

User's Manual

DI4

Professional Direct BOX



www.altoproaudio.com
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— English —

SAFETY RELATED SYMBOLS



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.

WARNING

Describes precautions that should be observed to prevent the possibility of death or injury to the user.

CAUTION

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



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

WARNING

• Power Supply

Ensure that the mains source voltage (AC outlet) matches the voltage rating of the product. Failure to do so could result in damage to the product and possibly the user.

Unplug the product before electrical storms occur and when unused for long periods of time to reduce the risk of electric shock or fire.

• External Connection

Always use proper ready-made insulated mains cabling (power cord). Failure to do so could result in shock/death or fire. If in doubt, seek advice from a registered electrician.

• Do Not Remove Any Covers

Within the product are areas where high voltages may present. To reduce the risk of electric shock do not remove any covers unless the AC mains power cord is removed.

Covers should be removed by qualified service personnel only.

No user serviceable parts inside.

• Fuse

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.

• Protective Ground

Before turning the product ON, make sure that it is connected to Ground. This is to prevent the risk of electric shock.

Never cut internal or external Ground wires. Likewise, never remove Ground wiring from the Protective Ground Terminal.

• Operating Conditions

Always install in accordance with the manufacturer's instructions.

To avoid the risk of electric shock and damage, do not subject this product to any liquid/rain or moisture. Do not use this product when in close proximity to water.

Do not install this product near any direct heat source.

Do not block areas of ventilation. Failure to do so could result in fire.

Keep product away from naked flames.

IMPORTANT SAFETY INSTRUCTIONS

Read these instructions

Follow all instructions

Keep these instructions. Do not discard.

Heed all warnings.

Only use attachments/accessories specified by the manufacturer.

• Power Cord and Plug

Do not tamper with the power cord or plug. These 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.

• Cleaning

When required, either blow off dust from the product or use a dry cloth.

Do not use any solvents such as Benzol or Alcohol. For safety, keep product clean and free from dust.

• Servicing

Refer all servicing to qualified service personnel only.

Do not perform any servicing other than those instructions contained within the User's Manual.

Preface

Dear Customer:

Thanks for choosing ▲LTO DI 4 Direct Box and thanks for choosing one of the results of ▲LTO AUDIO TEAM job and researches.

For our ▲LTO AUDIO TEAM, music and sound are more than a job...are first of all passion and let us say...our obsession!

We have been designing professional audio products for a long time in cooperation with some of the major brands in the world in the audio field.

The ▲LTO line presents unparalleled analogue and digital products made by Musicians for Musicians in our R&D Centres in Italy, Netherlands, United Kingdom and Taiwan. The core of our digital audio products is a sophisticated DSP (Digital sound processor) and a large range of state of the art algorithms which have been developed by our Software Team for the last 7 years.

Because we are convinced you are the most important member of ▲LTO AUDIO TEAM and the one confirming the quality of our job, we would like to share with you our work and our dreams, pay attention to your suggestions and your comments. Following this idea we create our products and we will create the new ones! From our side, we guarantee you and we will guarantee you also in future the best quality, and the best fruits of our continuous researches and the best prices.

The DI 4 Direct Box has several basic functions: converting a high impedance signal to a low impedance signal; converting a "hot" instrument or line level (and sometimes even speaker level signal) signal to a microphone level signal suitable for connection to the Mic Input of a mixing console etc.. And it used to prevents hum and noise pick up due to special transformer decoupling.

Nothing else to add, but that we would like to thank all the people that made the ▲LTO DI 4 Direct Box a reality available to our customers, thank our designers and all ▲LTO staff, there to make possible the realization of products containing our idea of music and sound and there to support you, our customers, in the best way, conscious that you are our best richness.

Thank you very much.

▲LTO AUDIO TEAM

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1. INTRODUCTION

DI stands for "Direct Injection" and DI Boxes are also called Direct Boxes. You need to use Direct Boxes if you wish to convert a high impedance instrument signal or an unbalanced signal into a format that will be suitable for direct connection into a mixer.

