

Prism Sound Callia

This first 'home use' DAC from a British company with a long heritage in the pro-audio field appears to combine both a comprehensive specification and a sensible price
 Review: **Andrew Everard** Lab: **Paul Miller**

The reinvention of the audio industry around the increasing use of computer equipment as a playback source has brought with it a whole new mythology, not entirely distanced from the old saws that 'digits is digits' and 'it's all only 1s and 0s, after all'. Extending that thinking is the suggestion from some that everything sold as consumer hi-fi, from cables to audio components, is a rip-off, and that the real bargains are to be found in your local music shop or pro-audio supplier.

'HOME AUDIO' TOEHOLD

We've been here before, but of late we have seen a few companies best known for their pro-audio equipment dipping a toe in the hi-fi market, from the likes of Korg with its range of DACs to makers of active studio monitors. The latest is Prism Sound, a name probably unfamiliar to most readers, although *HFN* did review its Orpheus DAC way back in Jan '10. With a near-30 year heritage in professional audio, the company has now decided to give itself a toehold in the 'home audio' market, with the arrival of its £1495 Callia, a DSD-capable DAC/preamp.

Of course, the Callia is far from the first such device on the market, and most of the more familiar hi-fi names, from the high-end down to the more mass-market, have products of this kind, many of which have featured in these pages in recent times. But it must be said that, on paper at least, the Callia's specification looks highly competitive. It includes optical, coaxial and USB inputs, accepting signals at sampling rates all the way up to 384kHz and 32-bit as well as DSD64 and 128, and there's a choice of balanced XLR or RCA outputs, with a digital volume control to allow it to be used straight into a power amplifier or active loudspeakers.

RIGHT: With most of Prism's core 'XPlatform' code running on a Spartan-6 processor (lower large IC here) only the final switched-capacitor stage of the CS4398 DAC is employed (LPCM inputs). Note switchmode supply under screen

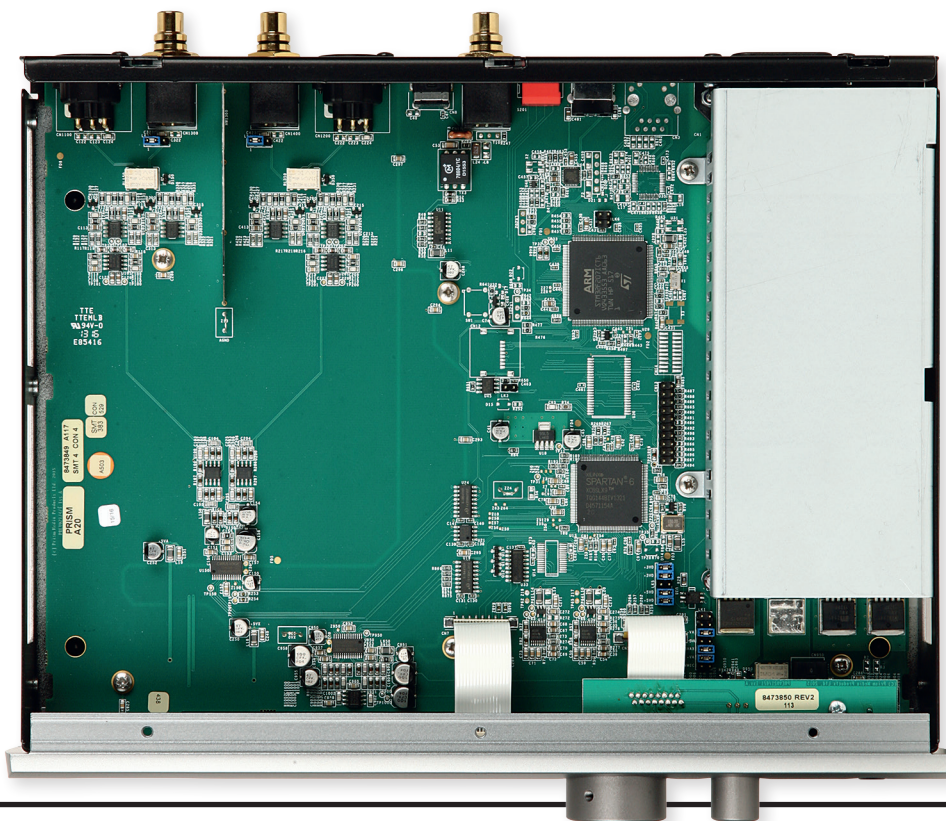
There's also a dedicated headphone amplifier built-in, complete with a 6.35mm (1/4in) socket, its own volume control and an adjustment for 'phones of different sensitivities and impedance as part of the functionality of a panel of DIP switches to the rear – of which more later.

