



User's Manual

X23


2-WAY STEREO/3-WAY MONO ACTIVE CROSSOVER




IMPORTANT SAFETY INSTRUCTION



TO REDUCE THE RISK OF ELECTRIC SHOCK PLEASE DO NOT REMOVE THE COVER OR THE BACK PANEL OF THIS EQUIPMENT. THERE ARE NO PARTS NEEDED BY USER INSIDE THE EQUIPMENT. FOR SERVICE, PLEASE CONTACT QUALIFIED SERVICE CENTERS.

 This symbol, wherever used, alerts you to the presence of un-insulated and dangerous voltages within the product enclosure. These are voltages that may be sufficient to constitute the risk of electric shock or death.


 This symbol, wherever used, alerts you to important operating and maintenance instructions. Please read.

- ⊕ Protective Ground Terminal
- ~ AC mains (Alternating Current)
- ⚡ Hazardous Live Terminal

ON: Denotes the product is turned on.
OFF: Denotes the product is turned off.

CAUTION

Describes precautions that should be observed to prevent damage to the product.


1. Read this Manual carefully before operation.
2. Keep this Manual in a safe place.
3. Be aware of all warnings reported with this symbol. 
4. Keep this Equipment away from water and moisture.
5. Clean it only with dry cloth. Do not use solvent or other chemicals.
6. Do not damp or cover any cooling opening. Install the equipment only in accordance with the Manufacturer's instructions.
7. Power Cords are designed for your safety. Do not remove Ground connections! If the plug does not fit your AC outlet, seek advice from a qualified electrician. Protect the power cord and plug from any physical stress to avoid risk of electric shock. Do not place heavy objects on the power cord. This could cause electric shock or fire.
8. Unplug this equipment when unused for long periods of time or during a storm.
9. Refer all service to qualified service personnel only. Do not perform any servicing other than those instructions contained within the User's Manual.
10. To prevent fire and damage to the product, use only the recommended fuse type as indicated in this manual. Do not short-circuit the fuse holder. Before replacing the fuse, make sure that the product is OFF and disconnected from the AC outlet.

WARNING

To reduce the risk of electric shock and fire, do not expose this equipment to moisture or rain.



Dispose of this product should not be placed in municipal waste and should be separate collection.

11. Move this Equipment only with a cart, stand, tripod, or bracket, specified by the manufacturer, or sold with the Equipment. When a cart is used, use caution when moving the cart / equipment combination to avoid possible injury from tip-over. 

12. Permanent hearing loss may be caused by exposure to \ extremely high noise levels. The US. Government's Occupational Safety and Health Administration (OSHA) has specified the permissible exposure to noise level. These are shown in the following chart:

HOURS X DAY	SPL	EXAMPLE
8	90	Small gig
6	92	train
4	95	Subway train
3	97	High level desktop monitors
2	100	Classic music concert
1,5	102	
1	105	
0,5	110	
0,25 or less	115	Rock concert

According to OSHA, an exposure to high SPL in excess of these limits may result in the loss of heat. To avoid the potential damage of heat, it is recommended that Personnel exposed to equipment capable of generating high SPL use hearing protection while such equipment is under operation.

The apparatus shall be connected to a mains socket outlet with a protective earthing connection.

The mains plug or an appliance coupler is used as the disconnect device, the disconnect device shall remain readily operable.

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1. INTRODUCTION

Thank you for your purchasing the ▲LTO products X23 Active Crossover.

It is just one of the many ▲LTO products that a talented, multinational Team of Audio Engineers and Musicians have developed with their great passion for Music. The X23 Active Crossover is an ideal crossover and used universally in most small and large PA systems, recording studio monitors, DJ setups, commercial installations and live concerts. It is not only adaptable in mounting to different sound systems, but also it has many developed features. For example, Clip LED Indicators, Mute switches for all frequencies output, CD Boost and Phase Inversion. The X23 Active Crossover is a single rack unit, dual channels electronic crossover, which is able to operate as the 2-way stereo and 3-way mono speaker systems.

