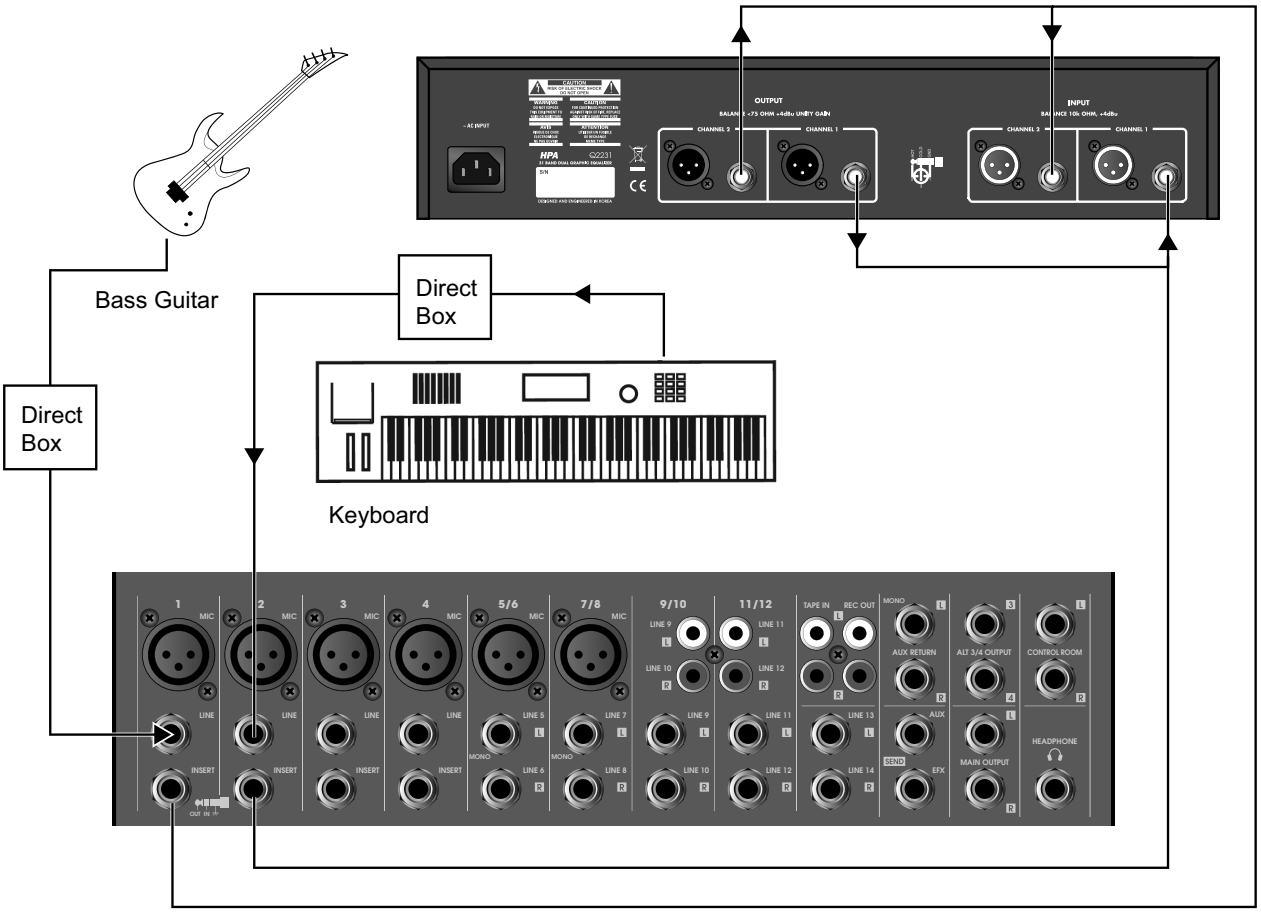
Using the Q2231 with Passive Speakers



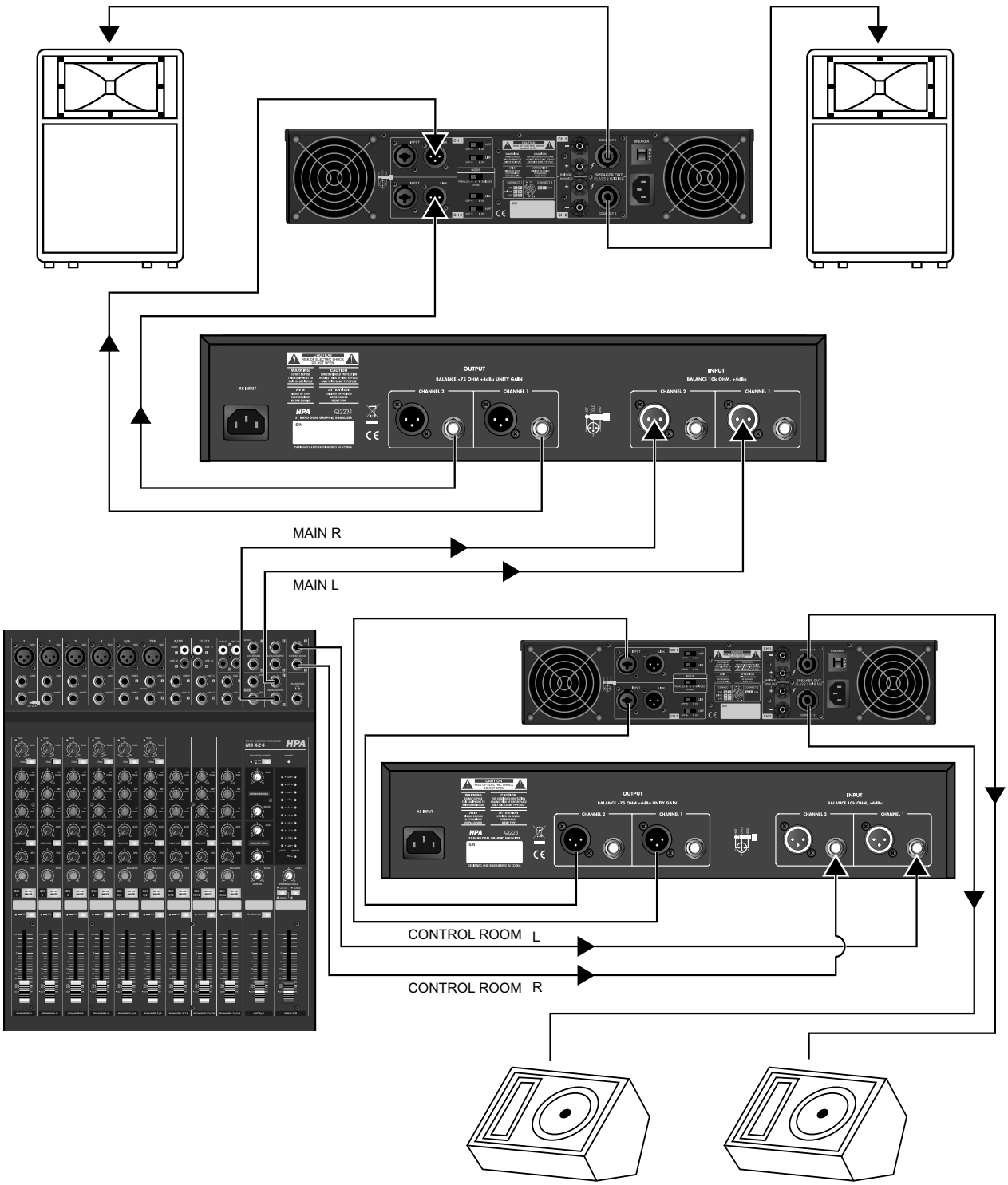
In this example the mixer's stereo output is connected to the Q2231's inputs, Then, the Q2231's outputs are connected to the input of a 2-channel power amp.Next,the power amplifier's outputs are connected to the passive (non-powered) loudspeakers.

Using the Q2231 in Insert Points

