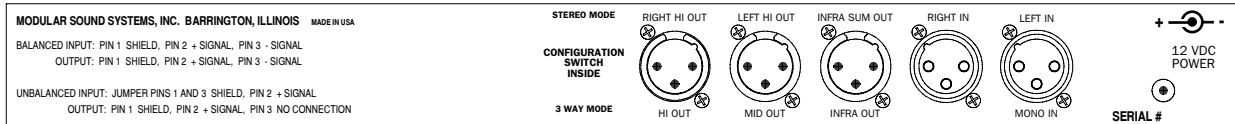
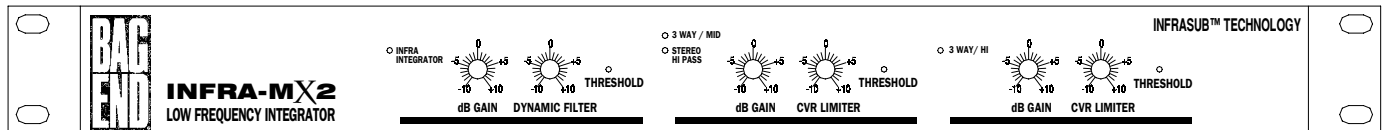


BAG END

INFRA - MX2

S P E C I F I C A T I O N S



GENERAL SPECIFICATIONS

Input Connectors:
XLR female

Input Configuration:
Balanced

Alternate Input Configuration:
Unbalanced

Maximum Input Signal:
5 V (+16 dBu)

Output Connectors:
XLR male

Output Configuration:
Unbalanced

Maximum Output Signal:
3 V (+10 dBu)

Nominal Output Impedance:
100 Ω

Minimum Suggested Load Impedance:
2.5 k Ω

Power-on Indication:
Green LED

Operating Input Voltage:
12 - 15 VDC

Operating Current Required:
200 mA

Input Voltage Connector:
Miniature DC 2.5 mm

Input Voltage Polarity:
Center pin +

INFRA SPECIFICATIONS

Maximum INFRA Gain:
10 dB

Maximum INFRA Attenuation:
10 dB

INFRA Cutoff Frequency Programming:
Plug in resistors

INFRA Cutoff Frequency:
8 Hz to 40 Hz
Factory default 18 Hz

INFRA Output Mode:
Sum in Stereo Mode

Nominal Dynamic Filter Threshold: 0 dBu Output

Minimum Dynamic Filter Threshold:
-10 dBu Output

Maximum Dynamic Filter Threshold: +10 dBu Output

Maximum Dynamic Filter Reduction Capability at 18Hz:
30 dB

Dynamic Filter Threshold Exceeded Indication:
Red LED

INFRA Circuit Noise:
< -90 dBu (20 Hz to 20 kHz)

INFRA Dynamic Range:
> 105 dB (20 Hz to 20 kHz)
(bandwidth unweighted)

INFRA Output:
Use with Infrasub™ or INFRA™ type loudspeakers only.

HI PASS SPECIFICATIONS

Maximum Hi Pass Gain:
10 dB

Maximum Hi Pass Attenuation:
10 dB

Hi Pass Filter Frequency Programming:
Plug in resistors

Factory Set Hi Pass Filter Frequency:
-3 dB @ 130 Hz / -6 dB @ 97 Hz

Hi Pass Filter Frequency Range:
50 Hz to 200 Hz

Hi Pass Filter Slope:
12 dB/octave

Hi Pass Circuit Noise:
< -90 dBu (20 Hz to 20 kHz)

Hi Pass Dynamic Range:
> 105 dB (20 Hz to 20 kHz)
(bandwidth unweighted)

PHYSICAL SPECIFICATIONS

Enclosure:
Black powder coated steel

Enclosure Mounting:
1U EIA rack (1.75")

Dimensions:
1.75"h x 19"w x 5.25"d
5 cm x 49 cm x 14 cm

Weight:
5 lbs., 2.3 kg

Shipping Dimensions:
6" x 22" x 12"
16 cm x 59 cm x 31 cm

Shipping Weight:
7 lbs., 3.2 kg

Applications:

Portable Sound Systems
Cinema Reproduction
Auditorium Sound Systems
Church Sound Systems
Theatrical Production
Nightclub Applications
Musical Instrument Systems

Description: The Bag End INFRA-MX2 system module is a two channel loudspeaker controller. It is designed for either stereo 2-way operation with a mono sum INFRA low frequency output or mono 3-way operation. The INFRA-MX2 incorporates the INFRA dual integrator, frequency dividing, and system protection in an easily operated configuration where the system parameters are internally preset or available on front panel rotary controls.

Use INFRA™ output with Bag End Infra loudspeakers only.

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INFRA-MX2

General: Upon detailed evaluation and analysis of an INFRA system, it is clear that the fundamental impression of power and impact is greater with an INFRA system when compared to conventional bass systems. This is true even when the two systems will measure the exact same calibrated dB sound pressure level. We believe this is because an INFRA system compacts the bass energy into a tight packet aligned with the upper range signal rather than the typical time smears inherent in conventional bass systems. Objectively, the INFRA system exhibits superior phase response and low group delay.

