EUREKA

MICROPHONE PREAMPLIFIER

COMPRESSOR

PARAMETRIC EQUALIZER

USER'S MANUAL

version 1.0

W A R R A N T Y

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1 OVERVIEW

1.1 INTRODUCTION

Thank you for purchasing the PreSonus EUREKA. PreSonus Audio Electronics has designed the EUREKA utilizing high-grade components to insure optimum performance for an infinite period of time. We believe the EUREKA to be an exceptional sounding unit and an exceptional value. We encourage you to contact us at 1-800-750-0323 with any questions or comments you may have regarding your PreSonus equipment. PreSonus Audio Electronics is committed to constant product improvement, and we value your suggestions highly. We believe the best way to achieve our goal of constant product improvement is by listening to the real *experts*, our valued customers. We appreciate the support you have shown us through the purchase of this product.

Please pay close attention to how you connect your EUREKA to your system. Improper grounding is the most common cause of noise problems found in studio or "live" sound environments. We would like to suggest that you use this manual to familiarize yourself with the features, applications and correct connection procedure for your EUREKA before trying to hook it up to your system. Thank you, once again, for buying our product and may we wish you Good Luck and enjoy your EUREKA!

1.2 FEATURES

The following information is a summary of your EUREKA's features:

Microphone Pre-Amplifier. Your EUREKA contains a Class A discrete input buffer followed by a dual servo gain stage. This arrangement results in ultra low noise and wide gain control allowing the EUREKA user to boost desirable signal without increasing unwanted background noise.

? **48 Volt Phantom Power.** The EUREKA has 48V Phantom power available. This assures optimum performance of your condenser microphones that require Phantom power and that the power supplied will be free of noise or distortion.

? **Pad.** A 20dB pad is available for reducing the in-coming signal level. This pad provides a more manageable signal from high output devices giving

greater control over the in-coming signal and a much reduced chance of over-driving the input and avoiding distortion.

? **+22dBu Headroom.** The EUREKA mic-pre has +22 dBu of headroom. This feature gives you wide dynamic range and excellent transient response characteristics.

? **Saturation Control.** The EUREKA offers a very high quality transformer and features an SATURATION control (this control adjusts the drain current on the input FET amplifier altering the even harmonic levels of the signal being passed) with an adjustment range of 0% to 100%. The 0% position passes a pure signal. As the control is rotated to the 100% position, the signal's even harmonic series is boosted giving the signal "warmth" very much like a vacuum tube or similar to the sound of analog tape saturation. This remarkable effect gives you the sound of a tube without the headache of uneven performance often encountered with vacuum tube devices ("no tube to pick-up RF or to age and become " microphonic").

? **Variable Microphone Input Impedance.** This feature enables you to "tune" your microphone – by matching the output impedance of your microphone with your microphone preamplifier. This works especially well for ribbon microphones. Changing the input impedance is also effective for dynamic and condenser microphones and can be the perfect solution for a given recording application.

? **Phase Reverse.** Use the phase reverse switch to combat phase cancellation with other open microphones.

Full Featured Compressor with High Pass Filter. The EUREKA is equipped with a Compressor with a high pass side chain filter designed especially for frequency specific processing.

? **Soft Knee Compression.** Soft Knee Compression causes the compression to set in gradually producing a more musical response

? **Bypass.** The Bypass switch lets you compare the compressed sound quickly to the uncompressed sound.

3-Band Parametric Equalizer. Total tonal control is what the Equalizer section provides. The EQ will let you fine tune the sound to suit your taste with exacting precision.

? **Bypass Switch.** A bypass switch is provided to audition the signal in an equalized version as compared to a direct unaffected signal.

? **Variable Q**. Adjusts the width of the frequency band between wide and narrow during equalization.

? **EQ? COMP.** Switches the order of the signal chain putting EQ before the Compressor.

Master Section

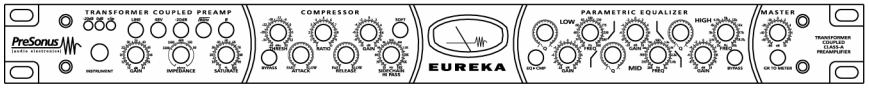
? **Gain Reduction to Meter.** Shows gain reduction on the meter implemented by the compressor.

? **Level.** The output of the EUREKA is adjusted by the Level control and is useful for compensating for gain loss due to compression or to decrease output signal that boosting frequencies with the Equalizer section may have caused. The output is variable from –80 dB to +10 dB.

