

# Leema Acoustics Libra

Forming the heart of a modern high-end system, this tech-savvy DAC/preamp offers a wealth of facilities, plus an upgradeable digital section with performance to spare  
 Review: **Nick Tate** Lab: **Paul Miller**

The 2014 acquisition of Leema Acoustics by Welsh electronics manufacturing specialist Davlec has enabled its company founders Lee Taylor and Mallory Nicholls to spend more time at their real passion in life: working on design.

This new £5995 Leema DAC/preamplifier is a case in point – it's a sophisticated product that's seeking to compete in the increasingly popular sub-£10k high-end market. The Libra forms part of the company's flagship Constellation series, in which the finest possible performance is sought. Certainly, the product is superbly presented, with a welcome absence of the chintz of some potentially rival offerings.

## REPLACEABLE DAC MODULES

The Libra is an interesting hybrid – a complex product with a wide range of options and configurability – as you'd expect from Lee and Mallory, both ex-BBC sound engineers. The unit is essentially a dual-purpose DAC and analogue preamp, although it can be set to run as a DAC only, with a fixed line output toggled from a recessed rear switch.

The rather hackneyed phrase 'high resolution digital hub' is used in the promotional literature, but in all fairness – with the ability to work with a wide number of sources – that's just what it is, and arguably more...

Unlike many rivals, the Leema is potentially future-proofed by its field replaceable 'Quattro Infinity' DAC modules, which can be swapped out if new consumer technologies emerge. Currently, the Libra boasts compatibility with a very wide range of hi-res music files, including DSD64/128 and DXD via both its USB and rare I<sup>2</sup>S inputs, the latter via RJ45 connections. DSD64 is also supported via

all S/PDIF (three sets of coaxial and optical) and AES/EBU inputs.

Leema's so-called 'M1' USB module supports asynchronous computer audio playback via Windows (a driver disc is supplied, and is also downloadable via Leema's website), OS X and Linux machines, and sports full galvanic isolation to reduce circulating noise from computers. The Libra also works as a three-input analogue preamplifier, on either RCA or balanced XLR connections. Indeed, Leema says that the entire signal path (both digital and analogue) is fully balanced. When set to work as a preamp, the position of the 248-step volume control is shown on the large, backlit LC display along with the sampling frequency and bit depth of digital inputs.

There's also full LIPS (Leema Intelligent Protocol System) integration so the unit can control Leema Acoustics' range of power amplifiers directly. All Libras now come with a Bluetooth interface as standard, and there's a headphone amplifier and associated 3.5mm socket on the fascia too.

The Leema is generally very pleasant to use. The main controls have a silky-smooth action, yet feel distinctively different from the unit's rivals nonetheless. The backlit LC display is slightly less impressive. Although reassuringly informative it's a little cluttered and, despite having adjustable brightness, lacks the easy readability offered by some comparable products – its viewing angle is just too narrow.

The quality of the metalwork is excellent, its matt finished alloy being finely surfaced and well-fitted – just like Leema's Tucana amplifier and Antila CD player siblings [both *HFV* Nov '07]. The supplied remote control also gets a thumbs-up for being made of chunky alloy and feeling superb to the touch.

Leema's large LC display also allows the user to configure a number of settings. One press of the menu button calls up the 'basic settings' menu where you can set absolute phase, define the analogue filter bandwidth and the LCD brightness, as well as configure the CD and home theatre inputs, and cause the unit to drop the



**RIGHT:** A linear PSU feeds proprietary fully balanced 'Quattro Infinity' dual-mono DAC modules [see boxout, p61] and the Thesycon driver-based 'M1' USB module. The Bluetooth can be seen top right of this picture



volume while switching between sources. The 'Advanced' menu lets you name the inputs, edit the I<sup>2</sup>S input pins, set up the LIPS system and do a full system reset. The display can also be set to go off after a preset period of time.

The supplied Bluetooth antenna screws into a socket on the top left of the back panel – it's compact and can be easily rotated to ensure a good signal. Unlike the Bluetooth option on a number of modern DACs, I found this one worked superbly. After selecting Bluetooth as the source on the Libra, it took only a matter of seconds for my Apple iPad to discover it and pair with it, and after that it worked flawlessly over a long range, resolutely refusing to drop out. Sonically I don't find the format ideal, but nevertheless it worked so reliably that I found myself using it more than expected during the review period!

### EXCEPTIONALLY SPACIOUS

Unsurprisingly perhaps, the Libra has a distinct Leema 'house sound', which in this case is certainly no bad thing. It's an

*'It seduces rather than bamboozle with dramatic crashing sounds'*

interesting and distinct mix of insight allied to consummate smoothness. Even with 'old-fashioned' Red Book CD, you're offered a highly enjoyable combination of incision and detail, plus an even tonal balance with a surprising amount of colour.

The Leema doesn't have an overly rich or lush sound, but feed it with a warmer sounding recording and it's well able to signpost this. It is also able to convey the natural tone of the instruments in a way that few DACs, even at its premium price, seem able to achieve.