Enjoy your X23 and make sure to read this Manual carefully before operation!

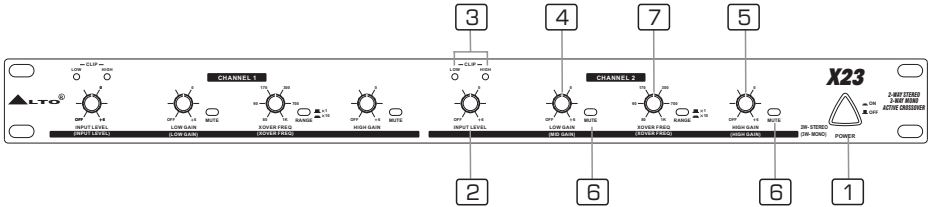
2. FEATURES

- ▲ Mountable in a 19" rack unit(1U)
- ▲ Clip LED indicators
- ▲ Mute switches used to mute the output signal of each frequencies range
- ▲ XLR balanced and connectors for inputs and outputs
- ▲ Excellent audio performance and low noise interference
- ▲ 1/4" TRS
- ▲ Phase inversion compensates for corresponding frequencies cancellation in some field
- ▲ CD Boost compensates power loss during the long distance transmission



3. CONTROL ELEMENTS

FRONT PANEL



1 POWER switch

This illuminated switch will turn your X23 ON and OFF

2 INPUT LEVEL

This knob regulates the level of the input signal fed into your X23.

3 CLIP

These LOW and HIGH Leds will light up when one or both audio bands are clipping. These leds should light up only occasionally for optimal operation and avoid distortion.

Turn the INPUT LEVEL control down if they are always on.

4 LOW GAIN

This knob will regulate the level of the low frequency band with a maximum gain of +6 dB.

5 HIGH GAIN

This knob will regulate the level of the high frequency band with a maximum gain of +6 dB.

6 MUTE

These switches will mute the respective low or high band. When the low-mute switch is engaged you will only hear the high frequency band and vice versa.

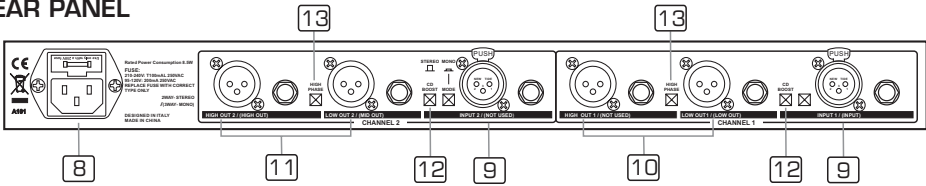
7 XOVER FREQUENCY

This knob will set the crossover frequency. You can vary continuously such frequency from 80 to 1kHz with the RANGE switch depressed and from 800 to 10 kHz with the RANGE switch engaged.



3. CONTROL ELEMENTS

REAR PANEL



8 AC Inlet and Fuse holder

Standard IEC receptacle. Connect your X23 to the AC with the supplied AC power cord. Before powering up your X23 for the first time, make certain the stated power requirement of the unit matches the voltage supplied by the AC socket.

If the fuse blows, replaced with a fuse of the correct type only.

9 INPUT 1 & 2

Lettering for 3-way mono operation is into brackets. Standard operation is 2-way stereo. You can feed balanced and unbalanced signals into your X23 through these connectors. For 2-way stereo operation the MODE switch must be disengaged. If the MODE switch is engaged, you will operate in 3-way MONO mode. In such case only use INPUT ONE to feed the signal into your X23. Do not use INPUT 2.

10 CHANNEL 1 HIGH AND LOW OUT

In 2-way stereo operation (MODE switch disengaged), connect these outputs respectively to the low frequency and high frequency power amplifiers. In 3-way mono operation (MODE switch engaged) connect LOW OUT to the low frequency power amplifier. Do not use the HIGH OUT OUTPUT.

