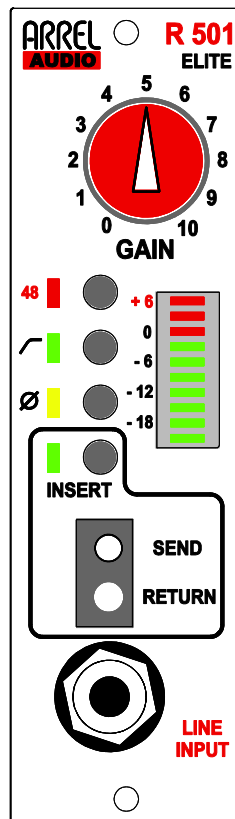# ARREL AUDIO

REAL Innovation

R–501 Elite
Mic-Line Preamplifier

User Manual

Issue 0.2

SAFETY INSTRUCTIONS

⚠ *WARNING*

Always follow the precautions listed below to avoid any possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not expose the instrument to liquids and rain. Do not use it near water or in damp or wet conditions, or place containers on it containing liquids. If any liquid seeps turn off the power and unplug the power cord from the AC outlet.
- Do not put burning items, such as candles, on the unit. A burning item may fall over and cause a fire.
- This instrument contains no user-serviceable parts. Do not open the instrument or attempt to disassemble or modify the internal circuit.
- Never insert or remove an electric plug with wet hands.
- Check the electric plug periodically and remove any dirt or dust which may have accumulated on it.
- Do not place the power cord near heat sources such as heaters or radiators, and do not excessively bend or otherwise damage the cord, place heavy objects on it, or place it in a position where anyone could walk on, trip over, or roll anything over it.

⚠ *CAUTION*

Always follow the precautions listed below to avoid any possibility of serious injury or even death from electrical shock, short-circuiting, damages, fire or other hazards. These precautions include, but are not limited to, the following:

- Do not connect the instrument to an electrical outlet using a multiple-connector. Doing so can result in lower sound quality, or possibly cause overheating in the outlet itself.
- When removing the electric plug from the instrument or an outlet, hold the plug itself and not the cord. Pulling by the cord can damage it.
- Remove the electric plug from the outlet when the instrument is not to be used for extended periods of time, or during electrical storms.
- Do not place the instrument in an unstable position where it might accidentally fall over.
- Before moving the instrument, remove all connected cables.
- When setting up the product, make sure that the AC outlet you are using is easily accessible. If some trouble or malfunction occurs, immediately turn off the power switch and disconnect the plug from the outlet. Even when the power switch is turned off, electricity is still flowing to the product at the minimum level.
- When you are not using the product for a long time, make sure to unplug the power cord from the wall AC outlet.
- Use only the stand/rack specified for the instrument. When attaching the stand or rack, use the provided screws only. Failure to do so could cause damage to the internal components or result in the instrument falling over.

▮▮▮▮ Information for Users on Collection and Disposal of Old Equipment

This special symbol on the products, packaging, and/or accompanying documents means that used electrical and electronic products should not be mixed with general household waste.
For proper treatment, recovery and recycling of old products, please take them to applicable collection points, in accordance with your national legislation and the Directives 2002/96/EC.
By disposing of these products correctly, you will help to save valuable resources and prevent any potential negative effects on human health and the environment which could otherwise arise from inappropriate waste handling.
For more information about collection and recycling of old products, please contact your local municipality, your waste disposal service or the point of sale where you purchased the items.
[For business users in the European Union]
If you wish to discard electrical and electronic equipment, please contact your dealer or supplier for further information.
[Information on Disposal in other Countries outside the European Union]
This symbol is only valid in the European Union. If you wish to discard these items, please contact your local authorities or dealer and ask for the correct method of disposal.

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ARREL Audio is continuously working to the improvement of its systems and related documentation.
In any case, we reserve the right to change the specifications without notice but in the respect to the current legislation.

Disclaimer:
The information contained in this manual has been carefully checked and we believed is accurate at the time of publication.
In any case, we do not assume any responsibility for inaccuracies, errors or omissions nor any liability for any loss or damage resulting either directly or indirectly from use of the information contained in this manual.

