Channel D Lino C 2.0

Balanced, Current Mode Direct-Coupled Wide Bandwidth Low Distortion Low Noise Precision Phono Preamplifier

For Low Output Moving-Coil Phono Cartridges

Installation and Use Manual

Revision 2c

QUICK START

1. Allow your Lino C to fully acclimate to ambient temperature before removing it from the inner plastic bag.

2. Current mode phono preamplifiers use balanced input wiring. Balanced wiring consists of a twisted pair of two independent conductors inside a shield, for a total of three independent conductors. *Current mode phono preamps may exhibit audible hum with unbalanced (coaxial conductor with shield) wiring.* RCA to XLR adapters are included, but a properly wired balanced interconnect is needed to guarantee no audible hum.

3. *Unmodified* Rega turntables and tonearms cannot be connected to balanced preamplifiers because Rega connects the chassis ground to a cartridge signal connection, preventing making a balanced signal connection, resulting in noise and hum.

4. Connect the turntable and output connections. Connect the power adapter to the Lino C. The barrel connector of the power adapter will *easily* slide into the power input jack on the rear of the Lino C. If it seems to not slide in easily, verify the alignment of the plug and try again. It can be damaged by using excessive force. Next, plug the line cord into utility power.

5. Two green indicator lights on the bottom of the chassis will illuminate when the Lino C has power and is operating.

6.* It's best to keep the Lino C continuously connected to utility power. *Unplugging the power adapter from the utility line will place the Lino C into "Off the Grid" mode. Read the manual for important information before using Off the Grid mode.

7. Disconnect the power adapter from the rear of the Lino C to fully power down the Lino C.

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www.channel-d.com

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Congratulations on your purchase of a Lino C phono preamplifier! The Lino C is a low noise, low distortion fully balanced *current mode* preamplifier featuring a wide frequency bandwidth. This provides you with the key to obtaining stunning, three-dimensional music reproduction from your LP records.

The Lino C is specifically designed to deliver extremely high quality music reproduction from low output moving-coil cartridges.

The Lino C incorporates newly available power supply components that enable circuit design strategies delivering power supply performance very closely approaching that of our flagship Seta® rechargeable-battery phono preamplifiers. Like our flagship Seta models, modern manufacturing methods are used, including low-noise, four-layer circuit boards and precision, surface mount components. Surface mount components provide the shortest signal paths and highly optimized circuit layouts, with low stray inductance, capacitance, improved unit to unit consistency and performance all eclipsing old-fashioned through-hole designs. The result is a phono preamplifier with exquisite performance far exceeding expectations, especially considering its relatively modest price in the arena of most high end components.

The high precision (better than ± 0.1 dB) RIAA EQ accuracy provides standard RIAA-corrected phono preamplifier outputs with outstanding quality. The Lino C also is perfect as a preamplifier for connecting to high resolution (192 kHz / 24 bit), balanced-input analog to digital converters (ADCs). The Lino C's selectable Flat output used in conjunction with Channel D's *Pure Vinyl™* software providing RIAA EQ correction combines the strengths of the latest cutting-edge analog and digital technologies, delivering superb, high definition transparent vinyl playback.

The benefit of having the availability of selectable Flat and RIAA outputs can facilitate linking analog LP playback with the performance and flexibility of high resolution digital audio, should you desire to do so later in the future.

Getting Started

Please take the time to read this Installation and Use Manual to familiarize yourself with the installation and operation of your Lino C.

Important: If the package you received from your shipper is substantially above or below ambient temperature, please allow your Lino C to acclimate at room temperature for a few hours before opening the plastic bag containing your Lino C, to avoid causing condensation on cold internal surfaces (if colder than ambient temperature), and to allow the internal battery to come to temperature equilibrium for optimal operation.

The following items are included. Please check the package and notify Channel D of any discrepancy:

- Lino C Preamplifier
- External 5 volt power supply, 2.1 mm tip positive, 110 to 220 Volt 50 - 60 Hz Input, US domestic two conductor power cord (can be used with international adapters)
- 3/32" Allen Key
- Nonconductive stylus for setting configuration switches
- Accessory right-angle 2.5 mm barrel plug with stripped and tinned pigtail
- Plug covers for bottom switch access ports
- Performance Measurement Graph showing your own Lino C's measured RIAA EQ accuracy. Note: the serial number of the RIAA circuit board inside your Lino C is the same as the serial number of your Lino C.