11 CHANNEL 2 HIGH AND LOW OUT

In 2-way stereo operation (MODE switch disengaged), connect these outputs respectively to the low frequency and high frequency power amplifiers. In 3-way mono operation (MODE switch engaged) connect LOW OUT to the middle frequency power amplifier and HIGH OUT to the high frequency power amplifier.

12 CD BOOST

High frequencies, even when reproduced by good quality compression drivers and horns suffer of fast decay. Therefore the sound pressure level of high frequencies is affected by the distance of the horn from the Audience. With some large Live applications it may be necessary to boost the high frequencies to compensate such loss. CD boost stands for Constant Directivity Boost. Engaging this switch you will produce a boost of 3 dB at 3,5 kHz and then 6 dB x oct up to 22.5 kHz.

13 HIGH PHASE

This switch will produce a phase inversion of 180° to compensate for phase cancellation.

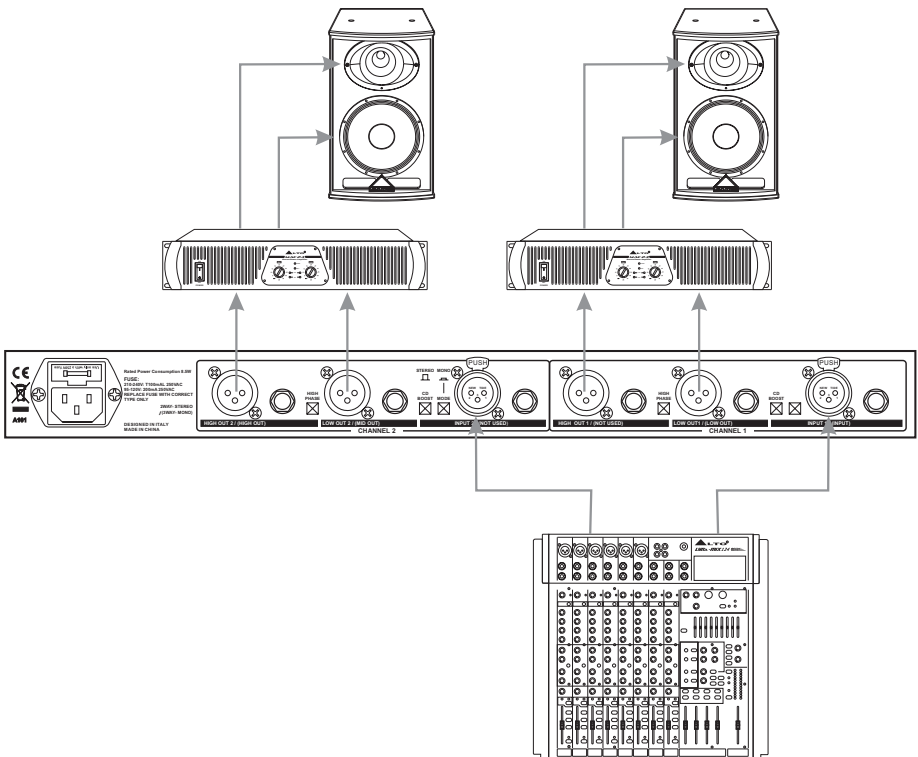


4. APPLICATIONS

2-Way Stereo

To work in this mode, configure your system and connect cables as follow:

1. Release the **MODE** switch to enter into the 2-way stereo mode.
2. Feed a stereo signal from the Mixer to the Input Connectors of CH1 and CH2.
3. Output the Low frequencies signal via OUT LOW 1 & 2 to the power amplifier dedicated to the woofers.
4. Output the High frequencies signal via OUT HIGH 1 & 2 to the power amplifier dedicated to the high frequency transducers.
5. Set LOW-HIGH Crossover Range of CH1 and CH2 to 10 (switch engaged) and select the desired crossover frequency.
6. Power up your X23 first, then the power amplifiers. After use, please ensure the power amplifier is turned off first, then your X23.



