

Lehmann Black Cube USB (£1050)

Uniform with Lehmann's upmarket phono stages, the Black Cube Linear has no frills, no additional digital inputs or upsampling options, but it does pack a lot of functionality into that slim box.

On the back are USB inputs and analogue inputs, plus another pair of RCA phonos to give variable-level line output. There is also a fixed-level loop output, on a 3.5mm mini jack, which simply provides a pass-through from the analogue inputs and so will not give an output from USB sources.

At the front, the volume knob that controls the two headphone jacks also controls the line output level. Plugging headphones into the left-hand jack automatically mutes the variable line output, but not the 3.5mm loop output. No source selection switch is provided or needed, because when a music file is played via USB, it simply over-rides and mutes any analogue input.

There are no fascia legends to tell you any of this, but as usual with Lehmann, connections are identified by labels underneath. When connected to a computer's USB port, the Lehmann's internal DAC is identified by the system as 'Burr-Brown Japan PCM2702'.

TANGIBLE PRESENCE

Listening via USB, with 'Perfect Fit', not only did the voice have more presence than with the Chord, but all the instruments seemed punchier and more dynamic. The big bass drum boomed, sticks and percussion effects crackled impressively. Looking for subtleties, it did not have the comfortably rounded body of the Musical Fidelity, or the spatial impact of the Aqvox, yet it seemed essentially truthful.

With Brubeck's 'Take Five,' for whatever reason, I felt

RIGHT: One of the two headphone jacks gives auto muting of line output. Source selection is also automatic, USB signals over-riding the analogue input

that the Lehmann just brought Paul Desmond's alto sax to life in a more convincing way than the Chord. It was also excellent on Morello's complex cymbal sounds.

Ry Cooder's 'Little Sister' had the Lehmann thumping out a beefy bass sound, a contrast to the lighter balance of the Chord or Firestone. This track sounded punchy, but didn't really show the Lehmann to its best advantage.

On CD via the line input, the Lehmann always sounded smoothly revealing, detailed and well balanced. With 'Perfect Fit' it gave a good feeling of realism to the vocal, a feel of the studio acoustic.

With *Jazz At The Pawnshop* the Lehmann sounded great on the atmospheric opening, really conveying the distinct sounds of the band members and audience, and realistically presenting the hazier buzz of very low-level audience noise, which gives you the ambience of the venue. On the music proper, there was a good feeling of solidity and tangibility, with Arne Domnerus's clarinet firmly in focus at the centre of everything and a beautifully ringing sound to Lars Erstrand's vibes. The bass could sound a little heavy, though.

Sound Quality: 80%

0 - - - - - 100



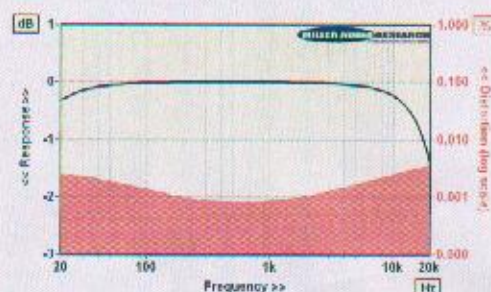
RIGHT: Along with the USB port there are phonos for input and variable-level (preamp) output. A space-saving 3.5mm mini-jack gives analogue loop output



HI-FI NEWS LAB REPORT

Identified as using the ubiquitous Burr-Brown PCM2702 DAC supporting isochronous USB, the descriptor suggests its implementation is by Onkyo no less. This DAC is buffered by one of Lehmann's preamp modules to deliver a full 1Vrms in '0dB gain' mode through a usefully low 70 Ω impedance. The response is tailored to -1.4dB/20kHz with CD and 48kHz data [black trace, below]. There's no advantage with 96kHz files as these are downsampled to 48kHz by the USB input.