Before making any signal connections, disconnect the power supply from the rear of the Lino C.

If using Channel D Pure Vinyl™ software: *be sure to mute the Pure Vinyl application software, if running on the computer, or otherwise mute or power down your power amplifier(s) while making signal connections, to avoid generating noises which could damage loudspeakers.*

Signal Inputs

- The Lino C, as a current mode MC preamplifier, requires balanced (shielded twisted pair, which is two conductors inside a shield for a total of three independent conductors; as contrasted with coaxial unbalanced cable which is one conductor plus a shield) connections to the turntable. Turntables with RCA jacks can be used with an RCA to XLR cable. **Important: Pin 1 of the XLR connector must not be connected to either of the signal conductors, or hum/noise/ distortion will result. Pin 1 should only be connected to the cable shield. If you detect any hum/noise/distortion please detach and check your input connection cable using a continuity tester or ohmmeter to insure that Pin 1 of the XLR is not internally connected to Pins 2 or 3.**

  Balanced cable and signal connections provide better noise immunity (because of common mode noise rejection) than conventional shielded (single conductor plus coaxial shield) cable. They are also a requirement for a current mode preamplifier, or hum/noise/distortion will result.

Chassis Ground

- Securely connect the chassis ground wire from your turntable / tonearm (if so equipped) to the grounding lug on the rear panel of the Lino C. If your turntable doesn't have a grounding connection, leave this terminal disconnected. **Important**: *only* connect the ground to a turntable chassis or ground wire, not to a ground connection on any other equipment.

Balanced Outputs

- The low impedance, balanced XLR outputs are configured by the factory to supply conventional RIAA corrected output.

  The balanced outputs also can be configured to bypass the RIAA EQ for connection to the balanced inputs of a professional audio interface, for use with Channel D's Pure Vinyl™ software (for Mac computers) for applying RIAA compensation. (Consult the Pure Vinyl software User Guide for more information.)

  If necessary, XLR output pin 3 may safely be connected to circuit common / ground (Pin 1), because the Lino C has servo balanced (ground sensing) outputs.

Single-Ended Outputs

- The single-ended / unbalanced outputs supply conventional RIAA corrected output for use with single ended / unbalanced outputs for a line preamplifier lacking balanced inputs. This corresponds to a standard phono preamplifier (with RIAA EQ curve) output signal.

  The RCA phono outputs are true, single ended (unbalanced) connections derived by differentially summing the balanced signal "legs," rather than taking the unadvisable shortcut of only using the positive polarity signal leg of the balanced circuit, which would deliver poor performance.

  Also, the standard RIAA EQ compensated signal appearing on the RCA output connectors is generated from a signal side chain independent of the XLR / balanced outputs, and may be used simultaneously with the XLR outputs without compromising the performance of the Lino.

Note: the Balanced and Single-Ended outputs are on separate signal chains, and may be used simultaneously.

Power Up

- Connect the 5 volt power adapter to the power input jack on the back of the Lino C, and then connect the line to utility power. The Lino will activate after several seconds. A faint click may be heard as the internal relays are engaged.

Insert the barrel connector into the rear panel receptacle with gentle, minimal force. If it seems to not insert into the receptacle, please insure it is correctly aligned with the connector. Do not apply excessive force or the receptacle may be damaged. Two green power indicators will illuminate on the bottom of the chassis.

Power Down

- Disconnect the 5 volt power adaptor from the power input jack on the back of the Lino C.

- **"Off the Grid" Mode:** The Lino C may be operated entirely from the internal battery by disconnecting the wall plug from utility power and leaving the barrel connector inserted in the back of the Lino C. This can be confirmed by the power indicators on the bottom of the chassis, and of course, the Lino C's operation. ***Reconnect the Lino and power adapter to utility power after using this mode to maintain the battery charge and to insure optimum battery life.***

Rechargeable Battery

- **Keep the Lino C continuously connected to utility power for maximum battery life.** The resulting quiescent power draw is low, less than 2 watts. Battery charging is automatically managed. **The charging adapter is disconnected internally when an input signal is detected.** Then, the Lino C is galvanically isolated. The charging adapter will be automatically reconnected, recharging the battery, when an input signal is absent for approximately 10 minutes.