(See page12 to view insert cabel wiring guide)



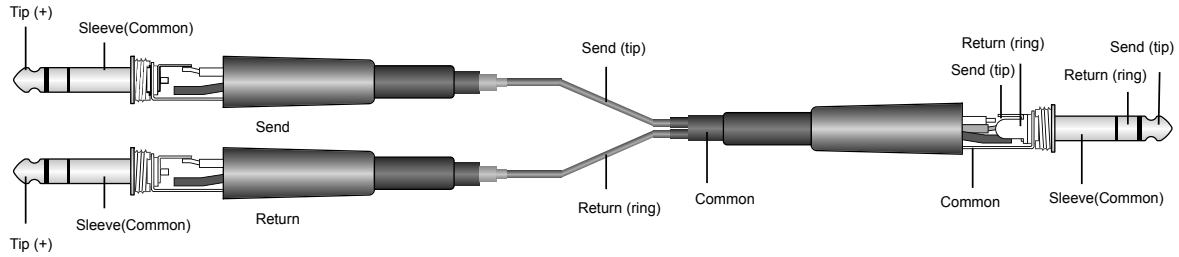
Using TWO Q2231 for Mains and Monitors



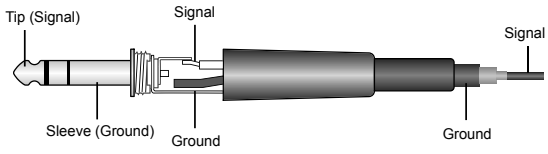
Q2131 and Q2231 Wiring Guide

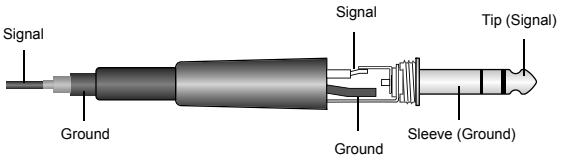
There are several ways to interface the Q2131 and Q2231, dependin on your exact monitoring set-up. Follow the cable diagrams below for connecting your monitor system.