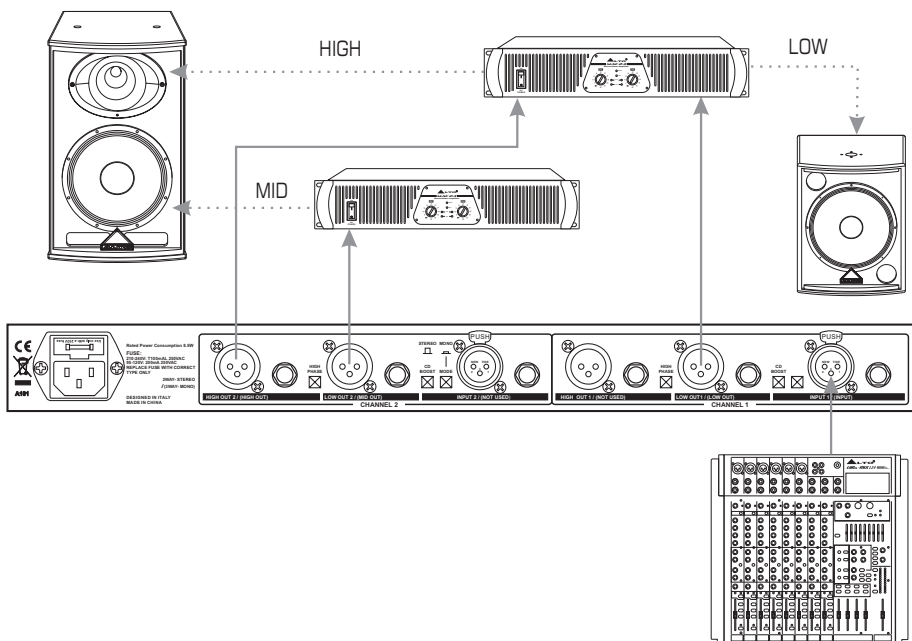


4. APPLICATIONS

3-WAY MONO

To work in this mode, configure your system and connect cables as follow:

1. Press the **MODE** switch to enter into the 3-way mono mode.
2. Feed a mono signal from the Mixer to the input connector of CH1.
3. Output the Low frequencies signal via OUT LOW 1 to the power amplifier dedicated to the woofers.
4. Output the Mid frequencies signal via OUT LOW 2 to the power amplifier dedicated to the midrange.
5. Output the High frequencies signal via OUT HIGH 2 to the power amplifier dedicated to the high frequency transducer.
6. Set LOW-HIGH Crossover Range of channel1 to x1 (switch disengaged) and select the desired crossover frequency. This channel will crossover low and mid frequencies.
7. Set LOW-HIGH Crossover Range of channel 2 to x10 (switch engaged) and select the desired crossover frequency. This channel will crossover mid and high frequencies.
8. Power up your X23 first, then the power amplifiers. After use, please ensure the power amplifier is turned off first, then your X23.





5. INSTALLATION AND CONNECTION

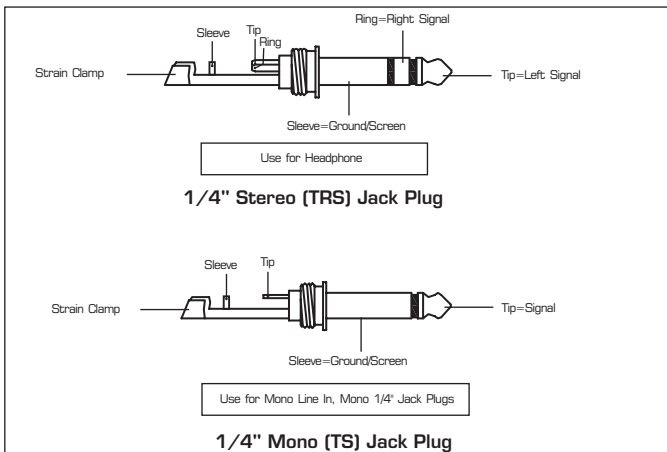
Ok, you have got to this point and you are now in the position to operate your X23 successfully. However, we advise you to read carefully the following section to be the real master of your own mix. Not paying attention enough to the input signal level, to the routing of the signal and the assignment of the signal will result in unwanted distortion, a corrupted signal or no sound at all. So you should follow this procedure for every single channel:

5.1 Mains Connection

Please ensure that the X23 is set to the correct supply voltage before plugging the power cord into the wall outlet, use the same fuse as marked on the fuse holder at the AC power connection. The mains connection of the X23 is made by using the enclosed mains cord and a standard IEC receptacle. It meets all of the international safety certification requirements.

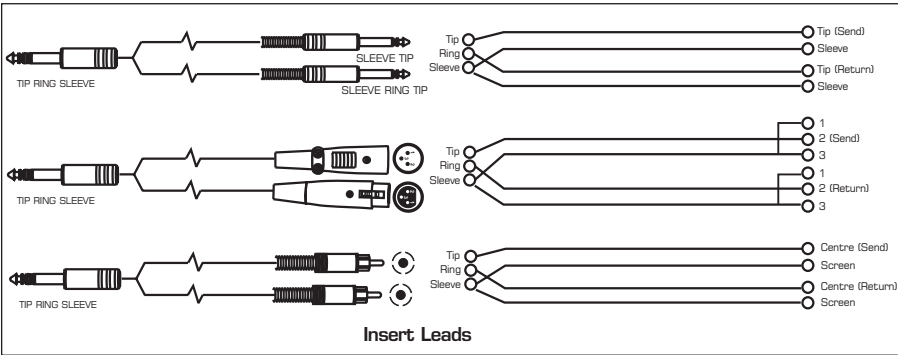
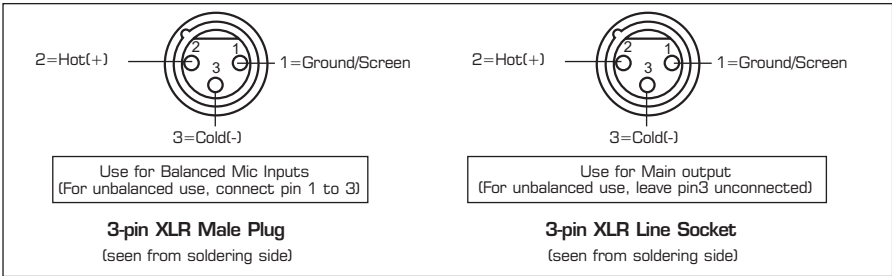
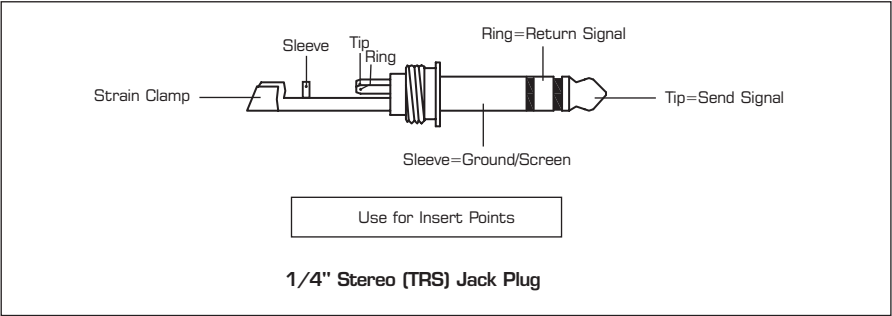
5.2 Audio Connection

The X23 presents with balanced XLR & 1/4" TRS and combo connectors. It can be interfaced in several ways to support a variety of applications without any signal loss. The X23 can be used on a single instrument by connecting to the mixing console's main inserts, or on an entire mix "in-line" between a mixing console's outputs and a power amplifier. The defective wiring may degrade the performance of X23, so please use good quality screened audio cables only. Please follow the guide below to interface X23 without experiencing any noise or signal loss.





