



Black Cube
phono stage
High Precision
Passive RIAA-Network

User manual
Please read completely before operating device

Valued customer,

Congratulations for buying the Lehmann audio Black Cube phono RIAA preamplifier. The Black Cube is manufactured in Germany using very high quality components and carefully constructed to give you many years of musical pleasure.

This unit is mate only for being inserted between a turntable's passive cartridge output and any audio amplifier's high level input. The Black Cube will handle nearly any system cartridge from high-level to low-level MM or MC and is made to fulfill the demands of audiophiles who enjoy analog music reproduction.

Please keep this manual nearby the Black Cube so that you can refer to it for further use.

Precautions

Please read the following before operating your Black Cube phono preamplifier. Wherever applicable below, Black Cube also includes the external power supply and its cable.

While Installing the Black Cube

- Be careful to use an appropriate cable for the connection between your power outlet and the Black Cube external power supply. Make sure that you have the appropriate version for your mains voltage.
- Be careful to prevent the Black Cube from getting wet; do not allow water to enter the Black Cube, especially when raining or snowing, or near a body of water. Otherwise fire or electrical shock may result.
- Do not place heavy objects on the power cord. If the cord is damaged, fire or electrical shock may result. In particular, it is possible that one might accidentally place a heavy object on a carpet that covers the cord; definitely avoid these situations!
- Do not install the Black Cube in a place where it might be exposed to oil, smoke or steam (for example, near a cooking table or humidifier). Otherwise, fire or electrical shock may result.
- Do not place the Black Cube on an unstable surface, such as an unstable bench or slanted surface. Otherwise, the device may fall or drop, resulting in an injury.
- Do not place the power cord near a heating device. Otherwise, the cord sheath may melt, resulting in fire or electrical shock.
- Do not locate the Black Cube in a place subject to excessive heat, such as inside a car with all the windows closed, or in direct sunlight. Otherwise, fire may result.
- Do not handle the power plug with wet hands. Otherwise you may receive an electrical shock.
- When you remove the power plug, be sure to hold the plug. Never pull on the cord. Otherwise, the power cord may become damaged, resulting in fire or electrical shock.
- The Black Cube offers superb sonic quality. To ensure best possible results, you should use the best quality connecting cables that you can afford. Regular maintenance involves keeping all connections clean using a quality contact cleaner.

Using the Black Cube

Do not touch the Black Cube under the following circumstances:

- If you hear thunder, remove the power plug from the AC outlet as soon as possible. If you fear a lightning hit and the Black Cube has been connected to an AC outlet, do not touch the power plug. Otherwise you may receive an electrical shock.

- Do not attempt to modify this equipment. Otherwise, fire or electrical shock may result. Warranty is void on modified devices. Exceptions: dip switch settings, fitting of custom input load and upgrading with the PWX power supply when done carefully by a skilled person (trained technician). Normally this is your dealer.

- If you think the Black Cube needs to be checked for maintenance or repair, consult your dealer.

- Do not place a container of water or any small metal object on top of the Black Cube or the external power supply. If water is spilled or if the metal object gets inside, fire or electrical shock may result. This applies to vases, potted plants, glasses, cosmetic bottles, medicine, etc. Do not change the setting of the dipswitches with any tools that consist of metal.

- Do not damage, process, bend, twist, stretch or heat the power cord. If the cord is damaged, fire or electrical shock may result.

- When you are connecting other audio devices to the Black Cube make sure that you first turn off the power to all devices to be connected. Refer to the user's guide for each device and use the specific cable for connection.

- Set the volume levels of all devices to minimum before connecting the Black Cube to your actual setup and to the AC outlet. Otherwise, an extremely loud noise could damage your loudspeakers or even your hearing.

- If you plan not to use the Black Cube for a long period of time (such as when you are on vacation), remove the power plug from the AC outlet. Otherwise, a fire could possibly result.

If any abnormality occurs while using the Black Cube, remove the plug from the AC outlet. In this case first shut off the power amplifiers or turn down the volume controls and so on to avoid possibly damaging transients

- If you notice any abnormality - such as smoke, smell, noise, etc. - remove the plug from the AC outlet. Confirm that the abnormality is no longer present, then consult your dealer for repair. If you continue using the Black Cube under abnormal conditions, fire or electrical shock may result.