TABLE OF CONTENTS

INTRODUCTION

ARREL Audio R-501 Elite Mic-Line Preamplifier has been conceived to offer to the 500 series user the superior audio performance of the ARREL audio higher level product lines. The unit offers to the 500 user high reliability, rugged design, outstanding audio quality, versatility and ease of use typical of the tradition of ARREL Audio products. **R-501 Elite** is perfect for recording every kind of music from classic, pop/rock, electronic and in all the situations (live and recording studio) where maximum sound quality and special attention to dynamic range and signal to noise ratio is needed.

The **R-501 Elite** technical specification shows that it is the perfect audio unit also for actual digital recording 24bit/192kHz environments where superior performance is required.

R-501 Elite is based on the use of the latest circuit topologies, characterized by very low distortion, ultra-low noise and very wide frequency response. The amplifier architecture is based on two high dynamic range gain stages in order to avoid any saturation.

Even if the input stage of the **R-501 Elite** could accept input signals up to +24 dBu, a special protection circuit limits the input level at +20 dBu in order to prevent any damage. The **R-501 Elite** extended input dynamic range **avoids the necessity of the input pad** and the gain is controlled by a single large knob. The absence of the input pad means better sonic performances. In fact the pad degrades sound quality and affects signal to noise ratio.

The **R-501 Elite** contains a special circuit that allows the connection of microphones even if the unit is turned on with the Phantom Power activated (in any case we do not recommend this practice in order to protect your microphones).

The R-501 Elite differently from the traditional series 500 modules (powered at +/-16 VDC) is powered at the normal 500 series voltage but the power supply is internally increased at +/-24 VDC providing +32 dBu maximum output level.

The Line Input (unbalanced) is easily accessible from the front panel by a 1/4"' TRS jack, the jack insertion excludes the mic input. If a balanced line is connected to the Line Input, it will be automatically unbalanced (cold connected to ground).

The two bantam connectors on the front panel provide an insert point (push button) that is extremely useful permitting the "on the fly" connection of out-board units without accessing the back panel.

To obtain an outstanding audio quality, no servo amplifiers are used in the **R-501 Elite** so

<p style="color:red; text-align:center;">**IT IS NOT POSSIBLE TO UNBALANCE THE LINE-OUT OF THE R-501 Elite.**</p>

If you need an unbalanced connection for the line out follow the indications shown in APPENDIX A.

Four illuminated buttons are provided for Phantom Power, Phase inversion, LO-CUT filtering and Insert control.

A LED bargraph (10 LEDs) is used to display the output level.

The **R-501 Elite,** offers a milk white-painted (RAL 9001) front panel and a semi closed enclosure and has been designed to be compliant with the 500-series standard. **R-501 Elite** is dedicated (due to his absolute sonic level quality) to high professional vocal recordings, classical instruments, high dynamic range instruments such as drums and percussions. **ARREL Audio** products are designed and manufactured in Italy.

Housing

The R-501 Elite Mic-Line Preamp Module has been designed to be compliant with the 500-series standard.

Installation Instructions

➢ Remove the R-501 Elite module from the packaging.

➢ Turn off the 500-series enclosure and remove mains power.

➢ Find an empty slot in the 500-series rack and remove the 2 fastening screws, positioned one on the top of the enclosure and one the bottom of the enclosure.

➢ Insert the R-501 Elite into the empty slot in the 500-series enclosure, Be sure that the rear edge connector on the R-501 Elite module mates correctly with the edge connector of the 500-series enclosure.

➢ Replace the 2 fastening screws through the top & bottom holes in the R-501 Elite module and screw into the 500-series enclosure. The module must be secured into the enclosure before turning the mains on.

➢ Apply mains power into the 500-series enclosure and turn on.

➢ Connect the microphone, audio source or instrument and select the correct settings.