? **VU Meter.** The VU meter provides an accurate reading of the output level and a reference of signal presence. It can also be switched to monitor gain reduction when using the compressor.

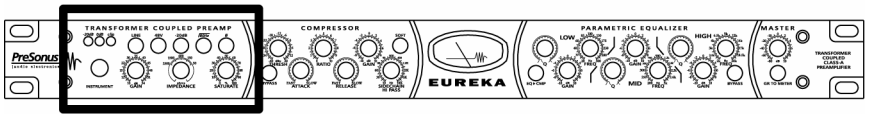
2 CONTROLS & CONNECTIONS

2.1 FRONT PANEL BASIC LAYOUT



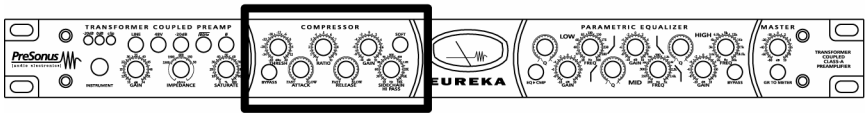
The front panel of the EUREKA is divided into four sections – Preamplifier, Compressor, Equalizer and Master.

Preamplifier section:



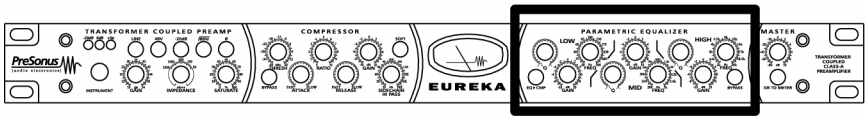
- Gain Control
- Impedance Control
- Saturation Control
- +48 Volt Switch
- -20db Pad
- Phase Reverse Button
- 80Hz Filter
- Line Input Select Button
- LED Input Meter

Compressor Section:



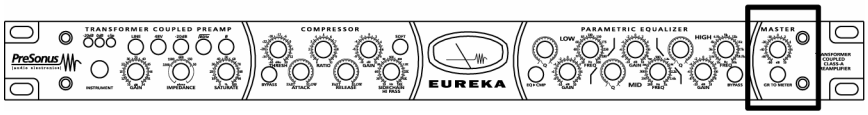
- Level Control (Attack, Release, Ratio, Threshold, Gain)
- Soft Knee Switch
- Bypass Switch
- Hi-pass Sidechain Filter

Equalizer Section:



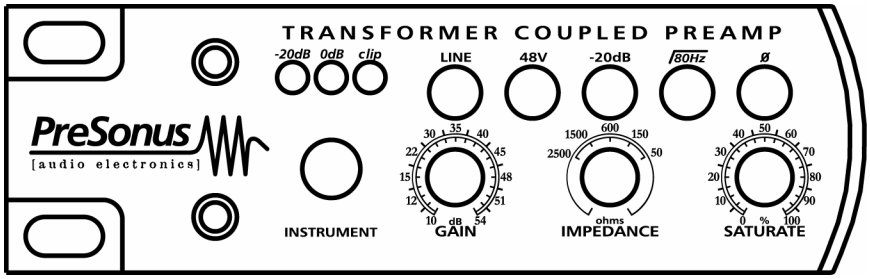
- 3 Band Parametric
- 80 Hz Filter Switch
- Bypass Switch

Master Section:



- Level Control
- Gain Reduction to Meter Button

2.2 PREAMPLIFIER



GAIN: Provides +52dB of gain for the microphone input and +44dB of gain for the instrument input.

IMPEDANCE SELECTOR: Selects the amount of resistance that is applied to the microphone input. This selector allows you to match (or intentionally mismatch) the input impedance of the Eureka with the impedance of your microphone. As the Eureka's impedance is lowered, different filtering effects can result delivering a tailored sound for a particular application.

SATURATION CONTROL: Selects the amount of increase (0% to 100%) applied to the even harmonic series of the signal being amplified by the EUREKA. The effect of manipulating the harmonic distortion is of increasing or decreasing the apparent "warmth" of the signal. This feature is derived from manipulating the drain current of the FET input buffer of the Mic Preamp. Experiment with the SATURATION control and see what type of sounds you can get from your present microphone selection.

LINE: Selects the line input on the back as the input in use. When using the Line input, the microphone preamplifier stage is bypassed and thus the GAIN, IMPEDANCE and SATURATE controls are inactive.