With the ▲LTO DI 4 Direct Box,

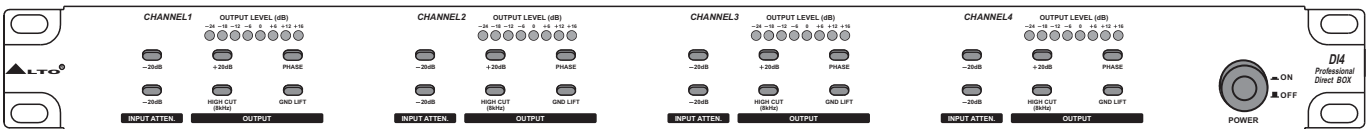
- a. You can convert a high impedance signal into a low impedance signal.
- b. You can convert an unbalanced signal into a balanced signal.
- c. You can convert a line level signal into a microphone level signal for connection into the Microphone input of the mixer.
- d. You can isolate the instrument on stage from the mixer. In such way you can eliminate noise caused by the ground loop.

There are basically two different kind of Direct Boxes on the market: Passive and active. Both will be connected to the MIC input of the Mixer but active boxes such as your DI 4 perform better and produce better frequency response.

2. YOUR DI 4 FEATURES:

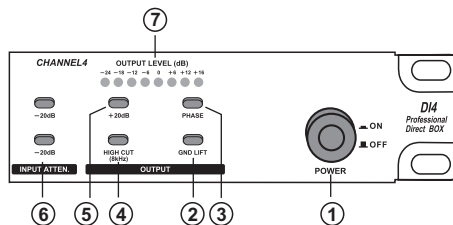
- XLR input and output connectors
- Converts unbalanced input into balanced output
- Phase problems instantly corrected through PHASE INVERSION switch
- Ground loop problems eliminated via GND LIFT switch
- 8kHz High cut Filter available for guitar applications
- 4 CHANNEL Direct Box for applications in recording studio and stage
- Special transformer decoupling in order to avoid hum and noise pick-up
- Outstanding audio performances insured by ultra-low noise operational amplifiers

3. CONTROL ELEMENTS



The DI 4 has four identical channel. Each channel presents with 6 push-button switches and 8 LEDs.

3.1 The Front Panel



1. Power Switch

To turn your DI 4 on and off.

2. GND Lift Switch

This switch disconnects the input signal ground from the output signal ground. In this way you can avoid hum produced by ground loop.

3. Switch for phase inversion

By pressing this switch you will reverse the signal phase by 180°. In normal situations, just forget about this switch but in case of inversion of the connectors this switch becomes very useful to compensate the phase cancellation.

4. High frequency Filter at 8 kHz

You can press this switch and activate the 8 kHz High Cut Filter when using an electric guitar with your DI 4 Direct Box.

5. Output Gain Switch (+20dB)

This switch is useful as a low level signal pre-amplification.

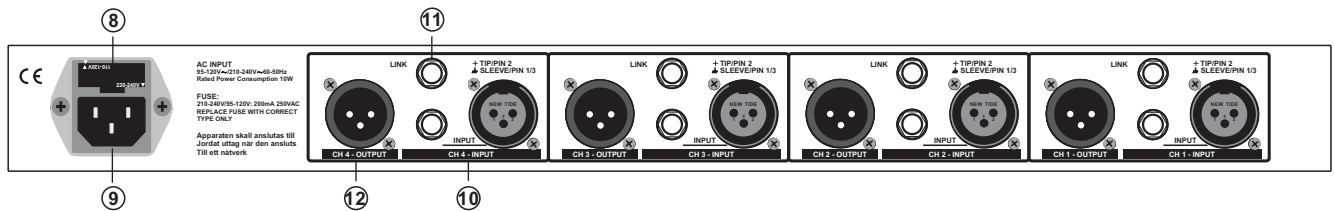
6. 20dB Attenuation Switches on input

Press either of these switches and you will attenuate the input signal by 20dB. In such way you can produce increased headroom and reduce the risk of distortion because of level peaks at input level when the input signal is quite hot.