5. INSTALLATION AND CONNECTION



5.3. RACK MOUNTING

The most secure mounting is on a universal rack shelf available from various rack manufacturers or your Dealer. The X23 Active Crossover fits into one standard 19" rack unit of space. Please allow at least an additional 4" depth for the connectors on the rear panel. Be sure that there is enough air space around the unit for sufficient ventilation and please do not place your X23 Active Crossover close to high temperature devices such as power amplifiers etc. to avoid overheating.

6. TECHNICAL SPECIFICATION

Electrical

LOW-MID Frequency Range	Rangex1 80 Hz - 1 kHz
MID-HIGH Frequency Range	Rangex10 800 Hz - 10 kHz
HUM & Noise	AV=0 dB, fc=800 Hz
LOW Section (Output@0 dB)	<-106 dBu
HIGH Section(Output @0 dB)	<-97 dBu
S/N Ratio	118 dB

Controls

Input Level	Continuously variable
Output Level	Low, high continuously variable
CD Boost	Rear panel switch
Mute	Low, high front panel switches
Phase	Rear panel switch

Power Supply

Connector type	3-pole IEC, grounded
Type	Servo controlled, stabilized
Mains supply	95-120 V~/210-240 V~, 60-50 Hz
Power Rating	8.5 W

Physical

Dimensions(W x D x H)	483 x194.5 x 44 mm (19"x7.7"x1.7")
Weight	3.1 Kg (6.84 lb)

7. WARRANTY

1. WARRANTY REGISTRATION CARD

To obtain Warranty Service, the buyer should first fill out and return the enclosed Warranty Registration Card within 10 days of the Purchase Date.

All the information presented in this Warranty Registration Card gives the manufacturer a better understanding of the sales status, so as to provide a more effective and efficient after-sales warranty service. Please fill out all the information carefully and genuinely, miswriting or absence of this card will void your warranty service.

2. RETURN NOTICE

- 2.1 In case of return for any warranty service, please make sure that the product is well packed in its original shipping carton, and it can protect your unit from any other extra damage.
- 2.2 Please provide a copy of your sales receipt or other proof of purchase with the returned machine, and give detail information about your return address and contact telephone number.
- 2.3 A brief description of the defect will be appreciated.
- 2.4 Please prepay all the costs involved in the return shipping, handling and insurance.

3. TERMS AND CONDITIONS

- 3.1 ▲LTO warrants that this product will be free from any defects in materials and/or workmanship for a period of 1 year from the purchase date if you have completed the Warranty Registration Card in time.
- 3.2 The warranty service is only available to the original consumer, who purchased this product directly from the retail dealer, and it can not be transferred.
- 3.3 During the warranty service, ▲LTO may repair or replace this product at its own option at no charge to you for parts or for labor in accordance with the right side of this limited warranty.
- 3.4 This warranty does not apply to the damages to this product that occurred as the following conditions:
 - Instead of operating in accordance with the user's manual thoroughly, any abuse or misuse of this product.
 - Normal tear and wear.
 - The product has been altered or modified in any way.
 - Damage which may have been caused either directly or indirectly by another product / force / etc.
 - Abnormal service or repairing by anyone other than the qualified personnel or technician.

And in such cases, all the expenses will be charged to the buyer:

- 3.5 In no event shall ▲LTO be liable for any incidental or consequential damages. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above exclusion or limitation may not apply to you.
- 3.6 This warranty gives you the specific rights, and these rights are compatible with the state laws, you may also have other statutory rights that may vary from state to state.

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