+48V: The 48 volts supplied by way of the XLR connector, provides power for condenser mics and any other devices requiring continuous phantom power through the XLR input. This power is supplied at a constant level to prevent any degradation

of audio quality.

XLR connector wiring for **Phantom Power**

Pin 1= GND Pin 2= +48V Pin3= +48V

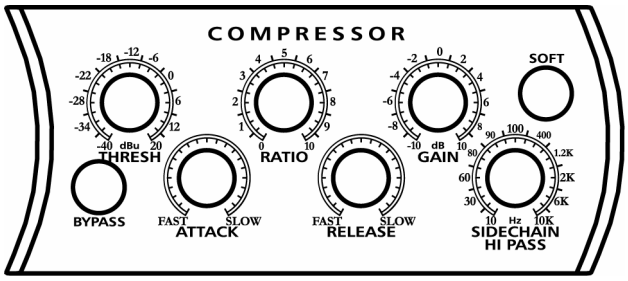
PAD: Engaging the Pad switch provides -20dB of attenuation with the push of a button. This is a very useful feature for rapidly reducing the level coming into the EUREKA and thus preventing the input signal from over-driving (distorting) the input. This may occur due to high output level from a microphone or other device. Padding the input serves to provide increased "headroom" for the operator while lessening the likelihood of input signal overload.

80Hz: The 80Hz button is a low-end roll-off filter. When pushed in, the 80Hz button causes all frequencies below 80Hz to be attenuated (dropped) by 12dB. This filter can be handy in live and studio applications. For example, the 80Hz filter can help to reduce the "boominess" or " muddiness" of a vocal and improve the overall clarity.

Ø (Phase Reverse): Reverses the polarity of the signal. Use the phase reverse when recording with more than one open microphone to combat phase cancellation between microphones.

INSTRUMENT: ¼" TS connector. When an instrument is plugged into the instrument input, the microphone preamplifier is bypassed and the Eureka becomes an active instrument preamplifier.

2.3 COMPRESSOR



THRESHOLD: Sets the level at which compression begins. The below and above LED's over the Threshold knob indicate whether the input signal is below or above the Threshold setting. When the signal is above the Threshold setting, it becomes 'eligible' for compression. Basically, as you turn the Threshold knob counter-clockwise, the input signal is compressed. (If you have a ratio setting of greater than 1:1.)

RATIO: Sets the compression slope. This is defined as the output level versus the input level. For example, if you have the Ratio set to 2:1, any signal level above the Threshold setting will be compressed at a compression ratio of 2:1. This simple means that that for every 1dB of level increase into the compressor, the output will only increase ½ dB, thus producing a compression Gain reduction of 0.5 db. As you increase the Ratio, the compressor gradually becomes a limiter. A limiter is defined as a processor that limits the level of signal to the setting of the Threshold. For example, if you have the Threshold knob set at 0 dB, and the Ratio turned fully clockwise, the Compressor acts as a Limiter at 0 dB. This means the signal will be limited to an output of 0 dB regardless of the input signal.

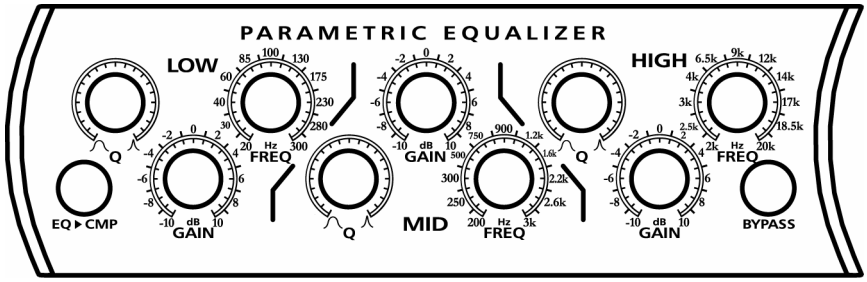
ATTACK: Sets the speed at which the compressor 'acts' on the input signal. A slow attack time (fully clockwise) allows the beginning envelope of a signal (commonly referred to as the initial transient) to pass through the compressor uncompressed, whereas a fast attack time (fully counterclockwise) immediately subjects the signal to the Ratio and Threshold settings of the compressor.