➢ The module is not designed to be hot-plugged, so please ensure the power to the 500-series enclosure is OFF before inserting or removing a module (this recommendation is useful in order to protect the 500 enclosure circuits, our product due to a very robust construction could be hot-plugged without problems).
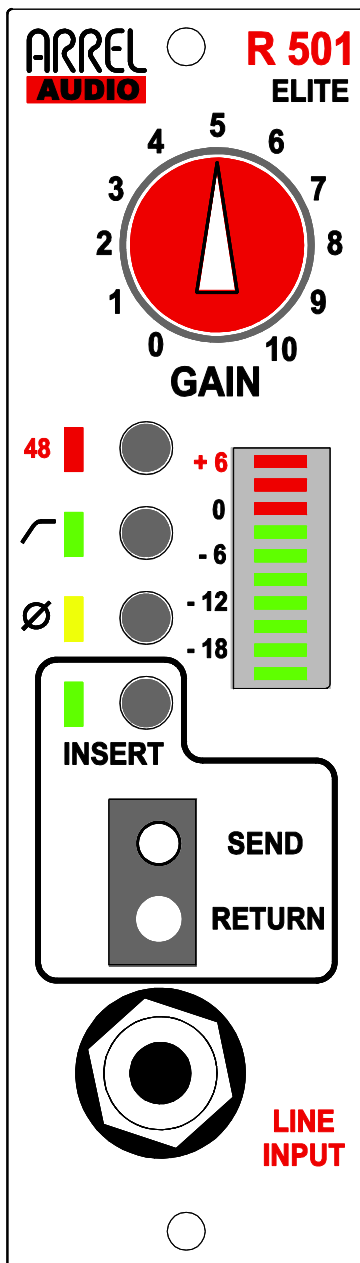
R-501 Elite Front Panel Controls and Operations

INPUT SOURCE SELECTION

The R-501 Elite input stage is based on a differential amplifier so it is "electronically balanced".

If the Line-In 1/4" jack is not inserted on the housing on the front panel the mic input is activated, the insertion of the Line In jack disconnects the mic input. Due to its very high dynamic range, the ARREL Audio R-501 ELITE **does not require any input pad** switch.

PHANTOM-POWER SWITCH

Press the button to activate the +48 V Phantom Power (LED on). To deselect the Phantom Power press again the button (LED off).

A special circuit allows the connection of microphones even if the unit is turned on with the Phantom Power activated.

GAIN CONTROL KNOB

Turn the gain knob in order to select the required amount of gain for either the mic input or the Line input.

The gain range if the mic input is activated is 70 dB. If Line input is activated the range is 30 dB.

LO-CUT SWITCH

Push the button to activate the high pass filter (LED on). The filter cut-off frequency is 80 Hz with 12 dB / Oct. slope. Press again to switch off the filter (LED on).

PHASE SWITCH

Push the button to invert the phase of the audio signal by 180 degrees (LED on). Press again to switch off the phase inversion (LED off).

LEVEL INDICATOR

The output level Indicator is based on a 10-LED Bargraph (7 x green LEDs and 3 x red LEDs) that measures in the range +6/-21 dBu, The resolution in 1.5 dB per step.