Take Simple Minds' 'Theme For Great Cities' on *Sons And Fascination* [Virgin CDV2207], for example. This is a murky early 1980s recording but the Libra seemed able to cut through the mist and let the instruments flourish. Drums had a distinct, tight and dry sound while the eerie synthesiser pads were recognisably those from a Roland Jupiter 4 from that era, and that funky bass guitar sounded meaty and physical – indeed, just as it should.

The Libra set up an unusually wide acoustic, which I remember being a

**ABOVE:** Either side of the dimmable display are a source knob, with menu and enter buttons, and a large volume dial. A headphone socket and MP3 input are also provided

characteristic of the Antila CD player too, this exceptionally spacious sound inviting the listener in. It sounds obviously less 'showy' than some rivals, preferring instead to seduce the listener rather than bamboozle them with a dramatic and crashing sound.

### RICH AND SUMPTUOUS

It's a more organic performance than most, yet is still infectiously propulsive and dynamically expressive. Steely Dan's 'Rickie Don't Lose That Number' from *Pretzel Logic* from 1974 [MCA 11917] showed this clearly: the interplay between piano and bass guitar at the beginning of the first verse felt unusually tactile, the Libra giving an acute sense of the body and the tone of both instruments.

Again, it was like being privy to the sound of the studio monitors as the recording took place, and certainly bears little resemblance to what you would normally expect from Compact Disc.

I preferred the 'wide' bandwidth filter setting [see Lab Report, p63] – which had a smoother and more even presentation through my system – but the sound was consistent whatever digital source was chosen, be it CD or a hi-res file via USB. With the latter, Kate Bush's 'Snowflake' [50 Words For Snow – Fish People FPCD007] showed the unit's mettle brilliantly. It's a rich and sumptuous 96kHz/24-bit recording, and the Leema didn't spoil things one jot. Bass was commandingly powerful and yet lithe and tuneful too, while both vocal lines were superbly carried.

Kate Bush's voice in particular was rich with harmonics yet never sounded artificially warm or over-smooth. This song also showed the Leema's fine soundstaging – again, almost cathedral-like in its scale, 

## TO INFINITY AND BEYOND

Inspired rather less by Buzz Lightyear than the multi-DAC conversion regime first unveiled in its Antila CD player [HFN Jun '07], the 'Quattro Infinity' DAC modules featured in the Constellation-series Libra use pairs of converters to improve performance. A custom FPGA separates positive and negative phase data in the digital domain and addresses this as a serial stream to a total of two stereo DACs per module (per channel). These DACs are buried under the black heatsinks that you can see in our inside shot, p60. In practice, each stereo DAC handles one phase of either Left or Right data, with data blanking to remove Right data from the Left chips and Left data from Right chips. Hence 'Quattro Infinity' or four DACs offering 'infinite separation' between left and right channels – in the digital domain at least! Incidentally, as these DACs handle LPCM only, a separate Cirrus Logic CS4392 is used per module for DSD conversion. In practice, the Libra offers a superior low-level resolution than might typically be achieved with just one stereo pair of these DACs although some technical parameters, including its rejection of digital alias 'images', are unchanged [see Lab Report, p63]. PM

# USB DAC/PREAMP

# LAB REPORT

## LEEMA ACOUSTICS LIBRA



**ABOVE:** The Libra has 12 digital inputs: Bluetooth, USB, 2x AES/EBU (XLR), 2x I<sup>2</sup>S (RJ45) and six S/PDIF (3x RCA and 3x Toslink optical). It has three analogue ins on RCA and balanced XLR connections plus single-ended (RCA) and balanced XLR outputs

especially left to right, although it dropped back a long way as well.

The Libra shows no favouritism towards any specific musical genre. The sparse electronic sounds of Kraftwerk's 'Techno Pop' [*Electric Café* – CDP564-7 46420 2] was exposed for all to hear, yet it never grated. It was crystal-clear and well-etched, yet it didn't sound as if the Leema was doing a forensic investigation at a crime scene – instead it preferred to get into the swing of things and enjoy the track's sinuous rhythms.

Indeed, the Libra's ability to shuffle its feet with the best of them was never more apparent than with the strains of Donald Byrd's 'Lasana's Priestess' from *Street Lady* [EMI BlueNote CDP 7243 8 53923 2 0] where it really got into the groove of this soulful song.

### MIDBAND DELIGHTS

As I have suggested, the Libra's Bluetooth input was an unexpected surprise, offering up a clean and enjoyable sound which – while obviously not up to CD standards – in fact proved highly listenable. The Leema's innately subtle, textured and even sound must have helped here, eking every last bit out of the compressed digital datastream.

The Libra also proved excellent as a preamplifier too. Via its balanced inputs it was surprisingly unobtrusive. Cueing up the first movement of Beethoven's *Pastoral Symphony* with Karajan and the Berlin Philharmonic Orchestra [DG SLPM 138 805], the music on this LP from 1962 ran far left and right with a wonderfully capacious soundstage. The midband was a delight,

communicating large amounts of detail about the ambience of the Jesus-Christus-Kirche setting without sounding overly analytical or matter of fact – once again we come back to its innate, organic musicality.