1/4" TRS Insert Cable

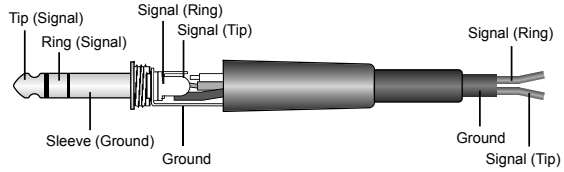


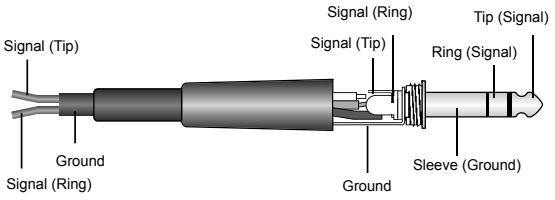
UN-Balanced 1/4" to 1/4" Cable



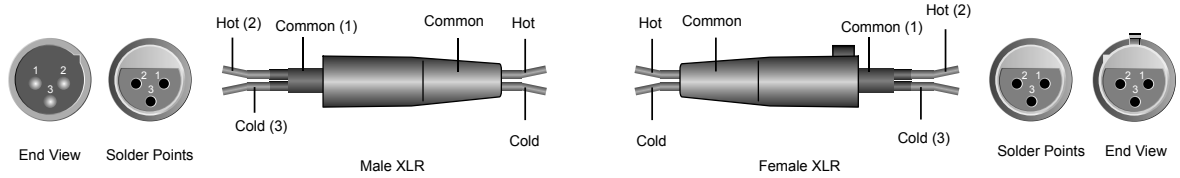


Balanced 1/4" to 1/4" Cable

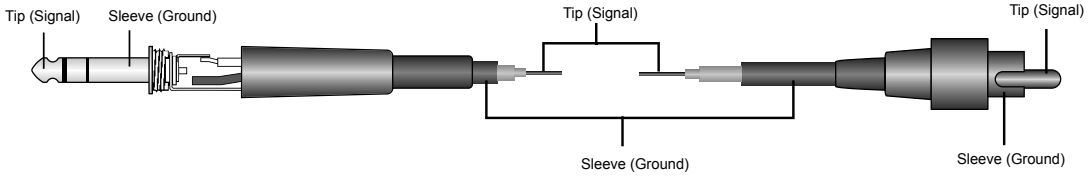




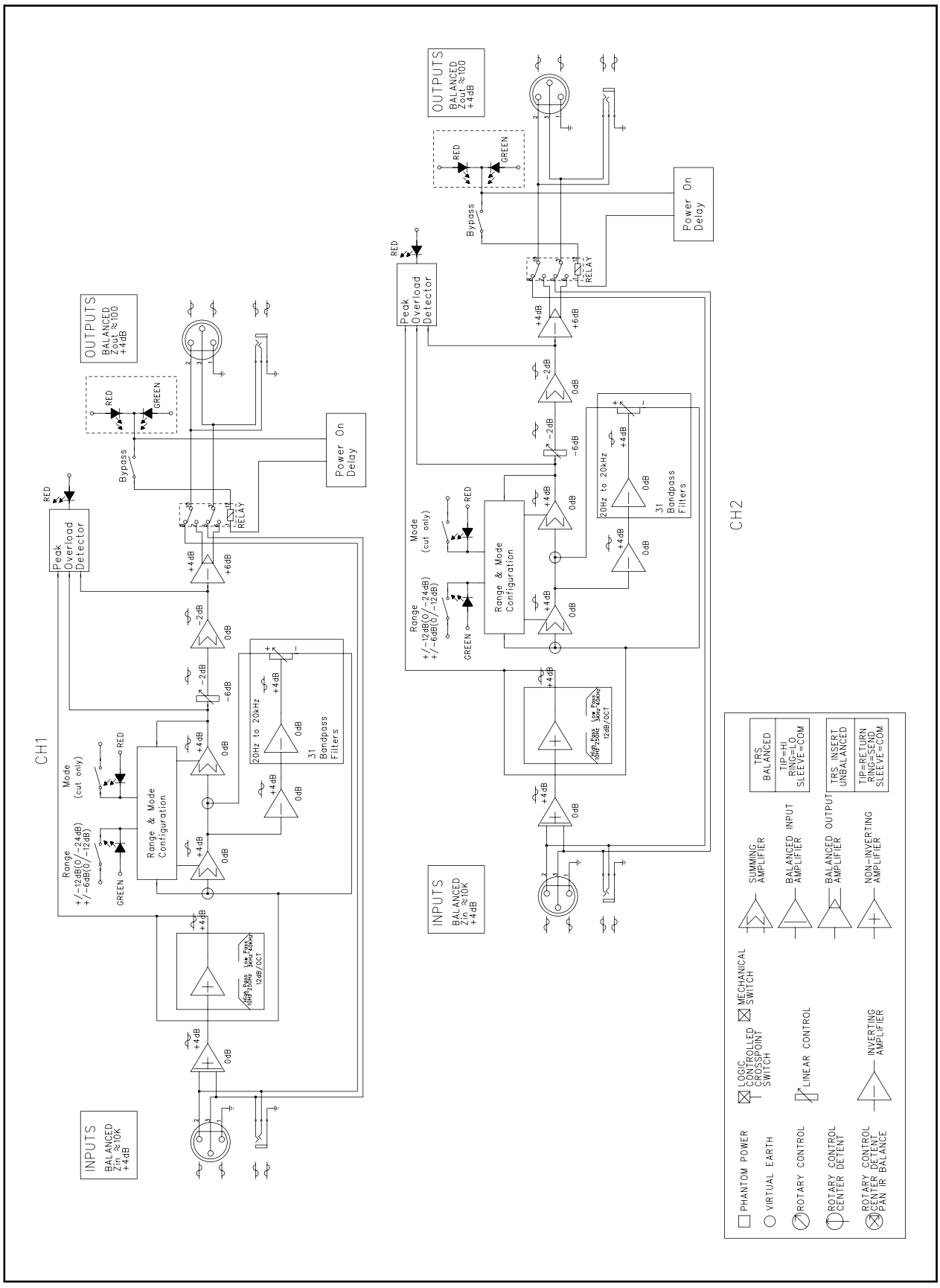
Balanced XLR to XLR Cable



Unbalanced 1/4" to RCA Cable



Block diagrams



Specifications

0dB=0.775Vrms, 0dBV=1Vrms

	Q2131	Q2231
T.H.D	Less than 0.01% (THD+N) 20Hz ~ 20kHz @+4dB 10kΩEqualizer..all flat(0dB)	
Frequency Response	20Hz ~ 20kHz, ± 1dB @ +4dB10kΩ	
Hum and Noise (Average, Rs=600Ω) BPF: 20Hz ~ 20kHz	-85dB * All EQ VR Flat, Master VR Center High& Low Cut Filters: min	
Maximum Voltage Gain	+6dB	
EQUALIZER CONTROLSCenter Frequencies	31band (1/3 octave)20, 25, 31.5, 40, 50, 63, 80, 100,125, 160, 200, 250, 315, 400, 500, 630, 800Hz1K, 1.25K, 1.6K, 2K, 2.5K, 3.15K, 4K, 5K, 6.3K, 8K, 10K, 12.5K, 16K, 20KHz	
Variable Range	±12dB/ ±6dB	