ARREL Audio

SEND/RETURN BANTAM JACKS

The front panel SEND/RETURN bantam jacks permit the insertion of an outboard in series to the output without changing the connections on the back panel. The SEND/RETURN is a balanced connection. This feature is extremely useful if you want to add on the fly outboards.
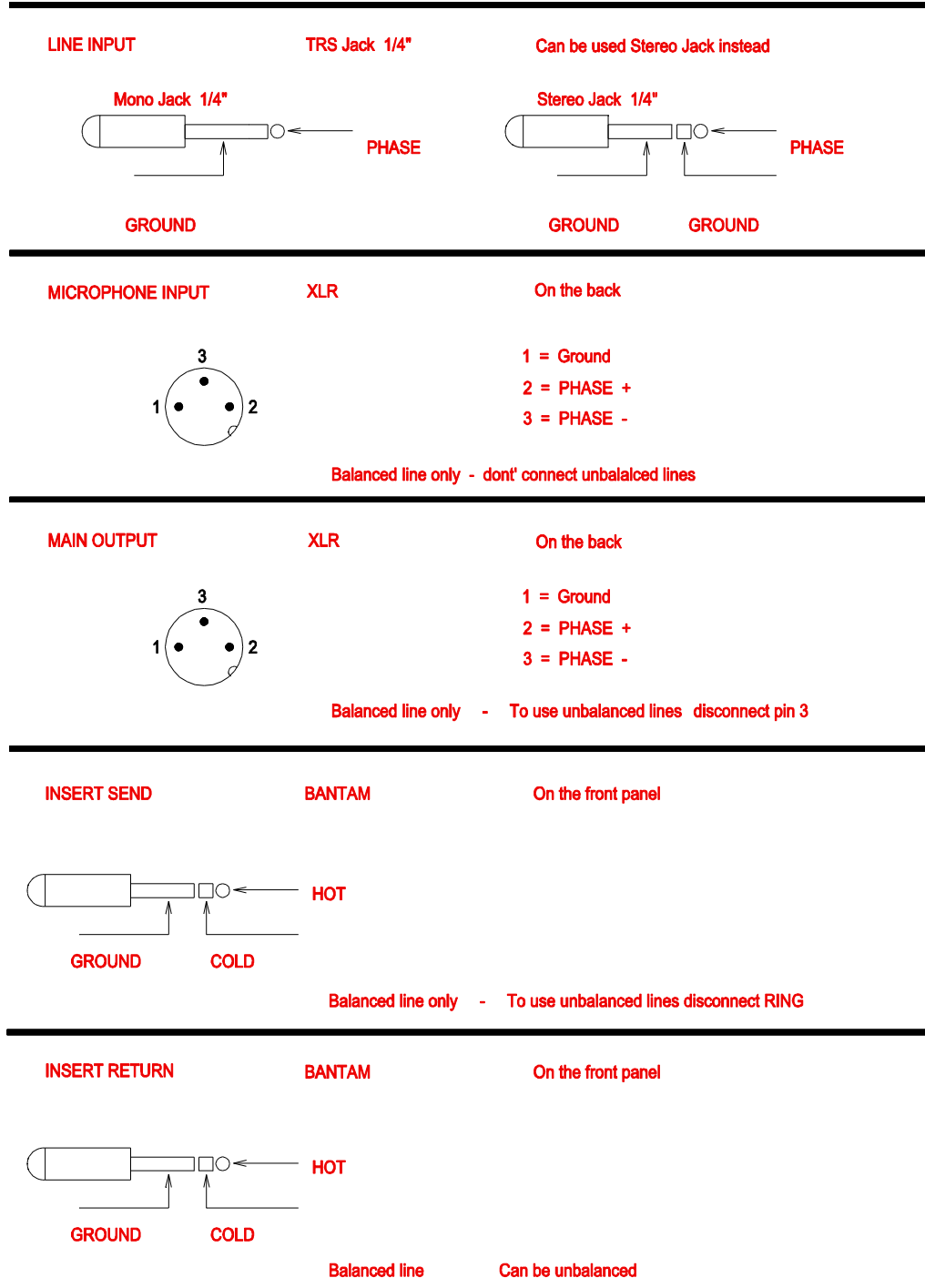
APPENDIX A: Connections

GROUND front panel

LINE INPUT   TRS Jack 1/4"   Can be used Stereo Jack instead

Mono Jack 1/4"   Stereo Jack 1/4"

