dbx® by HARMAN

iEQ

Dual Channel Digital Graphic EQ/Limiter w/Type V™ NR and AFS™

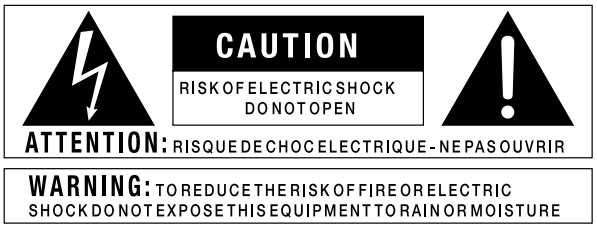


iEQ-15
iEQ-31

User Manual

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IMPORTANT SAFETY INSTRUCTIONS



The symbols shown above are internationally accepted symbols that warn of potential hazards with electrical products. The lightning flash with arrowpoint in an equilateral triangle means that there are dangerous voltages present within the unit. The exclamation point in an equilateral triangle indicates that it is necessary for the user to refer to the owner's manual.

These symbols warn that there are no user serviceable parts inside the unit. Do not open the unit. Do not attempt to service the unit yourself. Refer all servicing to qualified personnel. Opening the chassis for any reason will void the manufacturer's warranty. Do not get the unit wet. If liquid is spilled on the unit, shut it off immediately and take it to a dealer for service. Disconnect the unit during storms to prevent damage.

SAFETY INSTRUCTIONS

NOTICE FOR CUSTOMERS IF YOUR UNIT IS EQUIPPED WITH A POWER CORD.

WARNING: THIS APPLIANCE SHALL BE CONNECTED TO A MAINS SOCKET OUTLET WITH A PROTECTIVE EARTHING CONNECTION.

THE CORES IN THE MAINS LEAD ARE COLOURED IN ACCORDANCE WITH THE FOLLOWING CODE:

GREEN AND YELLOW - EARTH **BLUE - NEUTRAL** **BROWN - LIVE**

AS COLOURS OF THE CORES IN THE MAINS LEAD OF THIS APPLIANCE MAY NOT CORRESPOND WITH THE COLOURED MARKINGS IDENTIFYING THE TERMINALS IN YOUR PLUG, PROCEED AS FOLLOWS:

- THE CORE WHICH IS COLOURED GREEN AND YELLOW MUST BE CONNECTED TO THE TERMINAL IN THE PLUG MARKED WITH THE LETTER E, OR WITH THE EARTH SYMBOL, OR COLOURED GREEN, OR GREEN AND YELLOW.
- THE CORE WHICH IS COLOURED BLUE MUST BE CONNECTED TO THE TERMINAL MARKED N OR COLOURED BLACK.
- THE CORE WHICH IS COLOURED BROWN MUST BE CONNECTED TO THE TERMINAL MARKED L OR COLOURED RED.

THIS EQUIPMENT MAY REQUIRE THE USE OF A DIFFERENT LINE CORD, ATTACHMENT PLUG, OR BOTH, DEPENDING ON THE AVAILABLE POWER SOURCE AT INSTALLATION. IF THE ATTACHMENT PLUG NEEDS TO BE CHANGED, REFER SERVICING TO QUALIFIED SERVICE PERSONNEL WHO SHOULD REFER TO THE TABLE BELOW. THE GREEN/YELLOW WIRE SHALL BE CONNECTED DIRECTLY TO THE UNITS CHASSIS.

CONDUCTOR		WIRE COLOR	
		Normal	Alt
L	LIVE	BROWN	BLACK
N	NEUTRAL	BLUE	WHITE
E	EARTH GND	GREEN/YEL	GREEN

WARNING: IF THE GROUND IS DEFEATED, CERTAIN FAULT CONDITIONS IN THE UNIT OR IN THE SYSTEM TO WHICH IT IS CONNECTED CAN RESULT IN FULL LINE VOLTAGE BETWEEN CHASSIS AND EARTH GROUND. SEVERE INJURY OR DEATH CAN THEN RESULT IF THE CHASSIS AND EARTH GROUND ARE TOUCHED SIMULTANEOUSLY.

WARNING FOR YOUR PROTECTION READ THE FOLLOWING:

KEEP THESE INSTRUCTIONS

HEED ALL WARNINGS

FOLLOW ALL INSTRUCTIONS

the apparatus shall not be exposed to dripping or splashing liquid and no object filled with liquid, such as vases, shall be placed on the apparatus.

CLEAN ONLY WITH A DRY CLOTH.

DO NOT BLOCK ANY OF THE VENTILATION OPENINGS. INSTALL IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS.

DO NOT INSTALL NEAR ANY HEAT SOURCES SUCH AS RADIATORS, HEAT REGISTERS, STOVES, OR OTHER APPARATUS (INCLUDING AMPLIFIERS) THAT PRODUCE HEAT.

ONLY USE ATTACHMENTS/ACCESSORIES SPECIFIED BY THE MANUFACTURER.

UNPLUG THIS APPARATUS DURING LIGHTNING STORMS OR WHEN UNUSED FOR LONG PERIODS OF TIME.

Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized 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 third prong are provided for your safety. If the provided plug does not fit your outlet, consult an electrician for replacement of the obsolete outlet.

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

Use only with the cart stand, tripod bracket, or table specified by the manufacture, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.



Refer all servicing to to qualified service 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, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

POWER ON/OFF SWITCH: The Power switch used in this piece of equipment DOES NOT break the connection from the mains.

MAINS DISCONNECT: The plug shall remain readily operable. For rack-mount or installation where plug is not accessible, an all-pole mains switch with a contact separation of at least 3 mm in each pole shall be incorporated into the electrical installation of the rack or building.

If connected to 240V supply, a suitable CSA/UL certified power cord shall be used for this supply.

This Equipment is intended for rack mount use only.

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IMPORTANT SAFETY INSTRUCTIONS

ELECTROMAGNETIC COMPATIBILITY

This device complies with part 15 of the FCC Rules and the Product Specifications noted on the **Declaration of Conformity**. Operation is subject to the following two conditions:

- this device may not cause harmful interference, and
- this device must accept any interference received, including interference that may cause undesired operation.