- The 9 ampere hour AGM battery will provide over 24 hours of continuous operation. Having the battery sited inside the chassis with the circuitry insures that it serves as a noise *sink* instead of antenna, if it were housed externally and connected via an umbilical. The benefits of its low impedance are also realized because the battery is physically close to the circuitry being powered.

Important note: Do *not* replace the power supply with a different one. The two-wire power supply has been very carefully selected for galvanic isolation and low noise. If replaced with a linear supply or a three-wire supply even of exactly the same rating, the internal circuitry may be damaged. ***This will void the warranty.***

In answer to user inquiries: the performance of the Lino C will *not* be improved by substituting a battery for the power adapter. The Lino C depends on having a relatively stable 5 volt (within ± 0.2 volt) DC input. This is not possible to achieve with any type of battery chemistry without also providing additional voltage regulation. An input supply voltage above 5.2 volts will damage the Lino C. An input voltage below 4.8 volts will result in diminished performance and battery life, and the Lino C may not even operate.

Power Adapter: The external, brick style supply adapter provides a galvanically isolated (a key consideration) raw DC voltage. The output is not used "straight" from the adapter, but stepped up inside the preamplifier to split supplies and then very highly filtered in multiple stages.

The circuitry employs a 4 layer circuit board with separate and continuous low inductance, low impedance internal ground and power planes congruent with the preamplifier circuitry. *The resulting power supply rails have much lower noise and ripple and tighter regulation than a linear DC supply can provide.* This is borne out in the signal to noise performance. A welcome additional benefit is very low idle power consumption and negligible heat production.

This kind of design wasn't even possible as recently as just 10 years ago. However, we now have a plentiful palette of new components to pick and choose from, thanks to the burgeoning consumer electronics industry's continuing quest for increasing miniaturization and reduced power consumption.

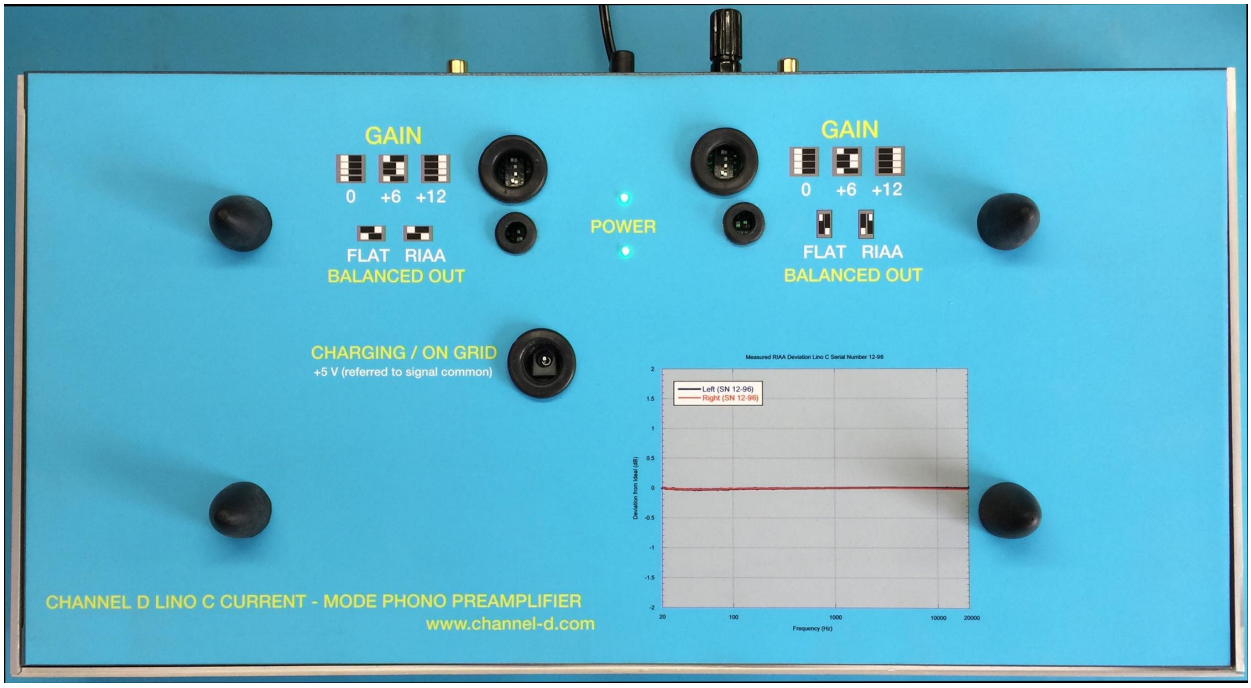
Lino C Configuration

The internal signal routing of the Lino C is configurable. The factory "out of the box" settings are preconfigured for the most common usage scenario, or can be changed to suit your preferences.