Remove the Callia from its little suitcase packaging, and you're met with a relatively simple-looking device, finished in a style that's functional rather than flamboyant. Digital input selection is automatic, with the source in use indicated by a row of four blue LEDs, but there's also a manual override, operated via swift presses of the on/standby button on the right of the front panel, and I mean swift – hold the button for more than a second and the unit switches into standby! The auto-switching takes a few seconds between one input stopping and another being connected, purely to avoid it being confused by the gaps between tracks.

Also automatic is the digital format switching, with another bank of LEDs showing the format being received. These operate using three basic lamps, for DSD, 44.1kHz and 48kHz, plus 'x2' and 'x4' indicators, so for example a 192kHz input lights the 48kHz and x4 lamps, a 352.8kHz one the 44.1kHz, 2x and 4x tell-tales. There's also a lamp to indicate the word length of the incoming signal: unlit for signals of up to 16-bit, blue for 16-to-24-bit, and pink for those above 24-bit.

As the Callia deals with DSD by receiving it in DSD over DoP (*ie*, via LPCM) and not in native form, it can accept up to DSD64/2.8MHz via optical and coaxial inputs, along with LPCM at up to 192kHz/24-bit. For DSD 128/5.6MHz and LPCM through to 384kHz/32-bit, you need to use the asynchronous USB input.

On which subject, the Callia comes with a USB stick containing software for both Windows (Vista, 7-10 or later) and Mac OSX





(10.5 or later) computers, although our sample seemed to work happily without the Mac software being installed.

PRO HERITAGE

And that seems to be about it, apart from a hidden function of adjustable brightness for the LED indicators and rings around the main volume control and that for the headphones – push and hold the on/standby button, and this can be set using the line volume control. Meanwhile, the four DIP switches to the rear allow other adjustments to be made during set-up.

The first toggles the unit between fixed and variable output, allowing it to be used into a conventional amp as well as into power amps or active speakers, while the second adjusts between the default +3.1dB headroom when playing DSD streams and a 0dB setting, the latter lowering the noise floor but running the risk of clipping some transients.

The third and fourth switches control the gain of the headphone amp, with settings for 'phones below 32ohm, from 32-50ohm, and above 50ohm, and also

allow the user to choose whether the main analogue output is muted when headphones are plugged in.

But that's sort of the story here: the Callia may have been 'house-trained' a bit when it comes to its styling, but it's pretty much frill-free, with a simple IEC mains input precluding any jiggery-pokery with offboard power supplies, and a noticeable absence of a remote control handset. What you do get is user-updatable firmware: future versions can be downloaded from

the Prism Sound website and then loaded onto the unit via USB.

There's more detail from editor PM on what's inside the Callia in our boxout [below], but in general terms the new product draws heavily on the

company's professional range, from which it derives the layout of the signal path, the clock circuitry, the USB platform and the processor on which the unit runs.

The company also uses the same isolation techniques found in its pro units in order to shield the analogue output stages from noise in the digital section and computer interface, and the headphone

'You can almost feel the air around the musicians'

ABOVE: Front panel is simple and functional, with indicators for digital input and stream format; separate volume controls are provided for analogue out and headphone section

stage here is designed specifically for this device. Like other Prism Sound products, the Callia is made in the UK.

This isn't perhaps a unit you'll want to place in prime position on your equipment rack, unless you're going for a 'slightly civilised lab gear' aesthetic. I found the Callia looked best with its bright blue panel illumination dimmed down – after all, digital source and input format selection is all automatic, so once you have the unit set up, you really don't need those lights.

ATTENTION-GRABBING

The sound, however, requires no such 'light under a bushel' tactics to be employed for the Callia's presentation is instantly attention-grabbing, being packed with detail and information and having excellent clarity. As befits its studio heritage, it offers fine insight into even the most complex of mixes, and whether you use it straight into power amplification or as a conventional DAC into an amp or preamp, it maintains the same informative nature, only seeming to thicken up a bit when the variable

volume option is used and things are wound down to 'late night listening' levels.

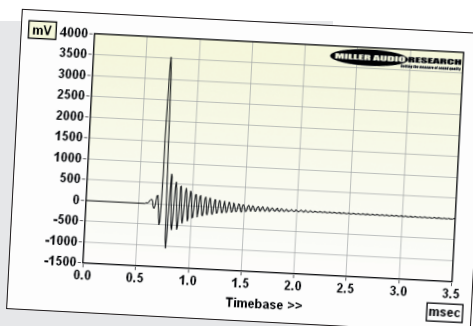
Even better for those without access to equipment with balanced inputs, the RCA outputs here are a very close match for the XLR connections. Yes, there's a slightly enhanced sense of punch and transparency with the latter, but the Callia is far from shabby when connected

using phono cables. Testing it via the excellent Rotel RA-1592 integrated amp [see p52] I drew the conclusion that it was a very close-run thing.