Operation of this unit within significant electromagnetic fields should be avoided.

- use only shielded interconnecting cables.

U.K. MAINS PLUG WARNING

A molded mains plug that has been cut off from the cord is unsafe. Discard the mains plug at a suitable disposal facility.

NEVER UNDER ANY CIRCUMSTANCES SHOULD YOU INSERT A DAMAGED OR CUT MAINS PLUG INTO A 13 AMP POWER SOCKET.

Do not use the mains plug without the fuse cover in place. Replacement fuse covers can be obtained from your local retailer. Replacement fuses are 13 amps and MUST be ASTA approved to BS1362.



If you want to dispose this product, do not mix it with general household waste. There is a separate collection system for used electronic products in accordance with legislation that requires proper treatment, recovery and recycling.

Private household in the 25 member states of the EU, in Switzerland and Norway may return their used electronic products free of charge to designated collection facilities or to a retailer (if you purchase a similar new one).

For Countries not mentioned above, please contact your local authorities for a correct method of disposal.

By doing so you will ensure that your disposed product undergoes the necessary treatment, recovery and recycling and thus prevent potential negative effects on the environment and human health.

DECLARATION OF CONFORMITY

Manufacturer's Name: dbx Professional Products
Manufacturer's Address: 8760 S. Sandy Parkway
Sandy, Utah 84070, USA

declares that the product:

Product name: dbx IEQ15 and IEQ31
Note: Product name may be suffixed by the EU.

Product option: None

conforms to the following Product Specifications:

Safety: IEC 60065 -01+Amd 1

EMC: EN 55022:2006
EN 55024:1998
FCC Part 15

Supplementary Information:

The product herewith complies with the requirements of the:
Low Voltage Directive 2006/95/EC
EMC Directive 2004/108/EC.
RoHS Directive 2002/95/EC
WEEE Directive 2002/96/EC

With regard to Directive 2005/32/EC and EC Regulation 1275/2008 of 17 December 2008, this product is designed, produced, and classified as Professional Audio Equipment and thus is exempt from this Directive.

Roger Johnsen
Director, Engineering
Signal Processing
8760 S. Sandy Parkway
Sandy, Utah 84070, USA
Date: May 31, 2012

European Contact: Your local dbx Sales and Service Office or

Harman Signal Processing
8760 South Sandy Parkway
Sandy, Utah
84070 USA
Ph: (801) 566-8800
Fax: (801) 568-7583

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iEQ USER MANUAL



dbx® by HARMAN

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Congratulations on your purchase of the dbx iEQ Series Graphic Equalizer/Limiter with Type V™ Noise Reduction and AFS™. With an EQ heritage that has produced countless industry standard patents and dates back more than 30 years, the dbx iEQ-15 and iEQ-31 easily live up to the dbx legacy of uncompromised sonic integrity. In addition to unsurpassed equalization specs, the iEQ series also offer built-in necessities which include: AFS™ feedback suppression for effortless feedback control, Type V™ noise reduction for ultra low noise EQ operation, and PeakStopPlus® limiting for loudspeaker protection. The iEQ-15 is a 2 channel, 2/3 octave EQ, providing 15 bands of EQ per channel. The iEQ-31 is a 2 channel, 1/3 octave EQ, providing 31 bands of EQ per channel. The iEQ-15 and iEQ-31 also offer ±12 dB input gain range, switchable ±6 or ±15dB boost/cut range, 40mm faders, XLR, 1/4" and Euroblock inputs and outputs, nonconductive nylon sliders, and an intuitive user interface with comprehensive output and gain reduction metering. As always, the inevitable result of our meticulous attention to detail and top-quality componentry is exceptional sound, performance, and reliability.

This manual will be your guide to understanding the full functionality of the powerful iEQ Series processors. After you have become familiar with the unit, we encourage you to experiment and find creative ways that the iEQ can help you optimize your specific application.

Defining the iEQ

The dbx iEQ Series Graphic Equalizers provide the following features:

- ***Advanced Feedback Suppression (AFS™)***
- ***Type V™ Noise Reduction***
- ***PeakStopPlus® Limiting***
- ***1/3 & 2/3-Octave Constant Q Frequency Bands***
- ***Switchable Boost/Cut Ranges of ±6 or ±15dB***
- ***18dB per Octave 40Hz Low Cut Filter***
- ***±12dB Input Gain Range***
- ***XLR, TRS, and Euroblock Inputs and Outputs***
- ***Internal Toroidal Transformer***
- ***Dynamic Range of Greater Than 113dB***
- ***User Power Up Features***
- ***Relay Bypass for Power Failure System Protection***

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Service Contact Information

If you require technical support, contact dbx Technical Support. Be prepared to accurately describe the problem. Know the serial number of your device - this is printed on a sticker attached to the chassis. If you have not already taken the time to fill out your warranty registration card and send it in, please do so now. You may also register online at www.dbxpro.com.

Before you return a product to the factory for service, we recommend you refer to the manual. Make sure you have correctly followed installation steps and operation procedures. For further technical assistance or service, please contact our Technical Support Department at (801) 568-7660 or visit www.dbxpro.com. If you need to return a product to the factory for service, you MUST first contact Technical Support to obtain a Return Authorization Number.

No returned products will be accepted at the factory without a Return Authorization Number.

Please refer to the Warranty information on the following page, which extends to the first end-user. After expiration of the warranty, a reasonable charge will be made for parts, labor, and packing if you choose to use the factory service facility. In all cases, you are responsible for transportation charges to the factory. dbx will pay return shipping if the unit is still under warranty.

Use the original packing material if it is available. Mark the package with the name of the shipper and with these words in red: DELICATE INSTRUMENT, FRAGILE! Insure the package properly. Ship prepaid, not collect. Do not ship parcel post.

Warranty

1. The warranty registration card that accompanies this product must be mailed within 30 days after purchase date to validate this warranty. You can also register online at www.dbxpro.com. Proof-of-purchase is considered to be the responsibility of the consumer. A copy of the original purchase receipt must be provided for any warranty service.