The front panel controls are uniformly calibrated in even dB increments with a 20 dB control range and are flush mounted so that the control settings are not accidentally changed.

The INFRA-MX2 operates on 12 Volt DC which insures complete international compatibility and easily allows custom portable and automotive applications.

The INFRA-MX2 requires no connection to the output of the amplifier. To set the Dynamic Filter and CVR Limiter protection thresholds, refer to the amplifiers input sensitivity and adjust the front panel controls accordingly.

Dynamic Filter: The Dynamic Filter circuit is a complimentary technology to the INFRA. Set to the proper threshold, it insures that unexpectedly large signals will not overload the system resulting in possible damage or audible distortion. This allows high level operation close to the maximum system capabilities without fear of accidental overload. The Dynamic Filter is not a band limiter. It dynamically reduces the low frequency extension.

Hi Pass: The Infra-MX2 includes a stereo Hi Pass section for each channel. This section provides a very low noise unity gain Hi Pass filter frequency is factory set to -3dB at 130 Hertz. This makes the -6dB point of 95 Hertz the standard factory set crossover frequency. This setting will be correct for most applications. The frequency can be changed for special application by changing internal socketed resistors.

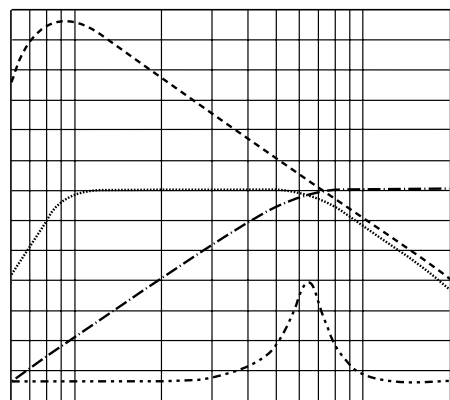
CVR Limiter: The Continuous Variable Recovery limiter provides a limiting circuit with a high level of system protection and very minimal audible effects. The CVR circuit provides a fast attack time with a variable recovery time dependent upon the amount of limiting originally called for. In operation, it resembles a human operator who corrects large level changes rapidly, but carefully, and slowly returns the gain to full, anticipating that if reduction was needed then the gain shouldn't be rushed back to full, as it is likely that another reduction is necessary.

Polarity: The INFRA and Hi pass polarity in the INFRA-MX2 have been internally set for proper crossover functions. A simple polarity tester may show reversed polarity as referenced to DC. In audio, we listen to AC signals and the best actual polarity determination is made at the crossover point with an asymmetrical signal. Under these conditions, the INFRA-MX2 will exhibit the correct polarity at crossover and provide the most even blend between the upper range system and the INFRA speakers. Reversing the INFRA polarity will add energy in the upper bass region near crossover and may mask the lower bass output.

What is INFRASUB™ technology?

Infrasub is Bag End's second generation dual integrator bass extension technology. Utilizing Surface Mount Technology, the Infrasub technology provides improvements over earlier dual integrators through modern manufacturing. The extended low frequency approach insures that the lowest 3 octaves of the audio and sensory spectrum are reproduced acoustically in the same time and frequency relationship as the electrical input to the system.

A fundamentally new approach to low frequency reproduction, the INFRA™ employs electronic compensation to the uniform response that a sealed box loudspeaker system exhibits below its resonance frequency. The resultant frequency response can be extended well below the audible range while at the same time greatly reducing the influence of the system resonance. An INFRA™ system reproduces each note with precision and uniformity while maintaining a flat frequency and phase response, eliminating the tendency to emphasize the notes around resonance as in conventional bass systems. The enhanced INFRA™ dual integrator provides both a very flat response below resonance and the high frequency roll-off above resonance, for crossover to the midrange driver, without the use of conventional low pass filters and the delay typically introduced by them. An inherent bonus of the process requires the enclosures to be small. For example, a double 10-inch INFRA™ system measures only 13" x 22" x 13" (1.5 ft³).



6 Hz 200 Hz
----- Electrical frequency response of the INFRA™ dual integrator
..... Acoustical output of the INFRA™ system
- · - · - Acoustical frequency response of the INFRA™ loudspeaker in a sealed box
- - - - Impedance amplitude of INFRA™ loudspeaker in a sealed box

INFRA-MX2

MODE - Stereo 2 WAY / MONO 3 WAY

The Infra-MX2 is normally shipped as configured in the stereo 2-way mode. To change unit to mono 3-way mode change the 7 jumpers inside the unit. 4 jumpers are located on the front control circuit board and 3 jumpers are located on the main circuit board. Move all 7 jumpers from S to M (Stereo to Mono) to reconfigure unit for mono 3-way mode.

