



Black Cube SE II

High End MM/MC phono stage

manual

Valued customer,

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

This unit is made only for being inserted between a turntable's passive cartridge output and any audio amplifier's high level input. The Black Cube SE II 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 SE II so that you can refer to it for further use.

Precautions

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

While Installing the Black Cube SE II

- Be careful to use an appropriate cable for the connection between your power outlet and the Black Cube SE II external power supply. Make sure that you have the appropriate version for your mains voltage.
- Be careful to prevent the Black Cube SE II from getting wet; do not allow water to enter the Black Cube SE II, 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 SE II 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 SE II 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 SE II 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 SE II 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 SE II

Do not touch the Black Cube SE II 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 SE II 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 when done carefully by a skilled person (trained technician). Normally this is your dealer.
- If you think the Black Cube SE II 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 SE II 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 SE II 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 SE II 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 SE II 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 SE II, 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 SE II 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 SE II 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 SE II under this conditions, fire or electrical shock may result.
- If the Black Cube SE II 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 SE II, 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 SE II. There are hazardous voltages inside that might result in an injury or an electrical shock.

Technical details

The passive filter network of the Black Cube SE II is located between two linear active amplifier stages. Phase errors that occur due to active filter designs are thereby eliminated. Low-loss, high precision WIMA MKP capacitors in the filter network and cor output coupling are responsible for very good localization and soundstage reproduction.

There is a hard wire Slot for switch free addition of extra custom impedance. This means there is no need for expensive impedance plugs!

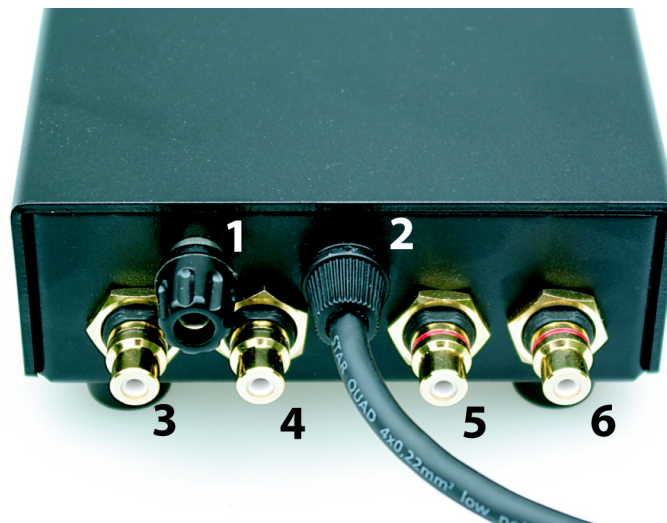
The low output impedance can drive long cable runs and the external regulated PWX power supply of the Black Cube SE II can be placed up to two meters away from the audio section. The cable between power supply and audio section is shielded to keep Radio Frequency Interference (RFI) away from the nearly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

A case of 2mm aluminum protects the audio electronics.

Made in Germany

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

Rear side (Connectors)



1. *Ground connector*

If your turntable has a separate ground connection you can connect it here.

- wire, open cable ends
- cable shoes
- 4mm banana plug

2. *Input for the external PWX power supply.*

The external PWX power supply is connected through a 2m shielded cable with an original Neutrik 4-pin XLR connector on one end. The PWX power supply will give much more authority, authenticity, liveliness, pace and timing to your turntable's music reproduction than the standard Black Cube power supply. There will be a deeper black in the background and a more holographic soundstage.