Cut Only Range	-24dB/ -12dB	
High Pass Filter	12dB/ octave 10Hz ~ 250Hz at -3dB point	
Low Pass Filter	12dB/ octave 3KHz ~ 53KHz at -3dB point	
Peak Indicator	Red LED on each channel turns on when post-EQ signal reaches the level 5dB below clipping.	
Power Source	AC 120V/230V/240V, 50/60Hz	
Power Consumption	16W	27W
Weight	4.5kg	5kg
Dimensions(W x H x D)	482mm x 88mm x 280mm	

-INPUT

Input Connectors	Input Imped-ance	Source Impedance	Input Level			Connectors Type
			Sensitivity	Nominal level	Maximum Before Clipping	
Input(CH1, CH2)	10kΩ	600ΩLines	+4dB(1.23V)	+4dB(1.23V)	+24dB(12.3V)	XLR 3-31 Type Phone Jack (TRS)

-OUTPUT

Output Connectors	Output Impedance	Load Impedance	Output Level		Connectors Type
			Nominal level	MaximumBefore Clipping	
Output(CH1, CH2)	150Ω	600ΩLines	+4dB(1.23V)	+24dB(12.3V)	XLR 3-31 Type Phone Jack (TRS)

Specifications and design subject to change without notice for improvements.

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