CITRONIC®

AX-4-B

170.931UK

Introduction

Thank you for purchasing this high quality Citronic crossover product. The aim of our audio processing range is to offer cost-effective, high performance sound sculpting tools for live sound reinforcement and installation applications. Citronic crossover units are set out in a familiar format with a comprehensive range of controls for trouble-free use.

The AX-4-B can operate as either a 2-way stereo crossover with 2 low frequency outputs and 2 mid/high frequency outputs or a 3-way stereo crossover with separate low, mid and high frequency outputs. Also, the unit may be configured as a 4-way mono crossover with a separate low, low-mid, high-mid and high frequency output. Accurate state-variable Linkwitz-Riley filters provide smooth and accurate frequency division without severe peaks or dips at the crossover points. A low cut filter may be switched in to cut very low frequencies which are inefficient and potentially damaging for the amplifier.

Connection to the crossover is via balanced or unbalanced XLR connectors allowing flexible linking options.

This unit has been built to Citronic's exacting standards using high grade circuit boards and components housed in a heavy duty steel chassis casing to give long term, reliable service.

Installation

Set the crossover into a 1U space in a rack, ensuring enough depth to contain the unit and any connectors attached to it. Secure the front panel with rack screws and nuts to hold in place and stop the unit slipping. Plug the included power cable into the rear panel IEC connector and connect to the mains. Be sure to switch the crossover on before switching on the power amplifiers to avoid loud thumping sounds through the speakers and switch the amplifiers off before switching off the crossover. The unit draws relatively little current and it is recommended to be left powered whilst in the audio chain as switching can cause loud thumping sounds through the speakers.

This crossover will not require special venting requirements as there is little heat generated compared to amps etc. However, performance of this product may be impaired by exposure to continuous high temperatures generated by adjacent equipment. Also, this unit is very well shielded against electromagnetic interference but high levels in close proximity should be avoided. Nevertheless, spacing in between high power amplifiers is recommended if possible.

Connection to each channel is served by XLR for both inputs and outputs.

For balanced connections, follow the table below.

Connection	XLR connector
Hot (+)	Pin 2
Cold (-)	Pin 3
Earth	Pin 1

For unbalanced connections, follow the table below.

Connection	XLR connector
Signal (Hot)	Pin 2
Earth (Cold)	Pin 1 + 3

Applications

A 2-way crossover is a device which divides the low and mid/high frequencies in a signal and delivers the low frequencies to the amplifier which drives the bass speaker cabinets and the mid/high frequencies to the amplifier which drives the mid/high cabinets. This type of system is known as “bi-amped” and is generally more efficient than a system using a single amp for all frequencies. Also, this type of frequency splitting before the amplifier stage is more accurate than passive crossovers used inside speaker cabinets to split frequencies after the amplifier stage.

A 3-way crossover goes a stage further by dividing the signal into low frequency, mid frequency and high frequency outputs to feed 3 separate amp and speaker arrays giving a “tri-amped” system. This is even more accurate and efficient than the “bi-amped” type and is largely used in high powered sound reinforcement applications.

The AX-4-B is also capable of being configured as a 4-way mono crossover, dividing the frequencies into low, low-mid, high-mid and high outputs for a monaural “quad-amped” system. When using the AX-4-B in mono mode, refer to the upper labelling on the rear panel.

The particular mode required is selected by push switches on the rear panel and is indicated by 3 LEDs on the front panel. Outputs are labelled with respect to each of the 3 modes on the rear panel. The modes are indicated on the left to show which labelling is relevant.

Each output can be phase reversed to help with speaker time alignment where the bass speakers might give frequencies which cancel out those of the mid-high speakers. This can also be a result of face-to-face placement of cabinets. These are mechanical switches and should only be operated when the amplifiers are turned down or off. The low cut control is a low noise type and may be switched in or out at will.

The low frequency outputs can be summed (merged) to provide a mono output for a single bass speaker or to eliminate disparity of the output of more than one bass speaker. The low frequency sum is not usable in mono mode.

To further help with phase alignment of the very low frequencies, a delay control allows up to 2 milliseconds of delay to be applied to either or both of the low frequency outputs. This control is extremely fine-tuned to give accurate time-alignment.

Delivering specific frequencies to purpose-built speaker cabinets is not only more efficient but prevents harmful low frequencies reaching the mid-high cabinets.

Level controls for each output allow accurate balancing between frequency ranges and can be used to emphasize the low or high frequency element.

Should the crossover point need to be above 930Hz, the RANGE switch must be engaged which multiplies the frequency setting by a factor of 10 (so 250Hz would actually be 2.5kHz)

Operation

Front Panel

- POWER Switch – Turns on the mains to the unit
- INPUT Rotary – Boost or cut the input by up to 12dB
- LOW CUT Switch – A 25Hz low shelving filter
- XOVER FREQ. Rotary – Crossover frequency setting (Low/Mid, Mid/High or Low/High)
- DELAY – Up to 2ms delay on low frequency output
- GAIN Rotary – Low, Low-mid, Mid, Mid-high or High frequency output level
- Ø INV – Phase reverse switch
- HIGH OUTPUT Rotary – High frequency output level
- MODE LEDs – Indicates mono 4-way or stereo 2 or 3-way operation

Rear Panel

- XLR inputs for each channel – Input via XLR, balanced or unbalanced
- XLR outputs for each frequency range on each channel – Output via XLR, balanced or unbalanced
- x1, x10 Switch – Range switch for crossover frequency setting
- MODE Switches – Switches mono 4-way or stereo 2 or 3-way operation
- LOW SUM Switch – Merges both low frequency outputs to a single mono out
- IEC Connector – Connection to mains supply
- Voltage switch – 115/230V switch (Only for use dependent upon regional power supply)

Maintenance and Servicing

There are no user serviceable parts inside this unit. General case cleaning may be recommended using a dry or slightly damp cloth and connectors should be checked periodically for good electrical contact. Any attempt to open and modify or repair the circuitry of this unit will void the warranty. Refer all repair and servicing to qualified personnel and all warranty issues must be handled by the retailer where the unit was purchased.

Technical Specification

Model	AX-4-B
Format	Stereo 2-way or 3-way / Mono 4-way crossover
Frequency Response	20Hz – 20kHz +0, -0.5dB
Filter Type	34dB/octave Linkwitz-Riley state variable filters
Crossover Frequencies	44Hz – 9.3kHz in 2 ranges
Input Impedance	>50kΩ balanced, >25kΩ unbalanced
Maximum Input Level	+22dBu
Channel Crosstalk	92dBu – 95dBu
Maximum Output Level	+20dBu
Output Impedance	60Ω balanced, 30Ω unbalanced
THD	≤0.04%
SNR	>88dBu - >94dBu
Filter Switching	Low cut FET low noise type
Power	AC 240V, 18W