3. *Output Left Channel*

4. *Input Left Channel*

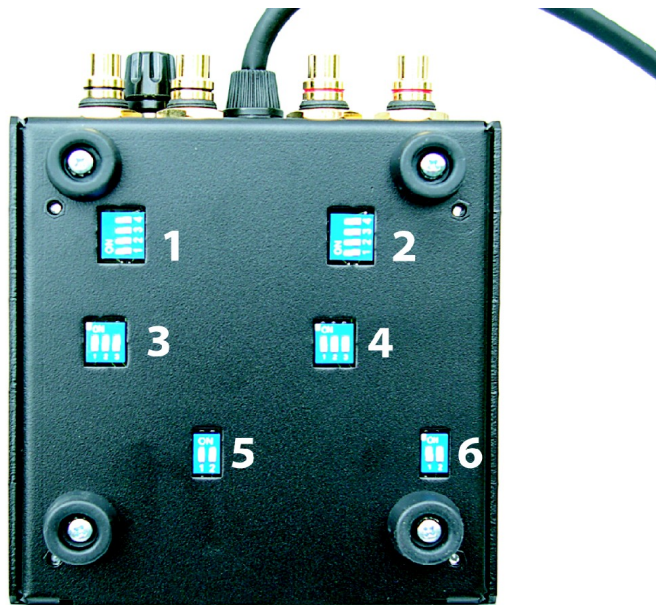
5. *Output Right Channel*

6. *Input Right Channel*

The outputs (3; 5) are RIAA-equalized line level outputs to connect either the line input of a preamp or directly to a power amp with volume control. Please take care for the correct channel polarity.

Please do not connect the outputs of the Black Cube SE II to a phono input of your amplifier. The RIAA filtering and the gain would be applied twice to the signal. Extremely loud signals could damage your loudspeakers or even your hearing.

Switches/configuration



DIP-Switches 1/2 (MM/MC-selection and input load)

	1	2	3	4
<i>On</i>	MC	1k	***	100R
<i>Off</i>	MM	-	-	-

Switch nr. 1 is for gain selection (36dB = MM; 56dB = MC)

switches 2 to 4 are for input load selection. Switch nr. 3 activates the special impedance slot. Please note that you can select gain and impedance independently. MC/High R is possible

DIP-Switches 3/4 (high gain and filter before the output stage)

	1	2	3
<i>On</i>	High Gain (+10dB)	23Hz	30Hz
<i>Off</i>	0dB	-	-

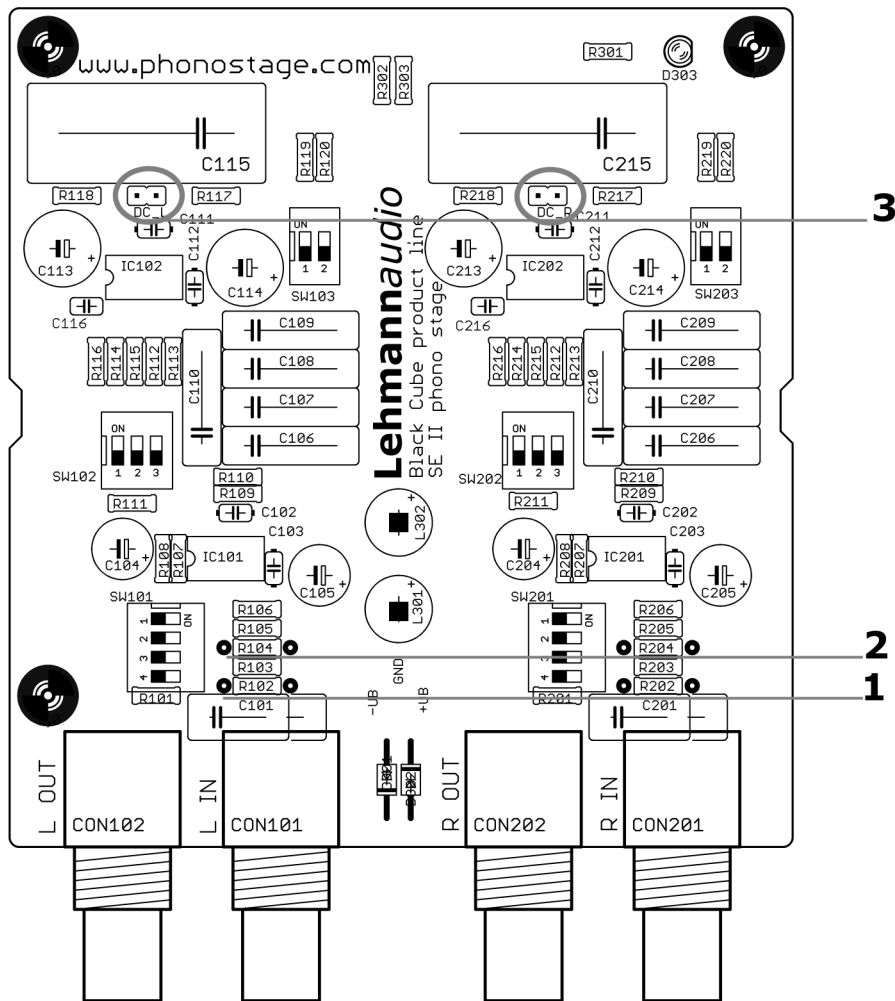
Without this filter the lower corner frequency here is roughly 7Hz. If both filters are activated the corner frequency is approximately 47Hz.