7. LED Meter for Output Level

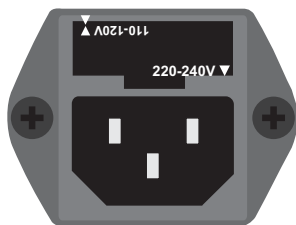
This Led Meter will read the output level and its range is -24dB to +16dB.

3.2 The Rear Panel

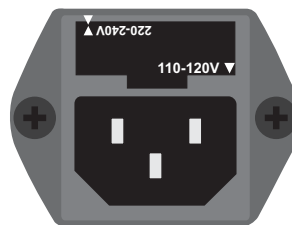


8. Voltage Selector and Fuse Holder

You must be sure of the Voltage available in your Country because this is a Dual Voltage Unit. Voltage operation can be changed through the fuse protecting the power supply but this operation must be performed by a qualified Engineer.



THIS IS SET FOR
110V AC TO 120V
AC OPERATION



THIS IS SET FOR
220V AC TO 240V
AC OPERATION

Please note the triangular markers on both sides of the fuse holder (See figure above). To change the voltage pull the fuse holder out, rotate it 180° and push it back again. The operating voltage will be indicated by one of the two triangular markers.

9. AC Inlet

After the correct voltage has been set you can connect the AC plug to the unit and in the AC power socket.

10. Input Connectors

Both XLR and unbalanced 1/4" TRS jack input connectors are supplied in your DI 4 Direct Box for maximum flexibility.

11. Link Connector

This 1/4" TRS jack will output the incoming signal directly being wired in parallel with the Input Connectors.

12. Output Connector

Finally, the output signal at MIC level will be produced by this XLR output connector. You must pay particular attention to the wiring of this XLR connector if phantom power of +48V is supplied to your DI 4 box.

4. INSTALLATION & CONNECTION

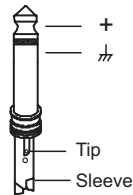
4.1 Audio Connection

Both XLR and 1/4" TRS connectors are available on your DI 4. In this way you can interface your DI 4 in several different ways without experiencing any noise or signal loss. You can use your DI 4 with single instrument using the mixer's main insert or on the complete mix connecting the DI 4 in between the mixer and the power amplifier.

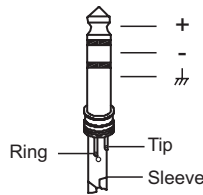
- Wiring Configuration

Either the 1/4" TRS phone jack or the XLR connector can be wired in balanced and unbalanced modes, which will be determined by the actual application status, please wire your system as the following wiring examples:

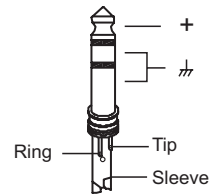
- For 1/4" Phone jack



TS Type Unbalanced

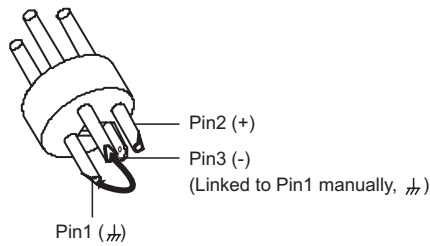


TRS Type Balanced

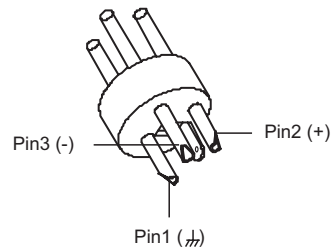


TRS Type Unbalanced

- For XLR connector



XLR Type Unbalanced

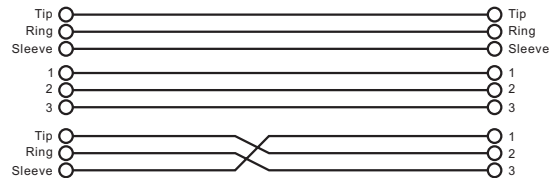
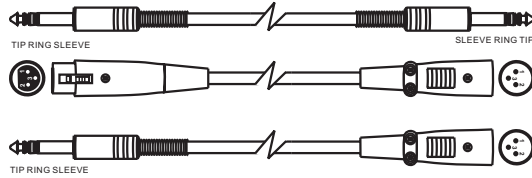