PHASE   PHASE

GROUND   GROUND   GROUND

MICROPHONE INPUT   XLR   On the back

1 = Ground
2 = PHASE +
3 = PHASE -

Balanced line only - dont' connect unbalalced lines

MAIN OUTPUT   XLR   On the back

1 = Ground
2 = PHASE +
3 = PHASE -

Balanced line only - To use unbalanced lines disconnect pin 3

INSERT SEND   BANTAM   On the front panel

HOT

GROUND   COLD

Balanced line only - To use unbalanced lines disconnect RING

INSERT RETURN   BANTAM   On the front panel

HOT

GROUND   COLD

Balanced line   Can be unbalanced

FIG. 1 R-501 ELITE Connections

APPENDIX B: 500 series module edge connector

R - 500
MODULE

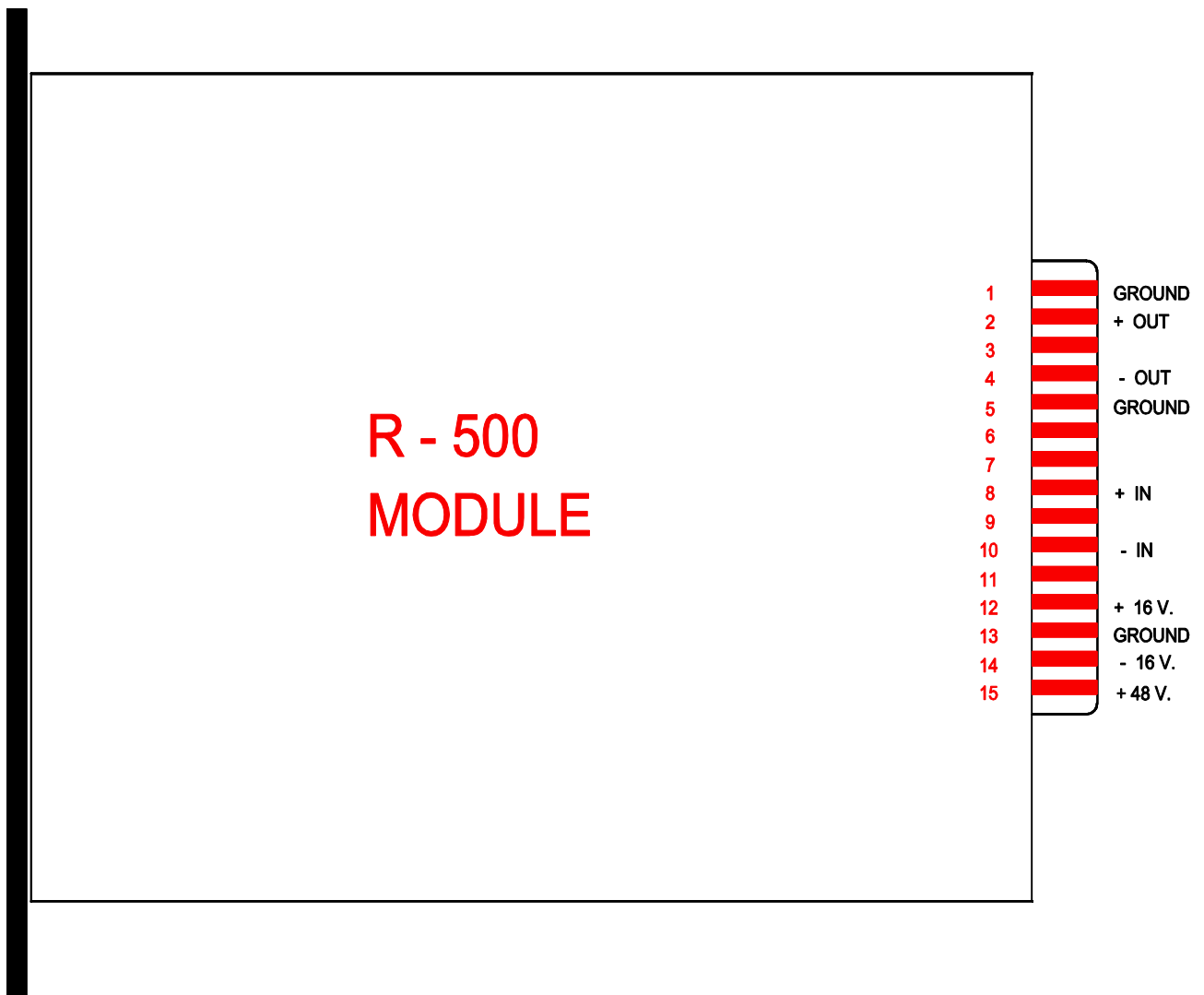|	
1	GROUND
2	+ OUT
3	
4	- OUT
5	GROUND
6	
7	
8	+ IN
9	
10	- IN
11	
12	+ 16 V.
13	GROUND
14	- 16 V.
15	+ 48 V.