Otherwise, Lehmann's 0dB mode is preferred over its +10dB/+20dB modes, offering lower distortion and noise, although the 90dB A-wtd S/N ratio is compromised by the intrusion of hum and switching harmonics radiating up to 700Hz. Nevertheless, distortion is impressively low at 0.0014% on the left and just 0.0005% on the right – not the first time we've seen a channel asymmetry from Lehmann. More importantly perhaps, the PCM2702 employs BD's SpAct architecture, recovering the audio clock from USB packet data with the minimum jitter. A 520psec figure for 48kHz data is good for isochronous USB. PM



ABOVE: USB in/headphone out frequency response [black trace] with distortion vs. frequency (red infill) at -10dBFS

| | |
|---------------------------------------------|-----------------------------|
| Max. headphone output level/Impedance | 1.0Vrms (0dB) / 70 Ω |
| A-wtd S/N ratio (USB in, 2V out, re. 0dBfs) | 89.8dB |
| Digital jitter (USB in, 48kHz) | 515psec |
| Distortion (USB in, 20Hz-20kHz, -10dBfs) | 0.0008-0.0035% |
| Frequency response (USB in, 20Hz-20kHz) | -0.5dB to -1.4dB |
| Stereo separation (USB in, 20Hz-20kHz) | 33dB-105dB |
| Resolution @ -90dB | \pm 0.6dB |
| Power consumption | 7W |
| Dimensions (WHD) | 110x44x280mm |

How to get ahead...

The Lehmann Linear USB headphone amp

by Alan Sircom



The Sennheiser HD800 is a wonderful and demanding beast. When we tested it in Germany, the headphone amp used was the Lehmann Black Cube Linear. With a total output power of 200mW into a 300 ohm load, a claimed THD of less than 0.001% at 6mW/300ohms, a signal to noise ratio of more than 95dB at 0dB gain plus a very flat frequency response from 10Hz up to 35kHz, the Lehmann Linear is a perfect match for the new flagship headphones. If it's good enough for Sennheiser...

We got the Linear USB version in for testing. As the name suggests, this adds USB connection and a Burr-Brown DAC. It auto-detects signals (defaulting to the analogue input) but it cannot power a USB device.

On the underside of both the Linear and Linear USB are three DIP switches that allow you to select the output gain for more or less efficient headphones (the options are 0dB, 10dB and 20dB). The impedance remains constant at 47kOhms, with a five ohm output impedance for headphones, and a 60 ohm for line out. We left the DIP switches 'as is', although the relatively sensitive HD800 meant the 27mm ALPS volume pot behind the milled aluminium knob was most commonly at the first third of its travel. The rest of the

deceptively-heavy Linear USB box – it weighs a little over 1.5kg - is taken up with a beefy (given the slim and small size) transformer and a very well engineered Class A output stage, that dissipates just five watts. The built-in power supply means there's no need for an external PSU box and the headphone amp is fed by a standard IEC three-pin mains lead.

There's the obligatory blue LED, of course, next to the two 6.35mm headphone sockets and a volume control. The rear panel is tiny, with just two sets of gold-plated phono sockets, a USB connection and a power supply block. So tiny in fact, the connection instructions for the Linear USB are printed on the baseplate. That's it; no remote, no balanced connections (although XLR features in the pro version).

In terms of sound quality, it's the perfect partner for the Sennheiser HD800. It's rugged, can drive to very high levels without distortion or complaint, it's tonally neutral, dynamic, fast and very, very detailed. Take away the HD800 and replace them with more humble cans (Sony MDR-7506, Grado SR-60 mk II) and the same detailed and accurate presentation follows across. As does the ability to go really loud without complaint – in short, the Lehmann s the perfect headphone partner.

There are better headphone systems, but they cost a lot more. We're talking Grace Design's m902 Reference D/A headphone

amplifier. The Grace has even more openness, expansiveness and clarity. However, it also has relatively low gain and you need to get close to the end of the dial to hear at anything approaching real-world listening levels. And that means we're happy to proclaim the Lehmann Linear USB as the perfect HD800 partner, for those who don't want to spend almost twice as much on the headphone amp as they did on the headphones. ➕

TECHNICAL SPECIFICATIONS

Lehmann Black Cube Linear USB
Type Headphone Amplifier/USB DAC
Maximum gain . . . 0dB, 10dB, 20dB
(switchable underneath the unit)
Input impedance 47 KOhms
Output power. . . 200mW/300 Ohms
400mW/60 Ohms
Output impedanceline out 60
. Ohms
. phones out 5 Ohms
Channel separation. . . >70dB/10kHz
Dimensions (WxHxD).
110x44x280mm
Weight app. 1.5 kg
Front panel colours . silver or black
anodized aluminium
Price (Linear). £650
Linear USB £900

Manufacturer

Lehmann Audio

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