XLR Type Balanced

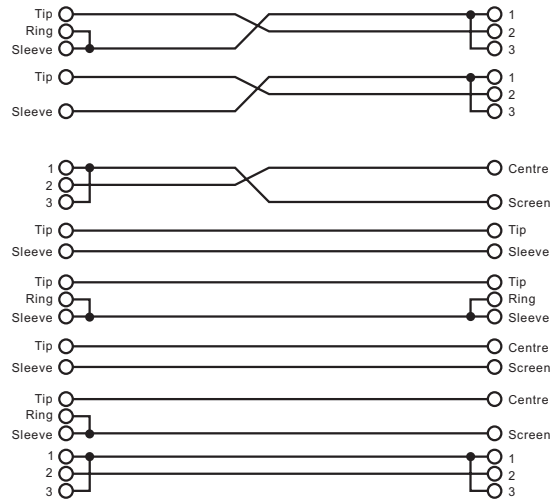
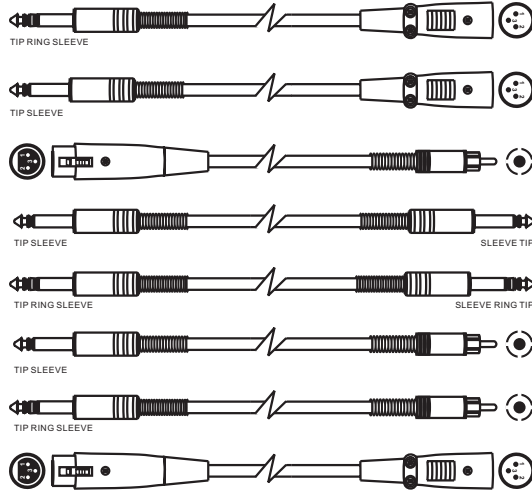
- In Line Connection

For these applications the DI 4 Direct Box provides 1/4" TRS connectors and XLR connectors to easily interface with most any professional audio device. Follow the configuration examples below for your particular connection.

• **Balanced**



• **Unbalanced**



4.2 Rack Mounting

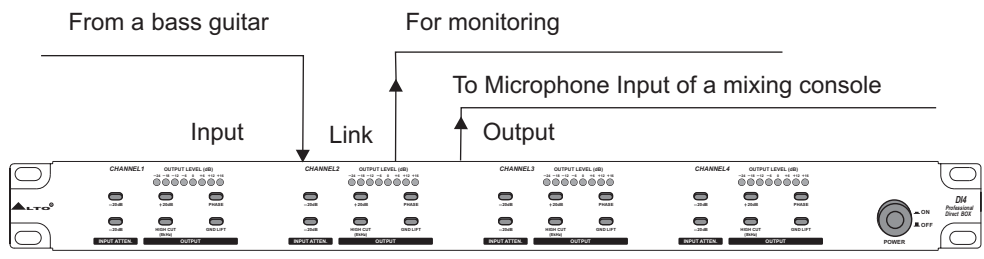
The most secure mounting is on a universal rack shelf available from various rack manufactures or your music dealer. The DI 4 Direct Box fit one standard 19" rack unit of space. Please allow at least an additional 4" depth for the connectors on the rear panel. Be sure that there is enough air space around the unit for sufficient ventilation and please do not place the DI 4 Direct Box on high temperature devices such as power amplifier etc. to avoid overheating

5. APPLICATIONS

So, we are telling you that after you have spent a fortune for your gear, you still need to by an extra piece of equipment such as the DI 4 box? You will be amazed how the DI 4 will transform your audio system whatever for studio or for live applications: No risk of miss-match impedance, no ground loop and hum. Please look at the following examples of applications