- If a foreign object or water enters inside the equipment, remove the Plug from the AC outlet and consult your dealer for repair. If you continue using the Black Cube under this condition, fire or electrical shock may result.

- If the power cord is damaged (for example if it is cut or if the core wire is exposed), ask your dealer for a replacement. If you continue using the Black Cube under this conditions, fire or electrical shock may result.

- If the Black Cube or the external power supply is dropped, or if the case is damaged, remove the plug from the AC outlet and consult your dealer. If you continue using the Black Cube under abnormal conditions, fire or electrical shock may result.

Maintenance

- Before cleaning the Black Cube, remove the power plug from the AC outlet for safety. Otherwise, an electrical shock may result.

- Do not open the external power supply of the Black Cube. There are hazardous voltages inside that might result in an injury or an electrical shock.

Description

The passive filter network of the Black Cube is located between two linear active amplifier stages. Phase errors that occur due to active filter designs are thereby eliminated. Low-loss, low-tolerance WIMA foil capacitors in the filter network are responsible for very good localization and soundstage reproduction.

Sensitivity for 250mV/eff. output voltage: 0,21mV/2,2mV switchble on board (MC/MM). Input capacity: 220pF default, input impedances: 47 kOhms/ 470 Ohms/100 Ohms switchble on board (Dip-switches with gold plated contacts), one slot for solder free installation of custom impedance on the printed circuit board (*PCB*). One custom impedance for the adaption of your favourite system will be supplied without extra cost when ordered with Black Cube. No need for expensive impedance plugs!

Output impedance: <100 Ohms

Gold plated RCA-connectors, massive ground connector

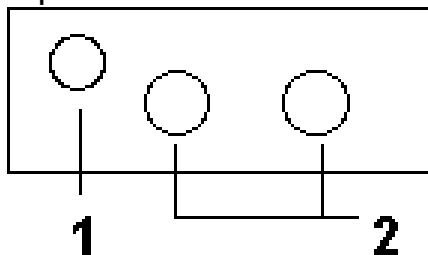
The external regulated power supply of the Black Cube can be placed up to two meters away from the audio section. The cable between power supply and audio section is shielded to keep Radio Frequency Interference (*RFI*) away from the nearly noiseless and highly stable supply voltages. This effect is even enhanced by additional supply voltage filtering on the double-sided audio pcb.

Case of 1,5mm aluminum protects the audio electronics.

Please read this manual first before connecting the Black Cube to mains voltage!

Connectors: (simplified)

Input side:



1. Ground connection (GND)

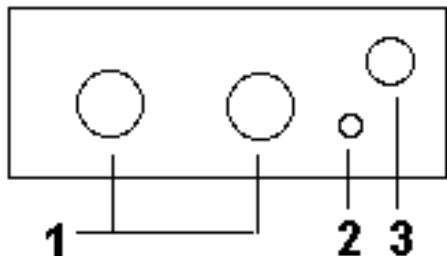
If your turntable has a separate ground cable you should connect it here. You can connect any of 4mm plugs, open ends, or cable shoes

2. Signal input connectors (IN)

Please connect your turntable's output here. To minimize loss in the interconnect use the shortest possible cable between tonearm and the Black Cube.

Be careful to preserve correct channel connections – left to left and right to right.

Output side:



1. Signal output connectors (OUT)

RIAA-filtered high-level output. Please connect your output cables to the line input to be used. For example, to a line-level preamplifier, active loudspeakers with volume control or power amplifier input with volume control.

Be careful to preserve correct channel connections – left to left and right to right.

WARNING: You must not connect the output cables to a following phono input because RIAA-filtering and amplification would be done twice! You could damage the following phono stage or your power amplifier and loudspeakers! The resulting noise could even damage your hearing!!!

2. Control (LED)
3. Input for the external power supply

If you have the SE-Version please connect the power supply to the audio section first and then connect the complete unit to mains voltage!