DIP-Switches 5/6 (filter after the output stage)

	1	2
<i>On</i>	27Hz	15Hz
<i>Of</i>	-	-

Without this filter the lower corner frequency here is roughly 0,3Hz. If both filters are activated the corner frequency is approximately 42Hz.

Top view audio section inside



1. Sockets for hardwire impedance loads

If you place resistors or capacitors at R102/R202 these parts are directly effective without any activation by a switch. These parts are always connected in parallel to the 47k input resistor, the 100pF input capacitor and any other impedance load activated by a switch.

2. Sockets for custom load

If you place resistors or capacitors at R104/R204 these parts become effective by activating switch number 3 of sw101/sw201. These parts are always connected in parallel to the 47k input resistor, the 100pF input capacitor and any other impedance load activated by a switch or placed in the hardwire sockets R102/R202.

3. Sockets for DC coupling of the outputs

DC Jumpers (and spare jumpers) are supplied. By activation of these jumpers the output capacitors are bridged. The DC jumpers are not activated as default.

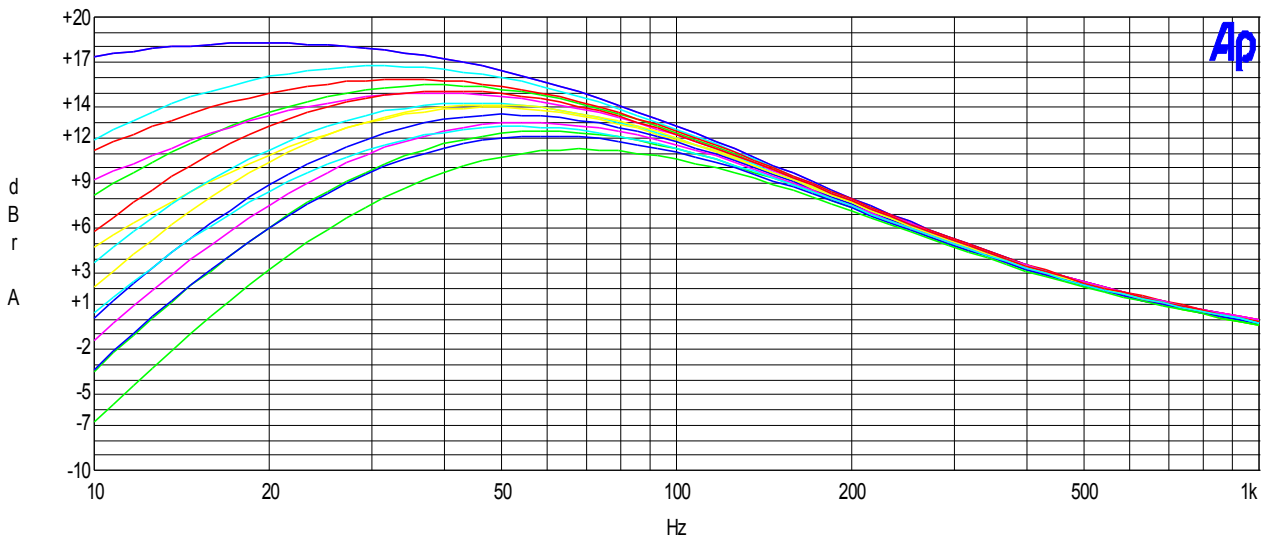
In case you activate the DC jumpers, the second filter stage (DIP-switches 5/6) cannot be used because the filter uses the output capacitor to determine the corner frequency.

