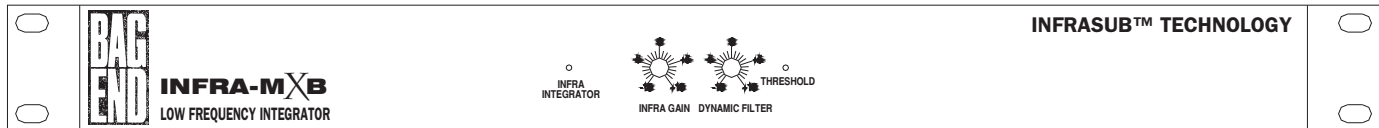


BAG END

INFRA - MXB

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



MODULAR SOUND SYSTEMS, INC. ALGONQUIN, ILLINOIS
MADE IN U.S.A.

BALANCED INPUT: PIN 1 SHIELD, PIN 2 +SIGNAL, PIN 3 -SIGNAL
OUTPUT: PIN 1 SHIELD, PIN 2 +SIGNAL, PIN 3 -SIGNAL

UNBALANCED INPUT: JUMPER PINS 1 AND 3 SHIELD, PIN 2 +SIGNAL
OUTPUT: PIN 1 SHIELD, PIN 2 +SIGNAL, PIN 3 NO CONNECTION

The diagrams show five circular terminal blocks with three pins each, labeled 'RIGHT HI OUT', 'LEFT HI OUT', 'INFRA SUM OUT', 'RIGHT IN', and 'LEFT IN'. A separate terminal block is labeled '12 VDC POWER'.

GENERAL SPECIFICATIONS

Input Connectors:
XLR female

Maximum Input Signal:
4.5 V (+16 dBu)

Output Connectors:
XLR male

Maximum Output Signal:
4.5 V (+16 dBm)

Balanced In/balanced out:
+6dB gain

Balanced in/unbalanced out
Unity gain

Unbalanced in/balanced out:
Unity gain

Unbalanced in/unbalanced out:
Unity gain

Output Impedance:
< 50 Ohms

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:
< -90dBu (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

Hi Pass Gain: Unity

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:

Recording Studios
Film Post Production
Video Editing Suites
Mastering Labs
Theatrical Production
Cinema Reproduction
Home Theater Systems
Stadiums and Arenas
Concert Sound Reinforcement
Musical Instrument Systems

Description: The Bag End INFRA-MXB system module is a two-channel loudspeaker controller designed for stereo 2-way operation with a mono sum INFRA low frequency output. The INFRA-MXB 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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60102 USA
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INFRA-MXB

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

The INFRA-MXB requires no connection to the output of the amplifier. To set the Dynamic Filter protection threshold, refer to the amplifiers input sensitivity and adjust the front panel control 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 automatically reduces the low frequency extension and leaves the rest of the bass unaffected.

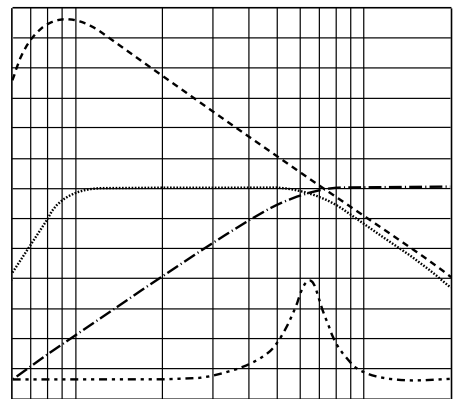
Hi Pass: The Infra-MXB includes a stereo Hi pass section for each channel. This section provides a very low noise unity gain Hi pass filter factory set to roll off at 12dB per octave. The filter frequency is factory set to -3dB at 130 Hertz. This makes the -6dB point of 95 Hertz the standard factory set crossover frequency. This setting will be correct for most applications. The frequency can be changed for special application by changing internal socketed resistors.

Polarity: The INFRA and Hi pass polarity in the INFRA-MXB 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-MXB 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-MXB

INFRA-MXB 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.

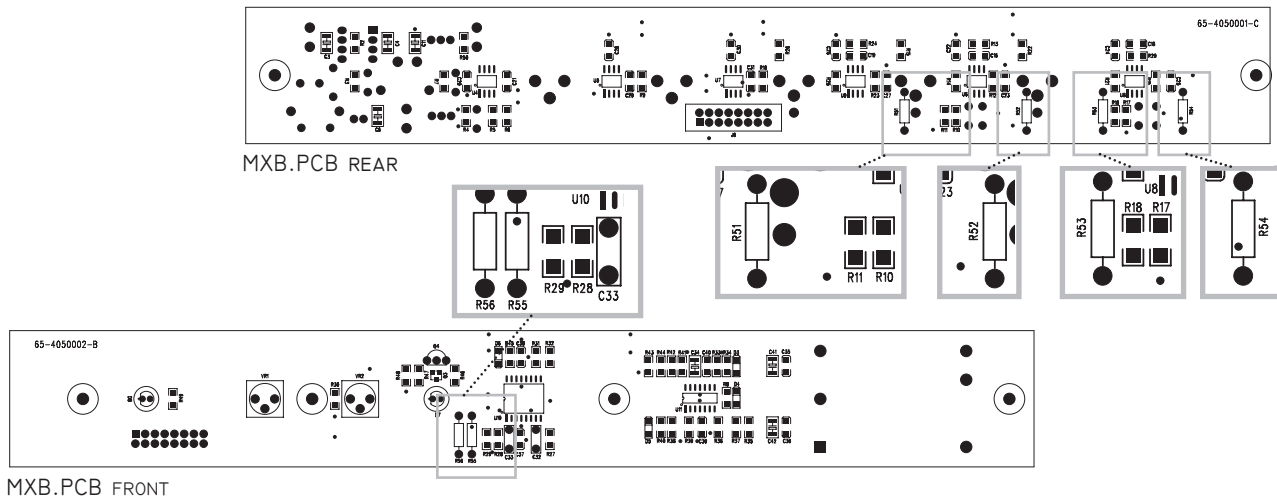
For example:

The factory set value for the normal stereo Hi Pass section is 130 Hz. R51 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 choose 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 R55: divide 341 by frequency
Factory value is 18.5 Hertz / 18.2 K Ohms
($341 / 18.5 = 18.4$)

For R56: divide 682 by frequency
Factory value is 18.5 Hertz / 36.5 K Ohms
($682 / 18.5 = 36.8$)

Hi-Pass Frequency for Hi-Freq output Right Channel

For R53: divide 11250 by frequency
Factory value is 130 Hertz / 86.6 K Ohms
($11250 / 130 = 86.5$)

For R54: divide 22500 by frequency
Factory value is 130 Hertz / 174 K Ohms
($22500 / 130 = 173$)

Hi-Pass Frequency for Hi-Freq output Left Channel

For R52: divide 22500 by frequency
Factory value is 130 Hertz / 174 K Ohms
($22500 / 130 = 173$)

For R51: divide 11250 by frequency
Factory value is 130 Hertz / 86.6 K Ohms
($11250 / 130 = 86.5$)

Remove the surface mount resistors R10, R11, R17 & R18. These are to the right of R51 and R53 as shown on above (rear).

Remove surface mount resistors R26 and R28, which are to the right of R55 and R56, as shown on above (front).