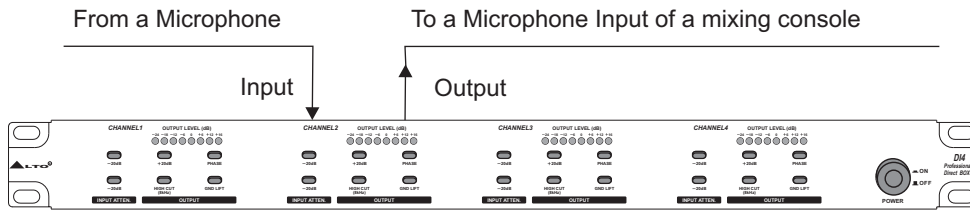
5.1 When the input signal is a Bass Guitar

You can connect your bass guitar directly into your DI 4. Then you can connect the DI 4 into the MIC input of your mixer. In such a way you do not need a Bass Amplifier on stage but you can still feed a Bass Amp using the Link Output connector of your DI 4.



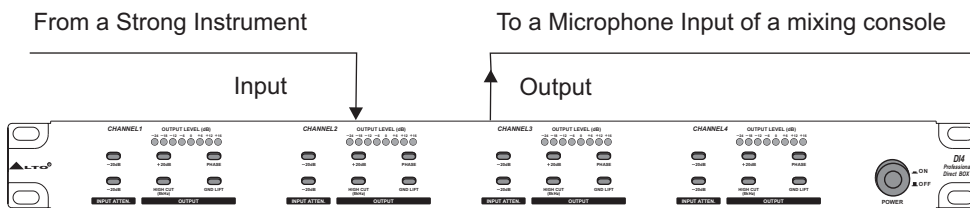
5.2 When the input signal is a microphone

In this way the unbalanced output of a microphone is converted into a balanced one. In such way you can cover a longer distance from the microphone to the mixer still avoiding noise problems.



5.3 How to convert a strong signal into MIC level signal

If you connect a line level signal or a speaker signal into a MIC input you would create a disaster. To avoid this just use either or both the 20 dB Attenuation Switches on your DI 4.