Bass was taut and firm with real body, giving a tangible and textured sound to cellos, and at the opposite end of the range the treble was superbly atmospheric and extended.

Overall, even when it is working purely as a digital converter, Leema's Libra gives little or nothing away to its rivals at or near its price. Its special mixture of forensic levels of detail and an easy, organic musicality is truly beguiling. It has the openness of a top piece of studio equipment with a natural ease and enjoyability that hi-fi enthusiasts crave.

The really telling thing is that despite the price differentials, it compares well with the dizzy heights of the entry-level super-DACs from the likes of dCS and MSB. It sounds just as convincing in its own way, and you keep coming back to its glorious evenness, subtlety and grace. The thing is, of course, the Libra is *more* than just a DAC... ☺

### HI-FI NEWS VERDICT

Leema's Libra offers great value. As well as an excellent DAC, it's a highly accomplished analogue preamp – you just need to add a phono stage and power amp to build a full system. The unit is superbly made (in the UK!), has an imaginative aesthetic, excellent connectivity and some useful convenience features too – from its LIPS integration to an excellent Bluetooth implementation. As a package, it's highly commended.

Sound Quality: 83%

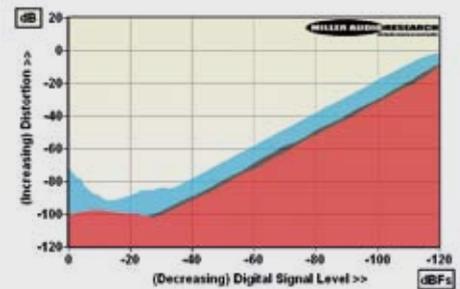


Tested via its variable balanced XLR outputs (*ie*, with the volume engaged), the Libra makes for a superb line-level analogue preamp. Capable of delivering a full 20V from a moderate 460ohm source impedance (rising to 630ohm at 20Hz), it offers a combination of low 0.0001-0.0002% bass/midrange distortion (rising to 0.0024% at 20kHz), a decent 92dB A-wtd S/N ratio (re. 0dBV) and a spectacularly flat and extended frequency response that stretches from 1Hz to 100kHz ±0.1dB.

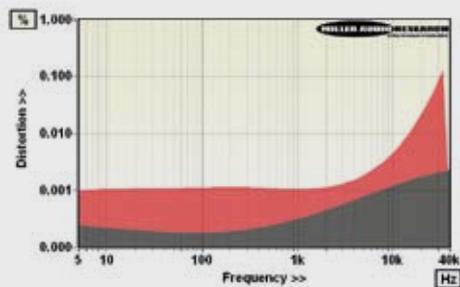
Its performance as a DAC fits within this envelope although with mildly superior results via USB than S/PDIF as the former's asynchronous operation demonstrates a lower jitter (<10psec) than the clock-recovery of its S/PDIF input (~250psec).

Tested via its *fixed* balanced output, the DAC section offers a maximum 4.15V at 0dBfs and a wide 111dB A-wtd S/N ratio and where distortion – through bass and midrange at least – remains a low and consistent 0.0006-0.001% over the top 30dB of its dynamic range [see red/black traces, Graph 1, and red trace, Graph 2]. There's some stress in the analogue output at peak frequencies/peak level, but the 0.026% THD at 20kHz quickly drops back to 0.003% at -10dBfs [blue trace, Graph 1].

The low-level linearity of Leema's 'Quattro Infinity' DAC modules [see boxout, p61] is excellent at ±0.2dB over a full 110dB range while the responses (in Leema's '82kHz filter' mode) are very extended: flat to within -0.02dB/20kHz (CD and 48kHz media), -0.4dB/45kHz (96kHz files) and -5.0dB/90kHz (192kHz files). Readers can view comprehensive QC Suite test reports for the Leema Libra's (analogue) preamp, (digital) S/PDIF and USB performance by navigating to [www.hifinews.co.uk](http://www.hifinews.co.uk) and clicking on the red 'download' button. PM



**ABOVE:** Distortion vs. 24-bit/48kHz digital signal level over a 120dB dynamic range. S/PDIF input (1kHz, red) and USB input (1kHz, black; 20kHz, blue)



**ABOVE:** Distortion vs. frequency showing analogue preamp (black) vs. digital input at 96kHz/24-bit (red)

### HI-FI NEWS SPECIFICATIONS

Maximum output level (Balanced)	20.0Vrms at 46-63ohm
A-wtd S/N ratio (pre / S/PDIF / USB)	92.1dB / 111.0dB / 110.9dB
Distortion (1kHz, 0dBfs/-30dBfs)	0.0009% / 0.0005%
Dist. & Noise (20kHz, 0dBfs/-30dBfs)	0.026% / 0.0065%
Frequency resp. (1Hz-100kHz, preamp)	-0.01dB to +0.01dB
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0 to -0.02dB/-0.4dB/-5.0dB
Digital jitter (48kHz/96kHz/USB)	160psec / 250psec / <10psec
Power consumption	19W
Dimensions (WHD)	410x110x344mm