RELEASE: Sets the length of time the compressor takes to return the Gain reduction back to zero (no gain reduction). Very short Release times can produce a very choppy or 'jittery' sound, especially in low frequency instruments such as bass guitar. Very long Release times can result in an overly compressed signal, sometimes referred to as 'squashing' the sound. All ranges of Release can be useful at different times however and you should experiment to become familiar with the different sound possibilities. (Refer to the applications section of this manual for some ideas.)

SOFT: selects Soft Knee and Hard Knee compression curves. When this button is pushed in, Soft knee compression curves are used, otherwise hard knee compression curves are used. With Hard knee compression, the gain reduction applied to the signal occurs as soon as the signal exceeds the level set by the threshold. With Soft knee compression, the onset of gain

reduction occurs gradually after the signal has exceeded the Threshold, producing a more musical response (to some folks).

2.4 EQUALIZER



The EQ is divided into three sections or bands (Low, Mid and High) Each band has the following controls:

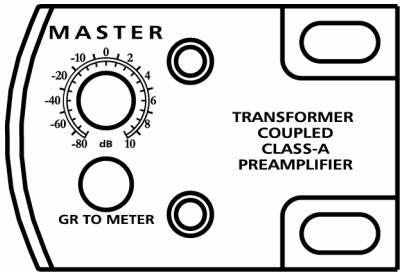
GAIN: Controls the amount of cut or boost of the corresponding frequency. Each gain control offers +/-10dB of attenuation.

FREQUENCY: Selects the center frequency of equalization. If the gain is set to 0, this control will have no effect.

Q (Bandwidth): Controls the width of the frequency being adjusted. Q is defined as the ratio of the center frequency divided by bandwidth. If the gain is set to 0, this control will have no effect. The Q on the Eureka ranges from 0.4 (wide) to 2.0 (narrow). In octaves the Q on the Eureka ranges from 3 octaves to 2/3 octaves.

BYPASS: When pushed in, the EQ is no longer equalizing the signal.

2.5 MASTER

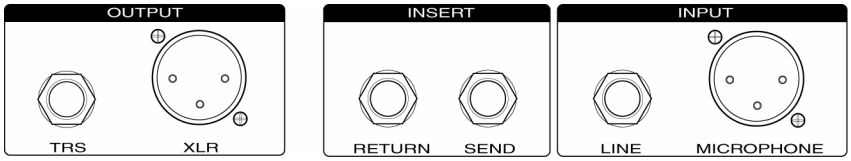


MASTER (LEVEL): This control adjusts the output level of the EUREKA. It functions as a master fader for the entire processing strip. It is useful for adjusting the overall output level up or down to match the optimum input level of a recorder, mixer, etc.

GR TO METER: When pushed the VU meter reads Gain Reduction of the Compressor. When not pushed, the VU meter reads output level.

2.4 BACK PANEL BASIC LAYOUT

Connectors



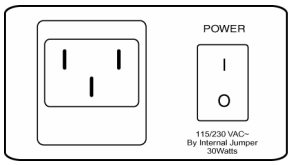
All Input and Output connectors are servo balanced. XLR or ¼" TRS with the following wiring standard:

XLR/TRS		
PIN 1 / Sleeve	GND	
PIN 2/ Tip	High	(+)
PIN 3/ Ring	Low	(-)

INSERT: Return and Send connectors are provided for use in conjunction with audio process devices such as reverbs, delays, de-essers, etc.

NOTE: The LINE IN jack does not work unless the LINE button on the front of the unit is pushed in.

2.7 POWER SUPPLY



The **Power Jack** on your EUREKA accepts a standard IEC cord like those found on most computers and professional recorders.

The Power button on the Eureka is located next to the Power Jack.

Note: The input power voltage is set at the factory to correspond with the country in which it was shipped..

3 OPERATION

3.1 MICROPHONES

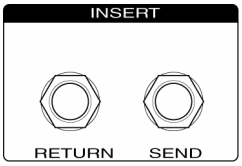
The Eureka works great with all types of microphones including dynamic, ribbon and condenser microphones. Dynamic microphones and ribbon microphones are generally lower output devices and require no external power source. Condenser microphones are generally more sensitive than dynamic and ribbon microphones and typically require external 48V phantom power.

Microphone Input Impedance

You can adjust the input impedance on the Eureka to match or "tune" a particular microphone to achieve a desired sound. Most microphone preamplifiers have a fixed microphone input impedance of 1000 to 2000 ohms. The Eureka has five different impedance values to select from: 50, 150, 600, 1500 and 2500.