<u>Unplug the power supply from the jack on the back of the Lino C before changing any configuration settings.</u>

Use the supplied nonconductive stylus to actuate the configuration switches. A fine tipped screwdriver also may be carefully used.

When making configuration settings, place the Lino on a flat surface covered by a soft cloth to avoid marring the finish.



(1) Preamplifier Gain: The gain is adjustable via two four-pole DIP switches. There are 0 dB and +6 dB settings, plus maximum (+12 dB) gain by placing both of the two four-pole switches in the right-most position. The factory setting is for minimum gain (0 dB). Only select a higher gain setting if needed for matching the level to other components in your system. The gain settings are not cumulative; that is, the only settings are 0 dB, 6 dB and 12 dB.

> **Information for Pure Vinyl™ users:** The *Pure Vinyl User Guide* includes complete information on setting the proper preamplifier gain for transferring LPs to digital files (with an external ADC - not included). Briefly, **you should aim for "Dry" signal level <u>peaks</u> in Pure Vinyl between -12 and -2 dBFS, for the music that you usually play.** Provided that peaks usually reach these levels, it's not necessary to have to adjust the gain setting frequently, or at all. It's prudent to allow at least 4 to 6 dB of headroom below full scale, to accommodate unexpectedly loud modulation levels. At the low end of the suggested signal range above, be certain that a signal peak represents music and not "pops" or "clicks."
>
> **If your audio interface permits setting nominal input signal levels to consumer or professional format** (true of professional audio interfaces from Lynx, RME, etc.)**, first try the consumer ("-10 dbV") setting, in conjunction with the minimum gain setting on the Lino.**

- **If signal levels are too high,** set the **input** of the audio interface to professional ("+4 dBu") format.

- **If the levels are too low,** increase the gain on the Lino C. (For monitoring / playback, if the **output** levels of your interface can be adjusted independently of the input levels, use the +4 dBu setting for the **output**.)

(2) Balanced Output Signal Connectors - Signal Source

Balanced Output Phono Stage (factory setting): slide the two two-pole DIP switches according to the diagrams on the cover for RIAA. Standard RIAA output is the factory configuration unless Channel D is advised in advance of shipment that you intend to use the Lino with an external ADC.

Flat Phono Preamplifier for using with an external ADC and Pure Vinyl: slide the two DIP switches according to the diagrams on the cover for FLAT.

Do not set the switches to any other setting than shown, or severe distortion will result.

(3) Cartridge Loading: As a current mode phono preamplifier, the Lino C doesn't require setting the cartridge load. All of the signal current produced by the cartridge is fully used with this design, which also insures that the cartridge's mechanical and electrical characteristics are fully damped and optimized.

(4) Charging / On Grid Signal Port: A 2.5 mm barrel jack is provided on the bottom of the preamplifier. When the Lino C is playing music (signal present) the port will have 0 volts. When the Lino C is in charging mode, 5 volts is supplied at the port (tip positive) via a small signal relay inside the Lino C. The 5 volts is referenced to chassis ground (circuit common).

This is a useful feature that can be used in conjunction with the Lino C's "off the grid" mode.

Though the charging supply is automatically disconnected internally when a signal is present, some audio enthusiasts express additional concern about external power supplies putatively affecting the quality of the utility line power delivered to other components in the audio system. This "off the grid" mode allows operating the Lino without having the power brick energized or connected to utility power.

- MANUAL "off the grid" mode: Disconnect the power supply two prong plug from the utility power line. The power supply barrel must remain inserted in the Lino. Unplugging the barrel connector will power down the Lino.

The disadvantage to manual mode is that you must remember to reconnect the power supply to avoid over-discharging the battery.