2. dbx warrants this product, when purchased new from an authorized U.S. dbx dealer and used solely within the U.S., to be free from defects in materials and workmanship under normal use and service. This warranty is valid to the original purchaser only and is non-transferable.

3. dbx liability under this warranty is limited to repairing or, at our discretion, replacing defective materials that show evidence of defect, provided the product is returned to dbx WITH RETURN AUTHORIZATION from the factory, where all parts and labor will be covered up to a period of two years. A Return Authorization number must first be obtained from dbx. The company shall not be liable for any consequential damage as a result of the product's use in any circuit or assembly.

4. dbx reserves the right to make changes in design or make additions to or improvements upon this product without incurring any obligation to install the same additions or improvements on products previously manufactured.

5. The foregoing is in lieu of all other warranties, expressed or implied, and dbx neither assumes nor authorizes any person to assume on its behalf any obligation or liability in connection with the sale of this product. In no event shall dbx or its dealers be liable for special or consequential damages or from any delay in the performance of this warranty due to causes beyond their control.

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Installation Recommendations

FOR RACK MOUNT USE ONLY - Install the iEQ in your rack with the provided rack screws. When installed in a rack, the unit should be positioned with enough room (at least one 1U above the unit and 1U below the unit) to allow proper ventilation. The iEQ should not be mounted above or below anything that generates excessive heat. Ambient temperatures should not exceed 113°F (45°C) when equipment is in use. Although the unit is shielded against radio frequency and electromagnetic interference, extremely high fields of RF and EMI should be avoided where possible.

Basic Connection of the iEQ

The iEQ Series Equalizers have balanced inputs and outputs that can be used with any balanced or unbalanced line-level device.

To connect the equalizer to your sound system refer to the following steps:

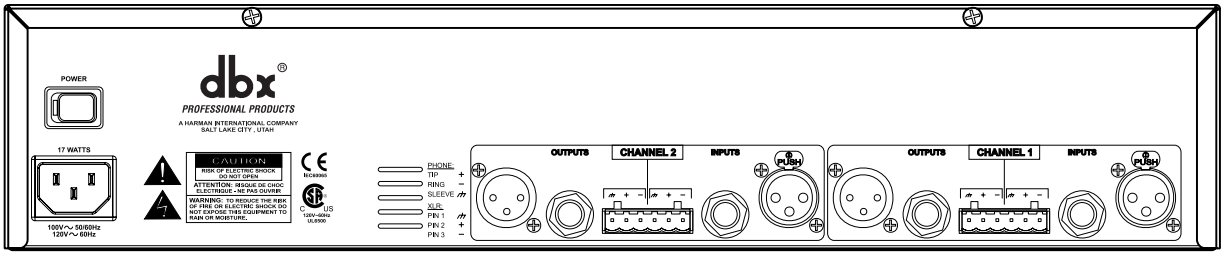
- Turn off all equipment before making connections.
- Make audio connections via XLR, 1/4" TRS jacks, or Euroblock connectors according to application needs. All three types of connectors for the inputs and outputs can be used for balanced or unbalanced connections. The use of more than one connector at a time for the inputs could unbalance balanced lines, cause phase cancellation, short a conductor to ground, or cause damage to other equipment connected to the equalizer. More than one output may be used simultaneously as long as the combined parallel load is greater than 600Ω.
- Select the operating range with the Boost/Cut range selection switch.

  NOTE: Whenever amplifiers are powered on, be sure to reduce audio levels at the power amplifiers when changing the setting of this switch as it may generate an audible transient.
- Apply power to the equalizer. Connect the AC power cord to the AC power receptacle on the back of the equalizer. Route the AC power cord to a convenient power outlet away from audio lines. The unit may be turned on and off from the rear panel power switch or a master equipment power switch. Since the iEQ Series Equalizers consume a relatively small amount of power, the units may be left on continuously.

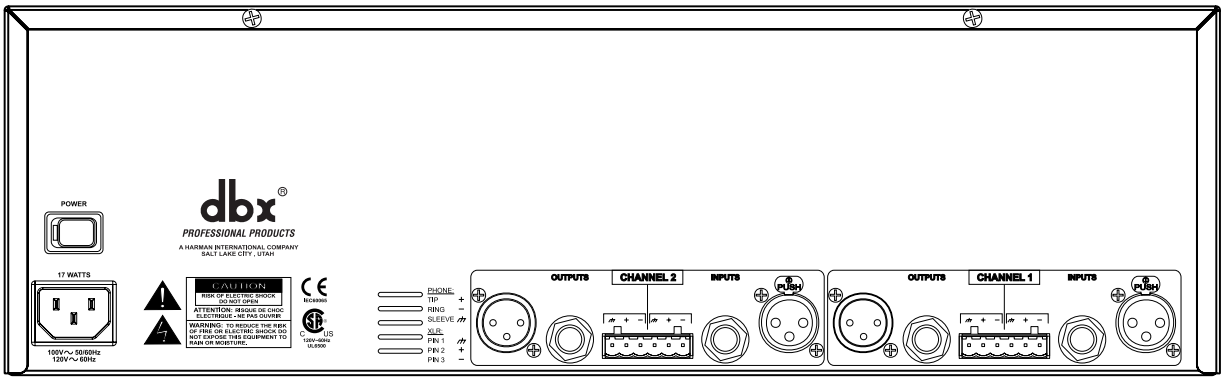
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Rear Panel

iEQ-15 - dual channel 15 band graphic equalizer



iEQ-31 - dual channel 31 band graphic equalizer



Power Cord Receptacle

Connects AC power to the equalizer.

Power Switch

Switches the power on and off. Always make audio connections with the power switch in the off position.

Input Connectors

Three types of input connectors are provided for input connections: female locking XLR type connectors, 1/4" tip-ring-sleeve phone jack connectors, and Euroblock. The maximum input level that the equalizer can accept is +20dBu (ref: 0.775Vrms).