Refer to your microphone specifications to find the microphone output impedance and experiment with matching the Eureka's input impedance with the microphone's output impedance. As the impedance on the Eureka is lowered, a resistive load is put on the microphone. This will not damage a microphone. However lowering or raising the impedance can create subtle coloring and filtering effects and can be a perfect solution for a particular application.

3.2 SEND AND RETURN



The EUREKA features ¼" TRS balanced **Send** and **Return** jacks. These connectors allow the use of external processors such as reverbs, de-essers, limiters, EQ's, etc. Simply connect the send jack, balanced or unbalanced to the input of the external processor. Then connect the EUREKA's return jack to the output of the external

processor. The signal is now routed out of the EUREKA, into the external processor, then back into the EUREKA. The final, processed signal will be available at the EUREKA output connector. The Send and Return signal will be inserted after the microphone preamplifier, before the compressor.

3.3 192K/24-BIT DIGITAL OUTPUT CARD (OPTIONAL)

A 192K/24-BIT Digital Output Card is available as an *option* for the PreSonus EUREKA. It has AES/EBU and SPDIF output connectors, as well as, an auxiliary ¼" TRS analog Line input connector. The card has a selectable sample rate of 192kHz, 96kHz, 48kHz and 44.1kHz. The A/D converters provide psycho-acoustic dithering for improved BIT resolution when conversion from 24-BIT to 16-BIT sampling is necessary. The ¼" TRS Line input will provide the benefit of allowing two EUREKA's to share one Digital Output Card and in so doing, share both sides of the A/D converter.

3.4 APPLICATION SETTINGS

The following are application settings to *get you started* in using your Eureka. Feel free to experiment by pushing any and all buttons and turning knobs to their extreme values - remember there are no rules when creating music. Let your imagination and ear guide and direct the way you set your Eureka.

Note that the application settings do not include the main preamplifier controls: GAIN, IMPEDANCE and SATURATE. Set these preamplifier controls with the compressor and EQ in bypass for initial levels and tonal quality. Use the 80Hz hi-pass filter to roll off low frequency rumble and muddiness.

Once you get a sound that you like, go back to the IMPEDANCE and SATURATE controls to further tailor your sound.

1. Vocal

Compressor Settings

Thresh	Ratio	Gain	Soft	Bypass	Attack	Release	SC-HP
-18	6	+2	In	Out	Mid	Mid	10

Equalizer Settings

	LOW			MID			HIGH		
EQ>Comp	Q	Gain	Freq	Q	Gain	Freq	Q	Gain	Freq
Out	n/a	0	n/a	Mid	+2	2.2k	Wide	+4	20k

2. Acoustic Guitar

Compressor settings

Thresh	Ratio	Gain	Soft	Bypass	Attack	Release	SC-HP
-20	3	+2	In	Out	Mid	Fast	10

Equalizer settings

	LOW			MID			HIGH		
EQ>Comp	Q	Gain	Freq	Q	Gain	Freq	Q	Gain	Freq
Out	n/a	0	n/a	Nar	-2	3k	Wide	+3	18.5k

Nar = Narrow Q

3. Electric Guitar

Compressor settings

Thresh	Ratio	Gain	Soft	Bypass	Attack	Release	SC-HP
-18	5	1	In	Out	Fast	Mid	10

Equalizer settings

	LOW			MID			HIGH		
EQ>Comp	Q	Gain	Freq	Q	Gain	Freq	Q	Gain	Freq

Out	n/a	0	n/a	Mid	+2	2.2k	Wide	+4	9k

4. Bass Guitar

Compressor settings

Thresh	Ratio	Gain	Soft	Bypass	Attack	Release	SC-HP
-15	7	+4	In	Out	MF	MS	10

Equalizer settings

	LOW			MID			HIGH		
EQ>Comp	Q	Gain	Freq	Q	Gain	Freq	Q	Gain	Freq
Out	Wide	+6	85	MN	-3	2.2k	n/a	0	n/a

MN – Medium Narrow, MW – Medium Wide

5. Keyboards

Compressor settings

Thresh	Ratio	Gain	Soft	Bypass	Attack	Release	SC-HP
-22	4	+4	Out	Out	MF	MS	60

Equalizer settings

	LOW	MID	HIGH

EQ>Comp	Q	Gain	Freq	Q	Gain	Freq	Q	Gain	Freq
Out	Wide	-3	20	MN	+4	2.2k	Wide	+3	6.5k