- AUTOMATIC "off the grid" mode: An optional, isolated power switching relay is required (not supplied). These can be obtained from vendors like Amazon. Example:
https://www.amazon.com/Iot-Relay-Enclosed-High-Power-Raspberry/dp/B00WV7GMA2

or search for "AC / DC Control Relay" or search the Internet for "Iot Relay"

These relays use a trigger input, such as the 5 volt charging signal supplied on the **Charging / On Grid Signal Port** to activate the power line.

The charging signal port can be used to automatically connect and disconnect the Lino C power supply from the utility power. When a signal is present and the preamplifier is in operation, the power supply is completely disconnected from the utility line. When a signal is not present, the power supply is automatically reconnected, charging the battery.

AGM Rechargeable Battery Operation and Charging

The Lino C should always be kept powered, to maintain a stable circuit temperature and the condition of the AGM battery. The power consumption (no signal) when the battery is fully charged is low, less than 2 watts. If necessary, the Lino C may be disconnected from the power supply for several months without adversely affecting the battery life. *Do not store the Lino C at elevated temperatures*, such as in an attic or garage.

The Lino C must be connected to the external power supply to initially power up. This design insures that the battery isn't accidentally over-discharged, which could shorten its life. The power supply is used to activate two normally-open relays, which connect the battery to the Lino C circuitry, and the charging supply to the battery. When a signal is detected (also true of the power-up state), the second relay is deactivated, disconnecting the charging supply from the battery (and the Lino C preamplifier circuitry). The battery voltage monitoring and power management are automatic. A new battery, when fully charged, is capable of supplying power for well over 24 hours of continuous operation.

The AGM type lead/acid rechargeable ("secondary") battery is superior to all other battery types for high-end audio. Audio doesn't require the lower mass of lithium (such as automotive or aircraft). The charging electronics of Li-ion are troublesome, and such batteries can fail in spectacular (and hazardous) ways. AGM will not leak electrolyte if the case is damaged / cracked because the electrolyte is contained by the sponge-like fiberglass battery plate separators. AGM is also about one-fifth the cost of a Li-ion battery with the same energy storage capacity. *"Primary" (throw-away or non-rechargeable) batteries such as 1.5 or 9 volt alkaline cells are unsuitable for high quality audio applications because of their very high internal resistance and resulting susceptibility to electromagnetic noise pickup*.

The battery is capable of supplying over 20 amperes of peak current. The battery is conditioned and kept float-charged by a proprietary circuit developed by Channel D, rather than use an "off the shelf" microprocessor based conditioning and monitoring circuit (which is necessary for Li-ion), which would introduce unwanted noise. Locating the battery inside the preamplifier chassis also insures that the battery is in the same electrical environment as the sensitive circuitry, eliminating many sources of noise pickup.

The Lino C will automatically activate Charge mode (with the power adapter connected and connected to utility power) under either of the following two normal conditions:

- A signal resulting in an *output* level of less than -20 dBV isn't detected for about 10 minutes.
- The AGM battery has exhausted its charge.

Battery Life / Battery Replacement

Typical battery life will be between 3 and 5 years; up to 20 years is possible. The battery life is determined by three factors:

(1) operating environment temperature. Temperatures above 80 F should be avoided, as this will shorten the battery life

(2) the number of deep discharges, defined as continuous operation with a signal connected (or in 100% battery mode) for more than 24 hours, or until the battery switches to charging mode

(3) battery life will be extended by keeping the Lino C continuously connected to a power source and the battery fully charged. The idle power consumption is less than 2 watts.

The battery capacity also typically will increase slightly (by a few percent) during the first few discharge / recharge cycles.

Testing Battery Capacity: This test only would be performed annually, and not on a new Lino C which will always have a new and fully tested battery installed. Disconnect the power adapter from the wall socket. If the Lino C shuts off in less than six hours, the internal rechargeable battery should be replaced.

The AGM (Absorbent Glass Mat plate separator type) lead/acid battery is a widely available and economical type, commonly used for security alarm systems or remote power backup. They can be obtained from online retailers such as Amazon (at Amazon, search for Power Sonic PS-490; we recommend only using the genuine gray and blue Power Sonic brand rather than a putative "replacement" type). Alternatively, McMaster-Carr (mcmaster.com) part number 7448K25 is the Power Sonic PS-490.