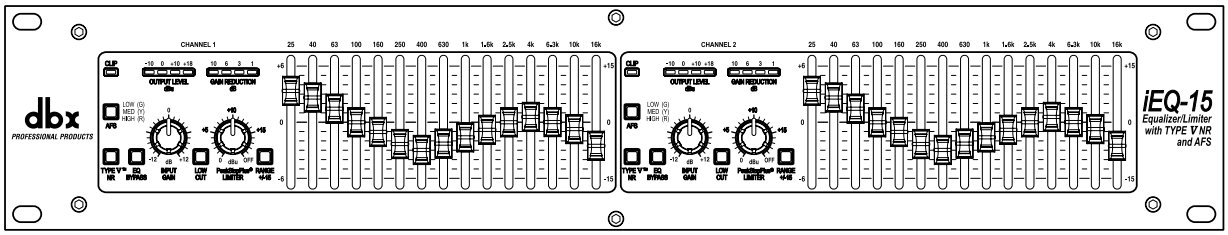
Output Connectors

Three types of output connectors are provided for output connections: male XLR type connectors, 1/4" tip-ring-sleeve phone jack connectors and Euroblock. More than one output may be used simultaneously as long as the combined parallel load is greater than 600Ω.

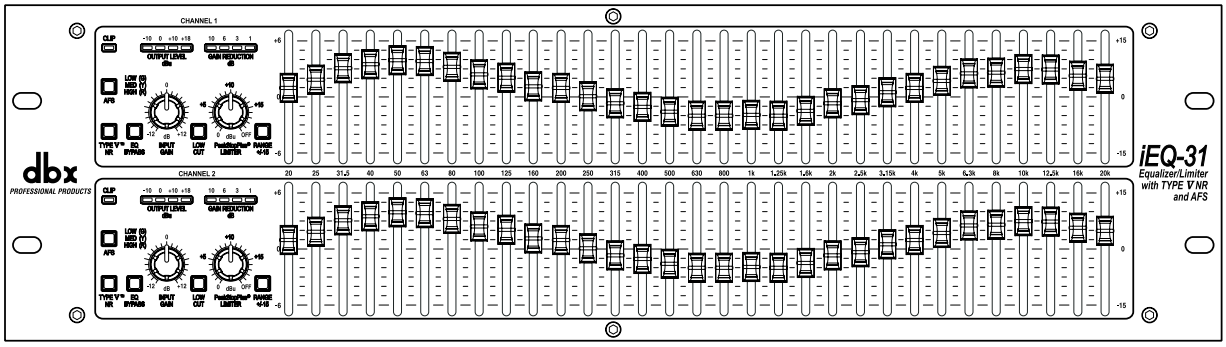
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Front Panel

iEQ-15 - dual channel 15 band graphic equalizer



iEQ-31 - dual channel 31 band graphic equalizer



Input Gain Control

This control sets the signal level to the equalizer. It is capable of -12dB to +12dB of gain. Its affect is apparent by viewing the OUTPUT LEVEL bar graph.

EQ Bypass Button

This button removes the graphic equalizer section from the signal path. The BYPASS button does not, however, affect the INPUT GAIN, AFS, PeakStopPlus® LIMITER , or LOW CUT filters. This button lights red when the EQ is in bypass mode

RANGE +/-15 Button

This button selects which of the two boost/cut ranges the equalizer will use, either ±6dB or ±15dB. The button lights red when the ±15dB range is selected.

Output Level Bar Graph

These four LEDs indicate output level of the equalizer. It monitors the level at the output of the equalizer after all other processing, including the limiter.

Clip LED

This LED lights whenever any internal signal level reaches 1dB below clipping, which may occur when any of the following happen: 1) the input signal is "hotter" than +20dBu, 2) excessive gain is applied by the input gain control, or 3) excessive boost is applied using the frequency sliders.

Gain Reduction Meter

These four LEDs indicate the amount of gain reduction being induced by the setting of the PeakStopPlus® LIMITER control as the signal level from the graphic EQ section exceeds this limiter threshold setting.

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PeakStopPlus® Limiter Control

This control engages the PeakStopPlus™ limiter. It sets the threshold level at which ∞:1 gain reduction will begin to occur. It is capable of a range of 0dBu through "OFF" (+20dBu). When the threshold control is set to "OFF", the limiter is effectively disabled, and no gain reduction will occur.

AFS™ (Advanced Feedback Suppression) Button

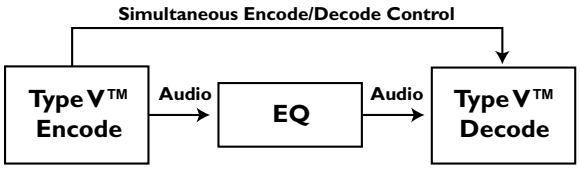
This button engages the AFS function of the iEQ-15 and iEQ-31 and clears the AFS filters. If AFS is off, the filters are bypassed and the algorithm is halted (the filters are not updated). If AFS is on, the filters are active. The AFS selections represent the width of the filters and determine how fast AFS reacts. These AFS selections are as follows:

AFS Selection	Description	AFS Button LED Color	Bandwidth	Q
Off	AFS processing is disabled.	Off	-	-
Music Low	Faster response time, lower fidelity.	Green	1/10 Octave	14.5
Music Medium	Good combination of response time and fidelity.	Yellow	1/20 Octave	29
Music High	Slightly slower response time, high fidelity.	Red	1/80 Octave	116

See the "Operation" section of this manual for further information regarding AFS.

Type V™ NR Button

This button engages the dbx Type V™ noise reduction circuit within the iEQ. Typically, graphic equalizers will raise the noise floor as the frequency band sliders are adjusted. dbx's proprietary Type V™ noise reduction solves this problem by reducing the apparent noise floor using its simultaneous encode/decode process (shown below). The button lights when the dbx Type V™ noise reduction circuit is activated.



NOTE: dbx Type V™ noise reduction effectively reduces the inherent noise floor within the iEQ. However, it will not reduce noise introduced into the system from other locations in the signal path.

Frequency Band Sliders

Each one of these slider potentiometers will boost or cut at its noted frequency by ±6dB or ±15dB, depending upon the position of the RANGE button. When all the sliders are in the center detented position, the output of the equalizer is flat. The frequency band centers of the iEQ-31 are marked at 1/3rd of an octave intervals on ISO standard spacings, while the frequency band centers of the iEQ-15 are marked at 2/3rds of an octave intervals on ISO standard spacings.