5.4 How to isolate the instrument on stage from the mixing console

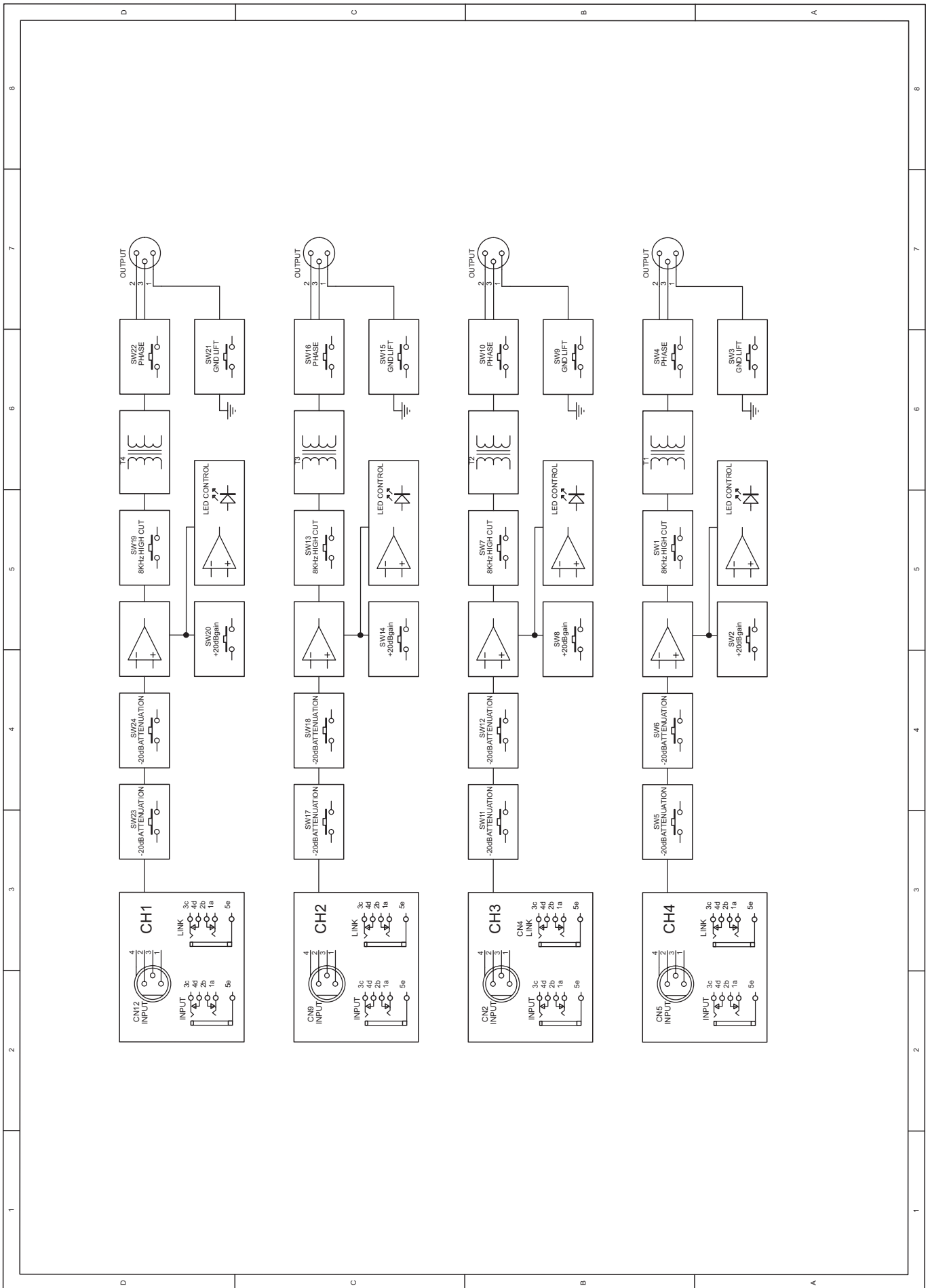
Tricky stuff now from your DI 4 box. OK in order to avoid ground problem the ground connection of an instrument to the mixer should be made with the DI 4. But in some cases the instrument will be connected to an amplifier as well through the same DI 4, so you have now a grounding point with the amplifier and another one with the mixer. If small differences occur in the ground of the amplifier and the mixer, AC current will flow into the shield. The resulting "ground loop" and 50/60 Hz noise will radiate from the shield to the center conductor and will produce hum. Fortunately your DI 4 is equipped with a GND Lift Switch that will eliminate the interference cause by the ground loop.

6. TECHNICAL SPECIFICATION

6.1 Specifications

Inputs		
	Inputs	1/4" jack unbal. In/Link Out
	Input Impedance	XLR unbalanced In
	Maximum Input level	max. 220 kOhm
Output		
	Output	XLR balanced Out
	Load Impedance	>600 Ohm
	Max Output Level	+18dBm
System specification		
	Bandwidth (100kOhm)	23Hz to 105 kHz (± 3 dB)
	Bandwidth (600Ohm)	23Hz to 60 kHz (± 3 dB)
	Bandwidth (High Cut)	10Hz to 8 kHz (± 3 dB)
	Noise Level	-105dBm
	THD+N@ 1kHz /10dBm	<0.01%
Power supply		
	Connector type	3-pole IEC, grounded
	Type	Servo controlled, stabilized
	Mains supply	95-120V~/210-240V~,60-50Hz
	Power Rating	Consumption 10W
	Fuse	210-240V/95-120V: 200mA 250VAC
Physical		
	Dimensions	483mm × 197.5mm × 44.2mm
	Weight	3.7Kg

6.2 Block Diagram



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 purport 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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