- It's best to obtain a "fresh" replacement when needed, rather than keeping spares on hand, because degradation will begin to occur if stored for more than a few months without charging. The Lino C may be operated continuously, even with a degraded battery, so waiting for replacements to ship shouldn't be a problem.

- The replacement battery should be at ambient room temperature before installing.

Important Safety Notice: when replacing batteries, hazardous *voltages* aren't present, but the battery is capable of supplying large currents (similar to an electric arc welder).

This high current capability is important to the superior audio performance of the Lino C, but also necessitates caution. If a battery terminal is accidentally shorted to a metallic conductor, such as a circuit board, the resulting electrical arc / sparking may severely damage the Lino C.

It's safe to touch or handle the battery terminals with your *bare* hands. However, **remove any metallic personal jewelry or items that could inadvertently contact and short the battery terminals together.** High temperatures generated by large currents conducted through metallic objects, possibly melting them, can result in serious burns and injury.

If you don't wish to perform the battery replacement yourself, the Lino C can be shipped to Channel D for battery replacement. *Please contact Channel D for shipping information and pricing, and a Return Material Authorization.*

1. Remove the cover of the Lino C in accordance with the instructions on the following page.

2. Disconnect the silicone insulated wire harness from the battery circuit board by depressing the locking latch on the connector and carefully pulling the connector from the circuit board.

3. Remove the battery with attached circuit board from the chassis.

4. Carefully slide the circuit board off the battery spade lug terminals.

5. Attach the circuit board to the spade lug terminals of the replacement battery. The top edge of the circuit board will be flush with or slightly below the top edge of the battery when properly attached.

6. Position the assembly inside the chassis and reattach the power connector.

7. Replace the cover of the Lino C in accordance with the instructions on the following page.

Opening the Lino C Chassis

1. Disconnect the power adapter and all signal connections from the Lino C.

2, Place a soft cloth under the work area to keep from marring the finish on the Lino C.

Opening the chassis of the Lino C 2.0 requires removing a total of 6 fasteners.

3. Remove a total of four Phillips screws from the side panels with a Phillips screwdriver. There are two on each side.

4. Remove two flat head hex screws (indicated in image above) from the rear panel using the supplied 3/32” hex key.

5. The lid, sides and front panel will detach together as one assembly. The rear panel is attached to the base.

The rear panel mates with the lid via a tongue and groove arrangement. To remove, place your fingers under the rear sides of the chassis. Brace your thumbs on the slight flange of the bottom portion of the chassis and use your thumbs to push away as you lift off the lid with your other fingers. Be careful not to rock the lid excessively, to avoid damaging the machined tongue. The rear panel with the signal connections will remain attached to the base.

The Lino C may be operated with the cover removed.

To reassemble the Lino C:

1. Position the lid so that the groove on the rear of the cover is above the protruding tongue on the rear panel. Carefully guide the lid so that the machined tongue is inserted. When correctly positioned, the bottom of the back chassis plate will rest on the base, almost flush with the back edge of the base.

2. Insert the two 10-24 thread flat head Allen screws in the rear panel. Tighten the fasteners finger tight at this stage (use the supplied 3/16" hex key if needed).

> The screw threads should **easily** engage into the threaded holes in the bracket on the lid by using only your fingers. If not, please confirm that the tongue and groove is properly mated and try again.

3. Reattach the Phillips screws. Tighten until just snug; do not over tighten.

> The chamfered holes in the side panels must be centered precisely on the threaded bushings in the base for the screw threads to engage properly. It may help to brace the chassis against your body while applying pressure on the chassis to make the holes align with the bushings. The chassis is slightly stressed to attain higher rigidity for better immunity to external vibrations.

4. Snugly tighten the two flat head Allen screws with the supplied 3/16" hex key. Do not over tighten.

Specifications - Lino C Current Mode Preamplifier for Low Output/Low Impedance (Moving Coil) Cartridges

- **Input Load Resistance:** less than 1 ohm, current mode (transconductance amplifier)
- **Inputs:** Balanced , Neutrik Premium XLR
- **Outputs:** Balanced, Neutrik Premium XLR
- **Output Impedance:** less than 100 ohms balanced / less than 25 ohms unbalanced
- **Power:** 5 volt external power adapter, 2.1 mm barrel, two wire utility plug, tip positive
- **Power Consumption:** less than 2 watts idle
- **Circuit Topology:** Balanced, direct-coupled from input to output (no capacitors in the signal path). Modern surface mount component technology.