Low Cut Button

The LOW CUT button inserts (when lit) or removes the 18dB/octave 40Hz Bessel low-cut filter from the signal path. When the LOW CUT button is pushed in, the LOW CUT filter is in the audio path.

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Power-Up Modes

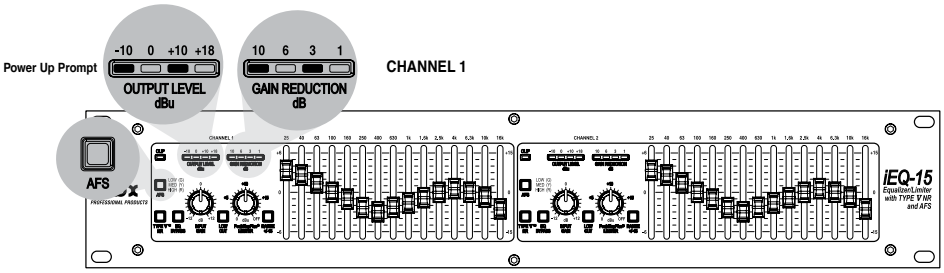
The iEQ Series EQs provide the ability to lock the front panel controls and edit how AFS will function. These changes are performed in the Power-Up Mode menus and are described below.

IMPORTANT! It is recommended that you power off your amplifiers or turn down their attenuators before power cycling the iEQ and performing the following Power-Up Mode changes.

To enter, navigate, and edit options within these Power-Up Mode menus, follow these steps:

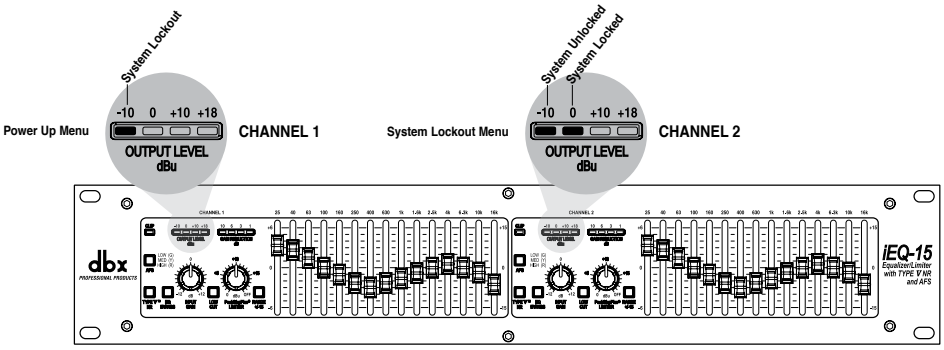
1. Entering the Power-Up Mode Menus

While applying power to the iEQ, press and hold the CHANNEL 1 **<AFS>** button until the following LED pattern is displayed on the CHANNEL 1 meters:



2. The Menus

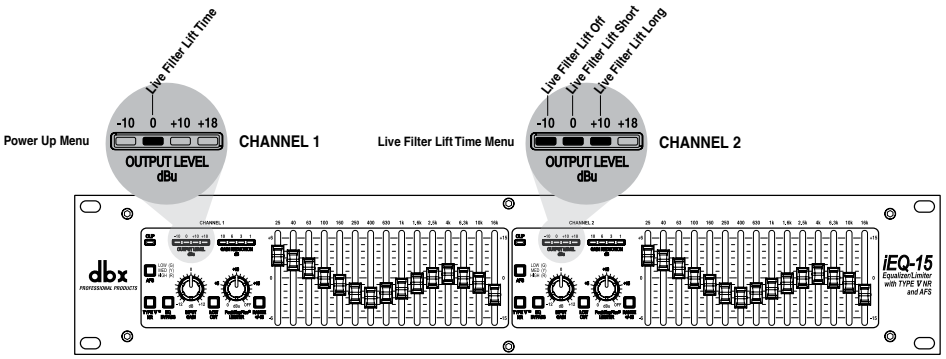
System Lockout Menu - To select the System Lockout menu, press and release the CHANNEL 1 **<AFS>** button until the CHANNEL 1 **-10 LED** is lit as shown in the proceeding illustration. Now press and release the CHANNEL 2 **<AFS>** button to toggle through the available options which are displayed on the CHANNEL 2 OUTPUT LEVEL meter as shown in the proceeding illustration.



- **System Unlocked:** When this mode is selected, access to all front panel functions will be allowed.
- **System Locked:** When this mode is selected, all front panel functions will be locked with the exception of the INPUT GAIN controls and AFS filter clearing function.

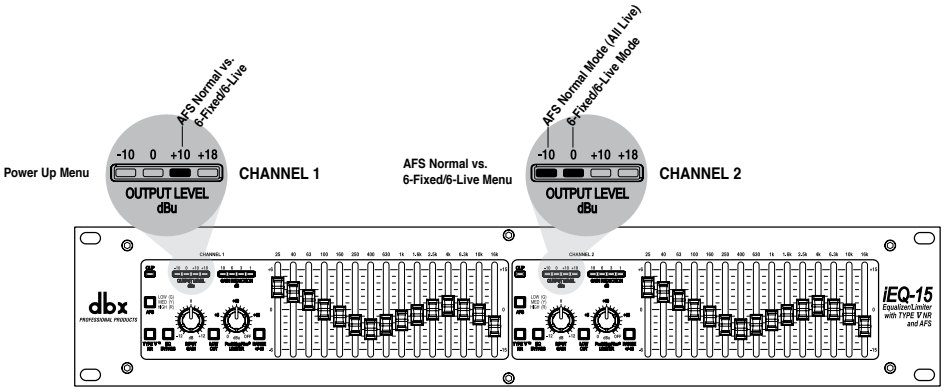
Live Filter Lift Time Menu - To select the Live Filter Lift Time menu, press and release the CHANNEL 1 **<AFS>** button until the CHANNEL 1 **0 LED** is lit as shown in the proceeding illustration. Now press and release the CHANNEL 2 **<AFS>** button to toggle through the available options which are displayed on the CHANNEL 2 OUTPUT LEVEL meter as shown in the proceeding illustration.