INFRA-MX2 FILTER FREQUENCY PROGRAMMING

To change the INFRA cutoff frequency and the hi pass frequency you may replace the indicated resistors. The replaceable resistors are mounted in plug in sockets and no soldering is required. Each resistor has a specific K factor number associated with it which is to be divided by the filter frequency selected. The filter frequency is specified as the -3dB point. This is the standard way of specifying filter frequencies but should not be confused with the actual crossover frequency of the loudspeaker system. (The actual crossover frequency is at the -6dB point which may be calculated

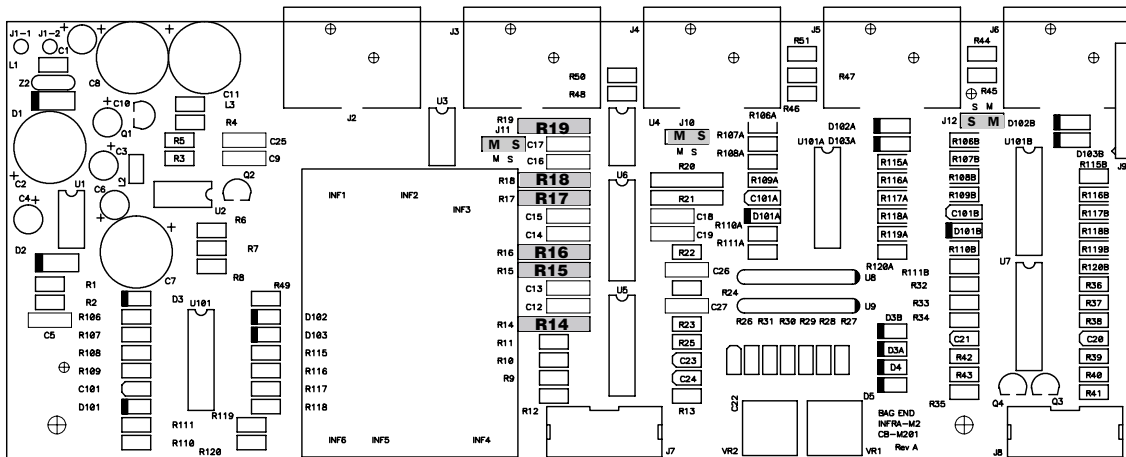
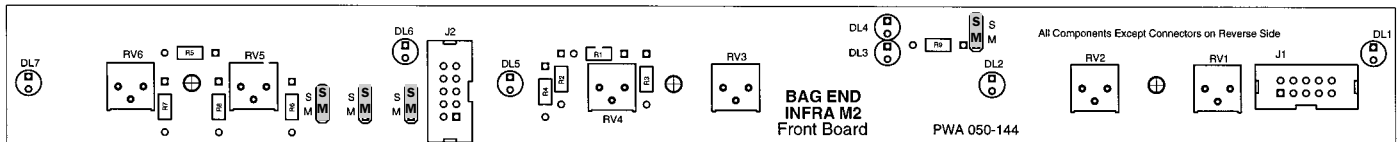
for the hi-pass by multiplying the -3dB frequency by .75, and for the low-pass by multiplying by 1.33) The result of this calculation will equal the value of the resistor in K ohms.

For example: The factory set value for the normal stereo Hi pass section is 130 Hz. R19 is part of the Hi pass filter and has a factor number of 11,250.

Simply divide the factor, 11250 by the frequency selected, 130 and this equals the resistor value in K ohms, 86.5 K ohms or $11250/130 = 86.5$.

Each filter has two sections with two resistors with different K factor numbers. Both resistors must be calculated correctly to achieve a proper filter frequency and slope.

The procedure is to divide the K factor by the desired cutoff frequency in Hertz to find the resistor value in K ohms, and chooses the nearest standard value. For all practical purposes, you can choose the nearest 5% tolerance value and achieve very good results.



INFRA-Cutoff Frequency:

For R14: divide 682 by frequency
Factory value is 18.5 Hertz / 36.5 K Ohms
($682 / 18.5 = 36.8$)

For R15: divide 341 by frequency
Factory value is 18.5 Hertz / 18.2 K Ohms
($341 / 18.5 = 18.4$)

Hi-Pass Frequency for Hi-Freq output Right Channel (and Hi output of INFRA-MX2 in three-way mode):

For R16: divide 11250 by frequency
Factory value is 130 Hertz / 86.6 K Ohms
($11250 / 130 = 86.5$)

For R17: divide 22500 by frequency
Factory value is 130 Hertz / 174 K Ohms
($22500 / 130 = 173$)

Hi-Pass Frequency for Hi-Freq output Left Channel (and Mid output of INFRA-MX2 in three-way mode):

For R18: divide 22500 by frequency
Factory value is 130 Hertz / 174 K Ohms
($22500 / 130 = 173$)

For R19: divide 11250 by frequency
Factory value is 130 Hertz / 86.6 K Ohms
($11250 / 130 = 86.5$)

Low-Pass Frequency for Mid output (INFRA-MX2 only):

For R20: divide 53990 by frequency
Factory value is 2000 Hertz / 27.4 K Ohms
($53990 / 2000 = 27$)

For R21: divide 14220 by frequency
Factory value is 2000 Hertz / 7.11 K Ohms
($14220 / 2000 = 7.11$)