WARNING: When the output capacitors are bridged there can be DC offset voltage present at the SE II's output connectors. Please make sure that the following input stage is AC-coupled before activating the DC jumpers. If you do not know the coupling status of the next following input stage have your setup checked by a dealer or avoid to use this jumper. DC at the output stage of a power amplifier can destroy loudspeaker chassis!

Possible filter curves:

Audio Precision

04/22/08 12:46:13



Sweep	Trace	Color	Line Style	Thick	Data	Axis	Comment
1	1	Magenta	Solid	1	Anlr.Level A	Left	
2	1	Blue	Solid	1	Anlr.Level A	Left	
3	1	Cyan	Solid	1	Anlr.Level A	Left	

Messung: Frequenzgang 20Hz bis 20kHz
Datei: aasfa.at2

phono_highpass_filter.at2

In the image above the RIAA bass boost in connection with the lower corner frequencies of the filters are shown.

All in all sixteen different lower corner frequency curves are possible by the several filter combinations. These curves are partly similar but always differ in details.

Please have in mind that especially with systems not capable of really reproducing frequencies below 60Hz the differences might be hardly audible!

Adaption of input impedance

You can change input impedance (resistive loading) and gain by using the onboard DIP-switches for each channel separately. These switches are accessible from the bottom of the unit. Input capacitance is always 100pF.

You may change the setting of the switches with the Black Cube SE II connected to mains voltage and even to your stereo system however in that case please first turn your volume knob to the minimum position because loud pops could occur during switching.

DIP-switch table for input load (DIP-switches 1 and 2 with four switches)

Nr.	2	3	4
ON	1K	***	100R

The **Black Cube SE II** is highly flexible and also offers an insert point for inserting a resistor to accommodate cartridges which require special loading to be activated by the switch and one additional hardwire slot for each channel for permanent installation with direct effectivity. In case you own a cartridge that needs special load adaption please consult your dealer to have him install this special impedance. High quality metal film resistors are recommended for sonic reasons. In case you want to install a custom impedance yourself please proceed as follows:

- Disconnect the power from the **Black Cube SE II's** power supply..
- Place the Black Cube SE II on a clean smooth surface of sufficient size and without any sharp edges that could harm the unit.
- Carefully unscrew the six screws of the audio board's case with the tool included.
- 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 only high quality metal film resistors.**
- The custom load can now be activated the DIP switches that are 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.

If all impedance switches of DIP-switch nr. 1 are in the OFF-position the input impedance is 47kOhms which is suitable for most MM cartridges. The gain switch can be activated separately so that MC/47k becomes an easy option. This is recommended for some MC cartridges. Please refer to your cartridge's information sheet for the recommended load. If you only know the internal impedance of your cartridge you can use the rule that the load impedance should not be less than 10x the internal impedance of the cartridge.

Both channel settings and impedances have to be identical!

Important: The impedance switches connect the selected impedance in parallel to the 47k Ohms resistor. So the highest custom load that can be realized is always lower than 47k Ohms. Install these resistors only if you know what you are doing. Otherwise please consult your dealer.

Technical Specs:

	MM	MC
Gain 1kHz:	36dB	56dB
With activated high gain switch	46dB	66dB
Max. input level 1kHz ¹ :	120mV	12mV
Signal to noise ratio ² :	78dB	69dB
Soft-Bass-Rolloff:	16 filter curves between 7Hz and 90Hz (-3dB point)	
Channel balance:	Max. deviation of the stereo channels typ. 0,5dB	
Crosstalk:	fx = 1 kHz <-86dB fx = 10 kHz <-80dB	
Input impedance:	47kOhms/1kOhms/100 Ohms switchable on board the audio PCB. One place for custom impedance on board the audio PCB. One additional hard wire slot for direct effectivity. No soldering required.	
Input capacitance:	100pF	
Output impedance:	47 Ohms	
Dimensions:	WxHxD (case only) 114 x 44 x 124mm	
Power consumption:	max. 3VA with external PWX power supply	
Mains voltage:	240V AC	
Fuse:	250mA slow or T	

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¹ Without activated high gain

² With activated high gain = worst case