MN-Medium Narrow

6. Kick Drum

Compressor settings

Thresh	Ratio	Gain	Soft	Bypass	Attack	Release	SC-HP
-18	5	+2	Out	Out	MF	MF	80

Equalizer settings

	LOW			MID			HIGH		
EQ>Comp	Q	Gain	Freq	Q	Gain	Freq	Q	Gain	Freq
In	Wide	+8	60	Nar	-8	400	Wide	+6	2.5k

7. Snare

Compressor settings

Thresh	Ratio	Gain	Soft	Bypass	Attack	Release	SC-HP
-22	6	+4	In	Out	Med	Med	10

Equalizer settings

	LOW	MID	HIGH

EQ>Comp	Q	Gain	Freq	Q	Gain	Freq	Q	Gain	Freq
Out	n/a	0	n/a	Med	+2	1k	Wide	-2	20k

8. Drum Overheads

Compressor settings

Thresh	Ratio	Gain	Soft	Bypass	Attack	Release	SC-HP
-22	5	Fast	Out	Out	Fast	Med	400

Equalizer settings

	LOW			MID			HIGH		
EQ>Comp	Q	Gain	Freq	Q	Gain	Freq	Q	Gain	Freq
Out	Wide	-4	40	n/a	0	n/a	Wide	+2	20k

4 TECHNICAL

EUREKA SPECIFICATIONS

Channels ..... ONE
Dynamic Range ..... >115dB
Headroom ..... +22dBu
Frequency Response ..... 10Hz to 50kHz
Internal Operating Level ..... 0dBu = 0dB

Microphone /Instrument Preamplifier

Gain ..... + 12dB to +52dB
Noise Floor ..... -112dBu (+12dB gain)
EIN ..... -127dB
THD + Noise(0% Saturation) ..... <0.005%
THD + Noise (Full Saturation) ..... <0.5%
Microphone Input Connector ..... XLR
Mic Input Impedance (selectable) ..... 2.5K, 1.5K, 600, 150, 50 Ohms
Instrument Input Connector ..... ¼" TS
Instrument Input Impedance ..... 1 Meg Ohm
Send Connector ..... 1/4" TRS Balanced/Unbalanced
Send Output Impedance ..... 51 Ohms
Return Connector ..... 1/4"TRS Balanced/Unbalanced
Return Input Impedance ..... 10K Ohms
Metering (3-LED) ..... -20dBu, 0dBu, Clip
Line input (switchable) ..... ¼" TRS, 10k Ohm Input Impedance
Phantom Power (switchable) ..... +48V (Pin 1, Pin 2 XLR)
Pad (switchable) 0dB/-20dB
Phase (switchable) 0, 180º
Hi-pass Filter (switchable) ..... -3dB shelf at 80Hz

Compressor

Threshold (variable) ..... -40dBu to +20dBu
Ratio (variable) ..... 1-10 (1:1 – 2:1)
Attack (variable) ..... 0.1 – 200ms
Release (variable) ..... 0.05 – 3 S
Output Attenuation/Gain ..... -20dB to +20dB

High Pass Sidechain Filter (variable) ..... 10Hz to 10kHz
Metering ..... Analog VU (Gain Reduction/Output Level)

Equalizer

Low Band (+/-10dB)..... 20Hz – 300Hz
Mid Band (+/-10dB)..... 200Hz to 3kHz
High Band)+/- 10dB) ..... 2kHz – 20kHz
Q (variable all bands)..... Q=0.4 to 2 (3 octave to 2/3 octave)

Master

Output Fader ..... -70dB to + 10dB
Output Connectors..... XLR Balanced and 1/4" TRS Balanced/Unbalanced
Output Impedance..... 51Ohms
Metering (Output level) ..... Analog VU (-20dBu – +6dBu)
Metering (Gain reduction) ..... Analog VU (-20dB – 0dB)
Output Headroom..... +22dBu

Physical

Power Supply ..... Internally Regulated Linear Type
Power Requirements (factory configure)..... 100-120VAC, 200-240VAC
Size ..... 1U Rack (19" x 1.75" x 7")
Weight..... 8 lbs.

As a commitment to constant improvement, PreSonus Audio Electronics, Inc. reserves the right to change any specification stated herein at any time in the future without notification.