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- **Live Filter Lift Off:** Selecting this option will disable the Live Filter Lift feature.
- **Live Filter Lift Short:** This option sets the Live Filter Lift Time to 10 minutes, at which time the AFS algorithm will determine if the filter needs to remain or if it can be cleared.
- **Live Filter Lift Long:** This option sets the Live Filter Lift Time to 60 minutes, at which time the AFS algorithm will determine if the filter needs to remain or if it can be cleared.

AFS Normal vs. 6-Fixed/6-Live Menu - To select the AFS Normal vs. 6-Fixed/6-Live menu, press and release the CHANNEL 1 **<AFS>** button until the CHANNEL 1 **+10 LED** is lit as shown in the proceeding illustration. Now press and release the CHANNEL 2 **<AFS>** button to toggle through the available options which are displayed on the CHANNEL 2 OUTPUT LEVEL meter as shown in the proceeding illustration.



- **AFS Normal Mode:** This mode provides 12 Live filters and no Fixed filters. Use this mode when you want to get up and runing quickly and do not require any Fixed filters to be stored.
- **6-Fixed/6-Live Mode:** This mode provides 6 Fixed filters and 6 Live filters. Use this mode when you intend to ring out the system before use (using the Fixed filters) and also require Live filters for feedback suppression control during the performance. This mode is often best suited for fixed installation.

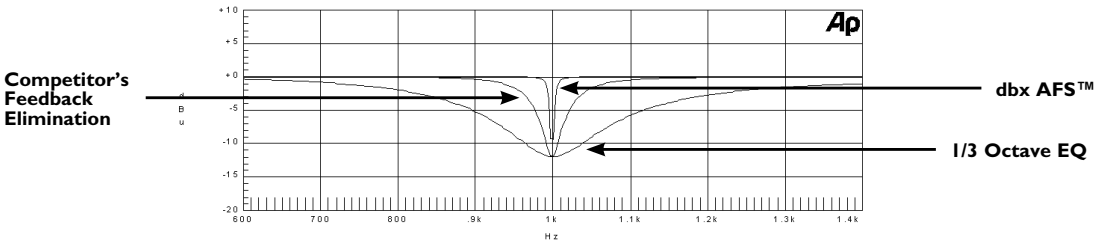
3. Exiting the Power-Up Mode Menus

Once your selections have been made, press and hold the CHANNEL 1 **<AFS>** button until the CHANNEL 1 meter LEDs begin to flash, then release and wait a few seconds for the iEQ to boot.

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AFS™

First introduced in the DriveRack PA and 260 processors, the iEQ-15 and iEQ-31 both utilize dbx's proprietary AFS™ (Advanced Feedback Suppression) algorithm, providing effortless feedback elimination. AFS uses Precision Frequency Detection and state-of-the-art processing to pinpoint, with more accuracy, the exact frequency where feedback occurs. In the past, graphic equalizers were used to eliminate feedback from a system. This was an acceptable method for eliminating feedback, but when this method was precision tested, the result clearly showed that a single 1/3 octave EQ slider was removing approximately half of the signal power. With AFS, the algorithm removes the feedback automatically and the proprietary, precision AFS filters use narrower notch filters for removing the feedback, thereby retaining the sonic integrity of the source material. This is what sets AFS apart from using traditional EQ or other feedback elimination processors for feedback removal. The following graph shows a comparison between AFS filters, the filters available in other feedback eliminators, and conventional graphic EQ filters:



AFS utilizes two types of filters, they are:

- **Fixed Filters** - Fixed filters are used for ringing out a sound system before the system is to be used, thereby notching out the most offending feedback frequencies within the venue. Fixed filters are automatically stored in the iEQ processor, even after a power cycle, until cleared by the user. These filters are typically best suited for fixed installation. To use the Fixed filters, you must configure the iEQ for 6-Fixed/6-Live mode as described in the "Power-Up Modes" section of this manual.
- **Live Filters** - Live filters work in the background and search for feedback during the performance. Once all Live filters have been set, the filters will begin to round-robin (if new feedback occurs, the first Live filter set will be lifted and placed in the new frequency location to eliminate the new feedback). Live filters are cleared when the iEQ is power cycled or when cleared by the user.

NOTE: AFS works best when the gain structure of the sound system has been optimized. During use, the iEQ's 0 dBu LED in the OUTPUT LEVEL meter should light with the +10 dBu LED lighting occasionally.

Clearing Filters

To clear the AFS filters, press and hold the channel's AFS button until the adjacent LED meters begin to flash, then release. This clears all filters which have been set in the channel.

IMPORTANT! It is advised to turn down the system's gain before clearing the AFS filters. If AFS filters are set and feedback suppression is occuring, clearing the filters without turning down the system's gain could cause the system to go into immediate feedback.

For more detailed information regarding the AFS algorithm, please see the AFS white paper located at www.dbxpro.com.

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Quick Start

This section explains the procedure for using the iEQ Series EQs for tuning the left and right front of house speakers in a live sound system.

Using the iEQ in AFS Normal Mode

Use this method when you do not intend to initially ring out the sound system before use. This is the fastest and easiest way to utilize AFS.