- **Gain:** The gain of the Lino C current-mode phono preamplifier depends on the phono cartridge characteristics. The Lino C has more than 80 dB of signal gain at the maximum gain setting when using an ultra low impedance / ultra low output cartridge.

  For example, the gain at the maximum (+12 dB) setting with a cartridge having 1 ohm internal resistance (the cartridge internal resistance is related to, but not the same thing as the cartridge load resistance applied with a conventional voltage-mode preamplifier) would be 85 dB. With a 5 ohm cartridge, maximum gain is 74 dB. If the cartridge has a higher internal resistance than 5 ohms, the gain will be less. Higher resistance cartridges have higher output voltage, and require less preamplifier gain. This dovetails perfectly with the current-mode design of the Lino C preamplifier.

  The gain of the Balanced outputs, configured for "Flat" gain (bypassing the RIAA compensation circuit), is 12 dB less. This is in accordance with the RIAA treble emphasis and typical tonal balance of a music signal from an LP record.

- **RIAA Accuracy:** better than ±0.1 dB, 20 Hz - 20 kHz
- **RIAA Channel Matching:** better than ±0.02 dB, 20 Hz - 20 kHz
- **Channel Separation:** ≥ 80 dB, 20 Hz - 20 kHz
- **Distortion:** lower than 0.005%, 20 Hz to 20 kHz
- **Outputs:** Balanced, Neutrik Premium XLR (internal switch setting for FLAT or RIAA); Gold-plated RCA
- **RIAA Circuit Topology:** Direct coupled from input to output; no DC blocking capacitors in signal path. Two stage correction circuit. (1) Passive high frequency correction. (2) Active low frequency correction using low distortion wide bandwidth FET amplifier. Independent balanced XLR and unbalanced RCA ground referenced outputs. Modern surface mount component technology.

General

- **Dimensions:** 17.1" x 2.9" x 9.3" (W x H x D)
- **Shipping Weight:** 18 pounds

Miscellaneous: Precision, 0.1 percent tolerance low temperature coefficient, low noise metal film resistors. Ultra low dissipation sputtered metal film polypropylene capacitors, selected and matched by hand to better than 0.1 percent tolerance for outstanding RIAA accuracy. Ultra low ESR power supply decoupling capacitors. Low noise, four-layer circuit boards with continuous internal ground and power planes. Carefully selected, low noise galvanically isolated brick power supply, filtered in multiple stages for extremely low noise.