Matching of gain and input impedances

You can change input impedance (loading) and gain by using the onboard Dual Inline Package (*DIP*) switches for each channel separately. These switches are accessible from the bottom of the unit. You may change the setting of the switches with the Black Cube connected to mains voltage and even to your stereo system however in that case please turn your volume knob to the minimum position because loud pops could occur during switching.

DIP switch Table

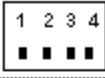

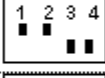



No.	<i>gain</i>		<i>/ input load</i>	
	1	2	3	4
ON	(MC)210 μ V Gain = 61dB	470R	free (for custom load)	100R
OFF	(MM)2,2mV Gain = 40dB	/	/	/

The Black Cube is high flexible and also offers an insert point (slot 3) for inserting a resistor to accommodate cartridges which require special loading. Before you insert a custom load please do the following:

- Disconnect the power from the Black Cube's power supply.
- Place the Black Cube on a clean smooth surface.
- Carefully unscrew the four screws of the audio board's case with the tool included with the Black Cube
- After removing the top you can now insert your custom input load for each channel. Do not use any tools that could damage the electronic circuit. Please use high quality metal film resistors.
- The DIP switches are now accessible from the outside at the bottom of the unit near the input RCA connectors. To activate your custom load you have to set the switches no. 3 to the "on" position.

Use only high quality resistors for custom load impedances. Install these resistors only if you know what you are doing. Otherwise please consult your dealer.

Common configurations:

Cartridge	1	2	3	4	View
MM/47 kOhm	OFF	OFF	OFF	OFF	
MC/47 kOhm	On	OFF	OFF	OFF	
MC/470 Ohm	On	On	OFF	OFF	
MC/100 Ohm	On	OFF	OFF	On	
MC/80 Ohm	On	On	OFF	On	
MC/***	On	OFF	On	OFF	

*** = Custom load

If all the switches are in the off-position, then the input sensitivity is 2.2mV and the input impedance 47kOhms. This is fairly standard for many MM phono cartridges. Dipswitch 1 controls the gain stage and can be moved to the "on" position to achieve higher amplification for a MC cartridge. Switching only switches No. 1 to the "on" position might be suitable for some low output MMs or some high impedance MCs. You can also reconfigure the impedance switches to achieve MM/ 470 Ohms for some high output MC's.

Impedance switches connect the resistors in parallel. Therefore if you turn switches 2 and 4 "on" you will get a resulting impedance of 82 Ohms. By adding a special resistor of your choice in slot 3 the possibilities of system matching are virtually unlimited. If you have a cartridge that needs a special input impedance please contact your dealer to have it installed or do this yourself when you are a trained technician.

After changing the gain and/or impedance to the desired values, please replace the top cover making sure of the correct orientation (use the ground input as your guide). When you have secured all of the screws, the Black Cube can be reconnected to your music reproduction system and to mains.

Of course both channels must be configured identically!

If any question occurs or if you are uncertain about the gain or impedance needed, please contact your local dealer.

Technical Data

<i>Input sensitivity:</i> for output level of	MM	MC
250mV/-10dB	2,2mV/1 kHz	210µV/1kHz
755mV/ 0dB	7mV/1 kHz	680µV/1kHz
1,55V/ +6dB	14mV/1 kHz	1,35mV/1kHz
<i>Gain 1kHz</i>	40dB	61dB
<i>Max. input level1kHz:</i>	63mV	5,8mV
<i>S/N-ratio:</i> unweighted referred to 0dBu	77dB	69dB
CCIR 468-2 referred to 0dBu	75dB	67dB

Channel deviation: typ. max. 0,5dB

Channel crosstalk: fx = 1 kHz > 86dB
fx = 10 kHz > 85dB

Input impedances: 47kOhms/470 Ohms/100 Ohms switchable on board the audio PCB. One place for custom impedance on board the audio PCB

Input capacitance: 220pF

Output impedance: < 100 Ohms

Impedance following stage: >10kOhm recommended

Measures: WxHxD (case only) 114mm x 44mm x 108mm

Power consumption: approximately. 3VA

External power supply output voltage: 2x15VDC (standard power supply)

Notes

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