1. Configure the iEQ for AFS Normal Mode operation within the Power-Up Mode menu as described in the "Power-Up Modes" section of this manual.
2. Set all controls as follows:
   - Both **AFS** buttons = Off (LEDs off).
   - Both **TYPE V™ NR** buttons = Engaged (LEDs on)
   - Both **EQ BYPASS** buttons = Disengaged (LEDs off)
   - Both **INPUT GAIN** controls = 0dB
   - Both **LOW CUT** buttons = Engage these buttons (LEDs on) as long as you do not have a low cut filter engaged in an active crossover, loudspeaker management processor, your amplifier(s), or powered speakers. If you do have a low cut filter engaged somewhere in the signal chain, post iEQ, leave these buttons disengaged (LEDs off).
   - Both **PeakStopPlus® LIMITER** controls = OFF
   - Both **RANGE +/-15** buttons = Engaged (LEDs on)
     NOTE: Whenever amplifiers are powered on, be sure to reduce audio levels at the power amplifiers when changing the setting of this switch as it may generate an audible transient.
   - All EQ **Frequency Band** sliders = Flat (center detent)
3. For best performance, set the gain structure of the sound system. This is beyond the scope of this manual, but there is much information about this process in books and on the internet. This is when you will determine where the iEQ's **INPUT GAIN** controls need to be initially set (they may require further adjustment after equalizing the sound system as EQ changes may change the output gain of the iEQ processor). This is also when you will set the **PeakStopPlus® LIMITER** controls, if using the iEQ for speaker protection. If you are using dedicated limiters, the limiters within a loudspeaker management processor, powered speakers with built-in limiters, or any limiters post iEQ, set the iEQ's **PeakStopPlus® LIMITER** controls to the "OFF" position.
4. Using a reference CD, a known and trusted vocal mic, or a real time analyzer and calibrated microphone, EQ the sound system to taste.
5. Press and release each **AFS** button until they are both lit yellow.

This completes the iEQ setup process.

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Using the iEQ in AFS 6-Fixed/6-Live Mode

This mode provides 6 Fixed filters and 6 Live filters. This mode is well suited for permanent installations. Use this mode when you intend to ring out the system before use (using the Fixed filters) to eliminate the most prevalent feedback frequencies. 6 Live filters can then be utilized for feedback suppression control during the performance.

1. Configure the iEQ for 6-Fixed/6-Live Mode operation within the Power-Up Mode menu as described in the "Power-Up Modes" section of this manual.
2. Set all controls as follows:
   - Both **AFS** buttons = Off (LEDs off).
   - Both **TYPE V™ NR** buttons = Engaged (LEDs on)
   - Both **EQ BYPASS** buttons = Disengaged (LEDs off)
   - Both **INPUT GAIN** controls = 0dB
   - Both **LOW CUT** buttons = Engage these buttons (LEDs on) as long as you do not have a low cut filter engaged in an active crossover, loudspeaker management processor, your amplifier(s), or powered speakers. If you do have a low cut filter engaged somewhere in the signal chain, post iEQ, leave these buttons disengaged (LEDs off).
   - Both **PeakStopPlus® LIMITER** controls = OFF
   - Both **RANGE +/-15** buttons = Engaged (LEDs on)
     NOTE: Whenever amplifiers are powered on, be sure to reduce audio levels at the power amplifiers when changing the setting of this switch as it may generate an audible transient.
   - All EQ **Frequency Band** sliders = Flat (center detent)
3. For best performance, set the gain structure of the sound system. This is beyond the scope of this manual, but there is much information about this process in books and on the internet. This is when you will determine where the iEQ's **INPUT GAIN** controls need to be initially set (they may require further adjustment after equalizing the sound system as EQ changes may change the output gain of the iEQ processor). This is also when you will set the **PeakStopPlus® LIMITER** controls, if using the iEQ for speaker protection. If you are using dedicated limiters, the limiters within a loudspeaker management processor, powered speakers with built-in limiters, or any limiters post iEQ, set the iEQ's **PeakStopPlus® LIMITER** controls to the "OFF" position.
4. Using a reference CD, a known and trusted vocal mic, or a real time analyzer and calibrated microphone, EQ the sound system to taste.
5. If your gain structure has been properly calibrated, your mixer's master gains should be close to unity gain (0dB). Perform a sound check on each microphone and get them as close as possible to performance level without inducing feedback. If feedback does occur, slightly lower the channel's gain.
6. Now that all microphones have been made live, bring the mixer's master faders all the way down (leave all channel faders where you set them in step 5).
7. Press and release each **AFS** button until they are both lit yellow.
8. Slowly raise the mixer's master output gains until you have heard and eliminated a few feedback frequencies (typically around 5dB above unity gain) As each filter is set, the AFS buttons will flash and the feedback will disappear. Now set your mixer's master gains back to unity gain.
9. If desired, you can now lock out the front panel controls as described in the "Power-Up Modes" section of this manual. This is typically applicable for permanent installations. Ensure the amps are off before power cycling the iEQ and locking out the front panel.

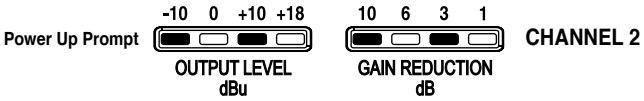
This completes the iEQ setup process.

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Factory Hard Reset

In the event that you experience peculiar behavior with the iEQ or would like to set the Power-Up Mode settings back to their factory default state, please perform the following Factory Hard Reset procedure:

- Power on the unit while pressing and holding the CHANNEL 2 **<AFS>** button until the CHANNEL 2 meters display the LED pattern shown below, then release the button.