Warranty

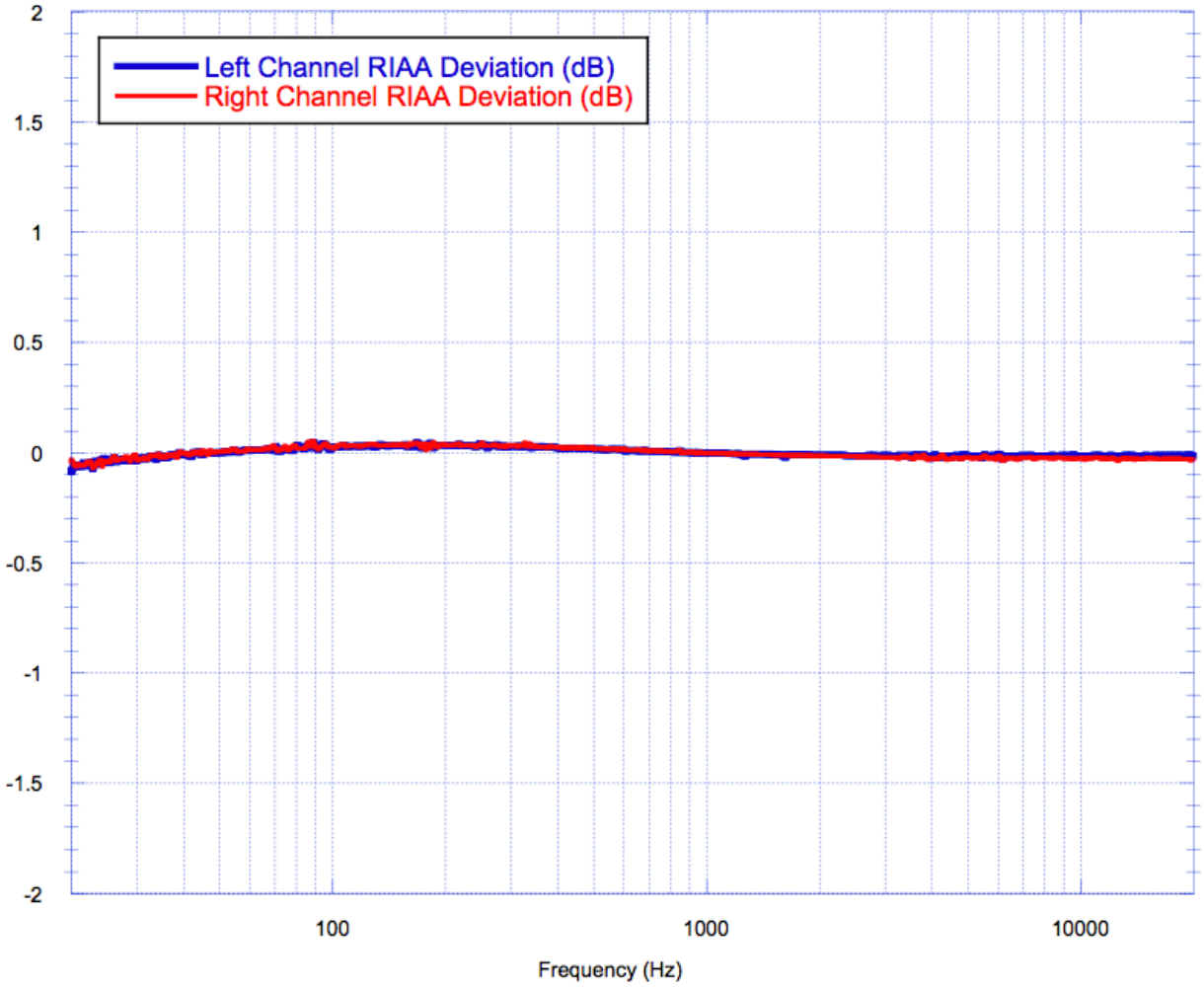
- Electronics, five years; battery, 3 years; parts and labor, limited warranty. In the unlikely event your Lino must be returned to Channel D for repair, ***contact Channel D in advance for a return material authorization number and shipping instructions.***

In keeping with our continuing efforts to enhance and improve our products, we reserve the right to change specifications, pricing, or included accessories without notice.

APPENDIX

20 Hz to 20 kHz Sample RIAA Accuracy Graph

This is a sample. The graph for your own preamplifier's actual measured RIAA accuracy is included separately.



Instructions for using the ***optional*** Amazon AC / DC control relay (see page 5 of this manual)

https://www.amazon.com/Iot-Relay-Enclosed-High-Power-Raspberry/dp/B00WV7GMA2

(or search for AC / DC Control Relay, or search the Internet for IoT Relay)

1. Attach the accessory pigtail supplied with the Lino C to the green two pole connector of the AC / DC Control Relay using a fine tipped slotted screwdriver. The striped wire of the pigtail corresponds to the positive polarity connection. Be sure to observe proper polarity.

2. Connect the right-angle barrel end of the connector to the port on the underside of the Lino C.

3. Connect the two pole connector to the port on the AC / DC Control Relay.

4. Plug the Control Relay into the utility line using the three prong utility power cord.

5. Plug the Lino C power supply barrel connector into the back of the Lino C.

6. Plug the Lino C power supply two prong utility cord into the “always on” outlet on the AC / DC Control Relay. This will power up the Lino C.

7. Next, move the Lino C power supply two prong utility cord into the “normally OFF” outlet on the AC / DC Control Relay.

The Lino C power supply will be completely disconnected from the utility line when a signal is present at the input of the Lino C. The Lino C power supply will be reconnected when a signal is absent for about 10 minutes. The latter can be verified by the illumination of the green Switch Active LED on the AC / DC Control Relay.

To fully power down the Lino C, disconnect the barrel plug from the rear of the Lino C.