FIG. 2 500 Series module edge connector

APPENDIX C: Front Panel
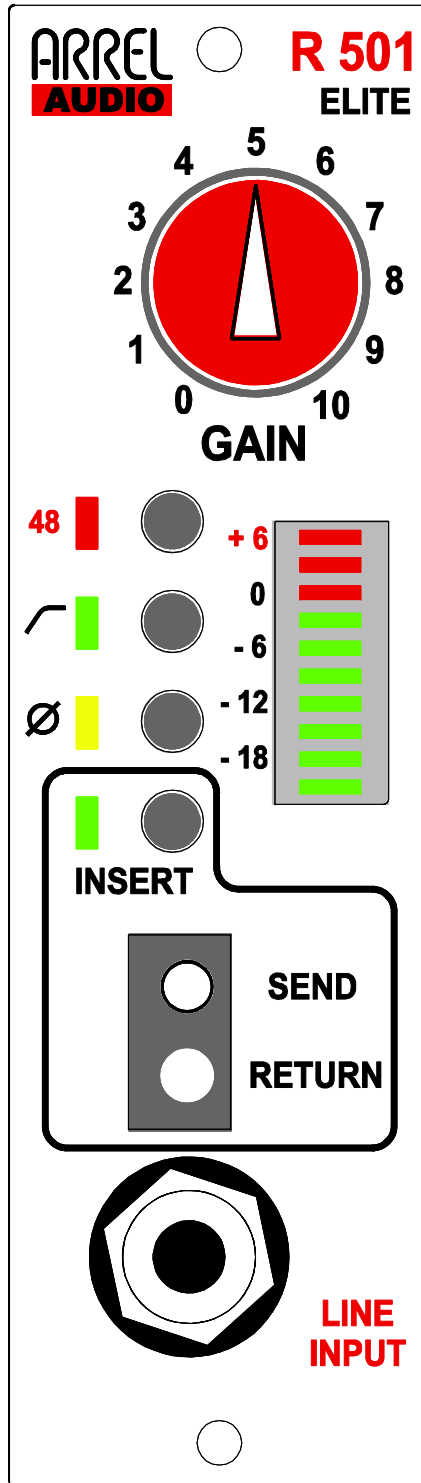
FIG. 3 R-501 Elite Front Panel

TECHNICAL SPECIFICATIONS

Number of Channels:	1
Power Supply	± 16V converted to ± 24 V DC (a special circuit increase the 500 power supply to ± 24 V), 48 V DC, very low power supply currents with respect to the 500 series standard
Microphone Input	Electronically Balanced, Phantom Power switch (LED), Input Level +4 dBu/-66 dBu, Max input level +24 dBu, Input Impedance 4 KΩ
Microphone Gain	70 dB range
Line Input	Unbalanced, Impedance 47 KΩ, Line level -4/-34 dBu, Max +20 dBu.
Line Gain	30 dB range
Bandwidth	5 - 150 KHz ± 1 dB, perfect square wave up to 20 KHz
Distortion + Noise	<0.003% (typical 0.001%).
Low Cut Filter	80 Hz. 12 dB /Oct., selected by a button (LED)
Output Level	Electronically Balanced, Level +4 dBu, Max +32 dBu.
Front Panel Controls	48V Phantom Power button, Lo-Cut button, Phase Reverse button.
Front Panel Input Connectors	1/4” TRS jack, Line-Mic switch by line jack insertion Send and Return Balanced Bantam Jacks
Front Panel Indicators	Level Indicator 10-LED Bargraph (7x green, 3x red), 1.5 dB step, Range +6/-21 dBu, 4 LEDs (48V Phantom Power, Lo-Cut, Phase, Insert).
Rear Panel Input Connectors	Series 500 compatible connector
Construction	Compliant 500-series rack with PSU and external audio connections, Single 500-series rack slot required for each R-501 ELITE module.
Dimensions	Series 500 compatible module
Weight	500 g