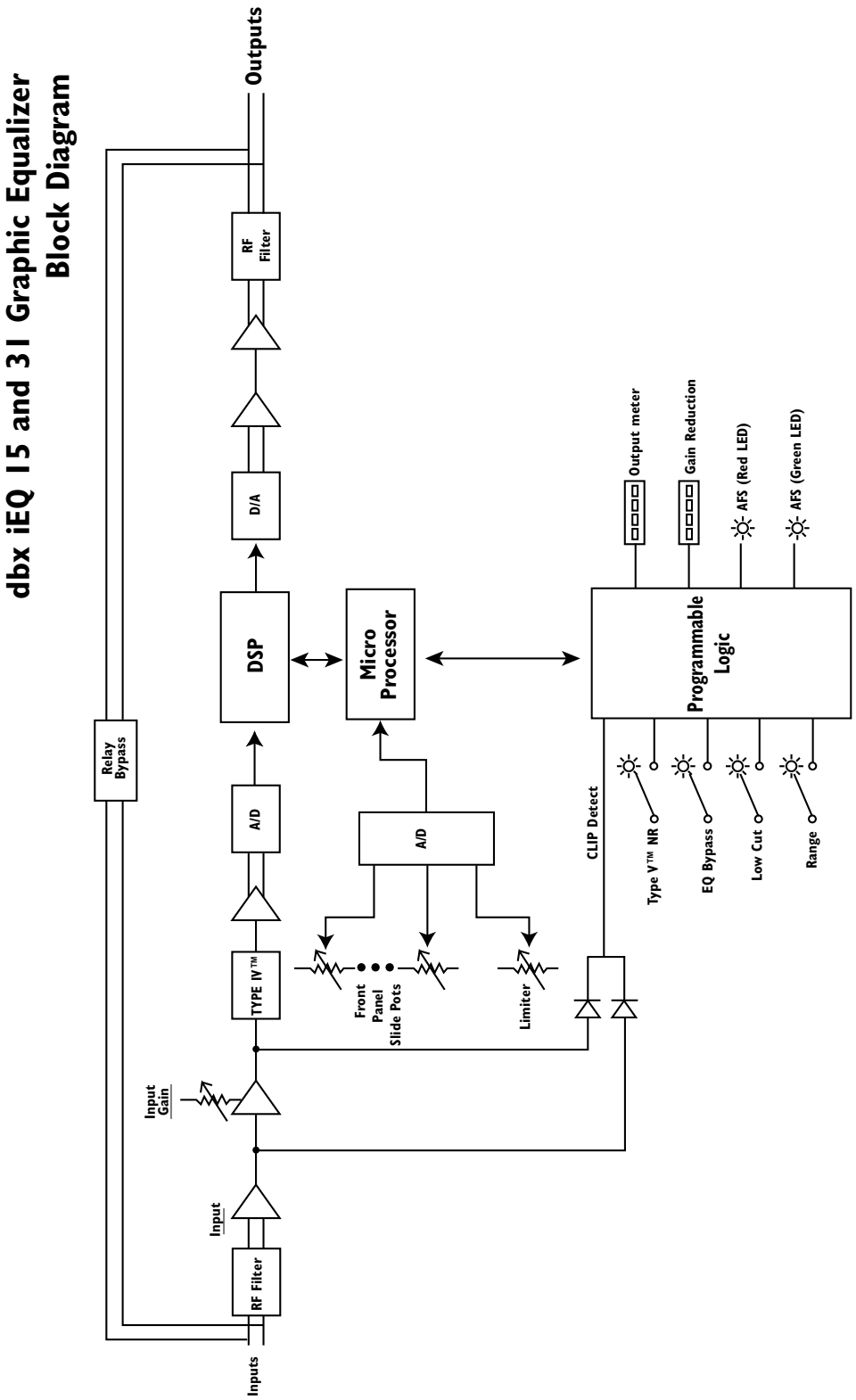
- Press and release the CHANNEL 1 **<AFS>** button until the CHANNEL 1 AFS button LED is lit Yellow.
- To perform the Hard Reset, press and hold the CHANNEL 2 **<AFS>** button until all CHANNEL 2 meter LEDs begin to flash, then release.
- To exit and return to normal operating mode, press and hold the CHANNEL 1 **<AFS>** button until all CHANNEL 1 meter LEDs begin to flash, then release. The unit will take a few seconds to reboot and will then be ready to operate. All settings will now be back to their factory default state.

The iEQ's factory default settings are as follows:

Power-Up Mode Menu	Default Setting
System Lockout	Unlocked
Live Filter Lift Time	Live Filter Lift Off
AFS Normal vs. 6-Fixed/6-Live Mode	AFS Normal Mode

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Block Diagram



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Specifications

Inputs

Connectors:	1/4" TRS, female XLR (pin 2 hot), and Euroblock
Type:	Electronically balanced/unbalanced, RF filtered
Impedance:	Balanced 40kΩ, unbalanced 20kΩ
Max Input Level:	+22dBu balanced or unbalanced
CMRR:	>40dB, typically >55dB at 1kHz

Outputs

Connectors:	1/4" TRS, male XLR (pin 2 hot), and Euroblock
Type:	Balanced/unbalanced, RF filtered
Impedance:	Balanced 120Ω, unbalanced 60Ω
Max Output Level:	+20dBu balanced/unbalanced into 2kΩ or greater

System Performance

Frequency Response:	20Hz to 20kHz, +0.5/-0.25dB
Dynamic Range:	>113dB, "A" weighted
THD+Noise:	0.003% typical at +4dBu, 1kHz
Interchannel Crosstalk:	<-80dB, 20Hz to 20kHz
Noise Reduction:	Up to 10dB of dynamic broadband noise reduction
Digital Resolution:	24 bits
Sample Frequency:	48kHz
Latency:	2msec

Function Buttons

AFS™:	Activates dbx AFS™ Advanced Feedback Suppression
TYPE V™ NR:	Activates dbx Type V™ Noise Reduction
EQ Bypass:	Bypasses the graphic equalizer section in the signal path
Low Cut:	Activates the 40Hz 18dB/octave Bessel high-pass filter Range
Range:	Selects either +/- 6dB or +/- 15dB slider boost/cut range

Indicators

Output Level:	4-LED bar graph (Green, Green, Yellow, Red) at -10, 0, +10, and +18dBu
Gain Reduction:	4-LED bar graph (all Red) at 0, 3, 6, and 10dB
Type V™ NR:	1 LED: yellow, green or red
EQ Bypass:	1 LED: red
Clip:	1 LED: red
Low Cut:	1 LED: red
+/-15dB:	1 LED: red

Power Supply

Operating Voltage:	120VAC 60Hz, 220-240VAC 50/60Hz
Power Consumption:	17 Watts
Mains Connection:	IEC receptacle

Physical

Dimensions:	iEQ-15: 3.5" (H) X 19" (W) X 7.9" (D) (8.9cm x 48.3cm x 20.1cm) iEQ-31: 5.25" (H) X 19" (W) X 7.9" (D) (13.4cm x 48.3cm x 20.1cm)
Weight:	iEQ-15: 7.5 lbs. iEQ-31: 9.25 lbs.
Shipping Weight:	iEQ-15: 8.5 lbs. iEQ-31: 10.25 lbs.

NOTE: Specifications subject to change.

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