The ability of the Callia to get deep into a mix was tested with *Weekend Man*, the latest album from Swedish rockers Royal

CUSTOM CODE

Based on the in-house 'XPlatform' technology developed for Prism's professional 2/4-channel Lyra ADC/DAC, the new Callia features a deal of novel number-crunching. Don't be fooled by the tried-and-tested Crystal CS4398 DAC chip because all the Callia's LPCM inputs are first routed through a custom upsampling, filtering, truncation (to a few bits) and noise-shaping regime before being passed directly to the final switched-capacitor and filter stage of the DAC itself. The proprietary linear phase digital filter combines a greatly reduced incidence of pre-ringing (the acausal distortion that some have linked to 'digital sound') with a perfectly 'useable' 78dB suppression of stopband artefacts at the lowest 44.1/48kHz sample rates [see Graph, inset]. Incidentally, DSD inputs are decimated through filters to the same few bits required by this Crystal 'delta-sigma' DAC. The code is implemented in a Spartan-6 FPGA while an ARM microcontroller handles the USB traffic, with Prism drivers for use with PCs. PM



OUTBOARD USB DAC



ABOVE: Basic, but sufficient, input/output provision: DIP switches between S/PDIF and USB sockets adjust headphone settings and switch fixed/variable analogue out

Republic [Vertigo Berlin 06025 4767613 9], which has more than a hint of 'everything turned to 11' about it, and can sound rather dense and wearing when played through overwarm equipment, such as the super-smooth Aqua La Voce S2 'NOS DAC' [HFN Aug '16]. However, Prism Audio's Callia opens up the mix, allowing you to hear what each member of the band is doing, not to mention every word of vocalist Adam Grahn's lyrics (which is almost always a good thing).

A PALPABLE PRESENCE

In fact, with just about everything played through this DAC, the impression is of the sheer amount of information being unearthed, and that's as true with the close-miked jazz so beloved of hi-fi demonstrators as it is with a spot of full-band orchestral music.

If you like to hear every movement of a cymbal, every slide of finger on string or even the pedalling of a pianist, this is definitely one product you should hear, especially playing a set such as the latest album from Phronesis, *Parallax* [Edition Records EDN1070]. What's more, it delivers an almost palpable sense of presence with this kind of ultra-precise recording, to the point where one can almost feel the air around the musicians.

Similarly with large-scale recordings such as the self-released Rattle/Berlin Philharmonic complete Beethoven Symphonies in 192kHz/24-bit [BPHR 16009], the way the Callia lets you listen into the score and the performance is nothing short of remarkable for what is, in the great scheme of high-end digital, a fairly modestly-priced piece of equipment.

What's more, for those looking at this as the ultimate desktop audio solution, it's worth noting that the headphone amp section here is every bit as impressive as the main analogue output, and when dialled

up to maximum clout was more than capable of driving my preferred but demanding Oppo PM-1 headphones [HFN Jul '14] both cleanly and with total confidence.

If there's a 'but' here, it's that the sound of the Callia will be rather dry to some ears, and I have to admit I'd rather have a bit more warmth and generosity in the balance, even if that meant trading a little of that sparkling clarity. There are times when you wonder if you are listening more to the recording than the music, which at times I found a little distracting from my enjoyment of some pieces, and made me wish for something with just a spot more character and sense of performance.

One can hardly criticise the Callia for being too clean and neutral, but I can imagine some listeners finding it just a shade 'anonymous', and wanting something rather more flattering of their favourite recordings. That's one of the difficult balancing acts in hi-fi, and many a designer will tell you of products engineered for precision but which sound lacklustre. That's not the case here but, while acknowledging just how much Prism Audio has achieved with its first consumer product, I'd suggest an extensive audition before you decide whether it's for you. ⚡

HI-FI NEWS VERDICT

In a world of DACs costing many times its price, the Callia is a serious achievement for the money, and will deliver 'studio monitoring' levels of insight to a hi-fi system, while driving a wide range of headphones very convincingly. It's very 'hi-fi' and arguably slightly dry-sounding but, provided you are not dissuaded by its pro-audio looks, will reveal detail you never knew was in your recordings.

Sound Quality: 83%

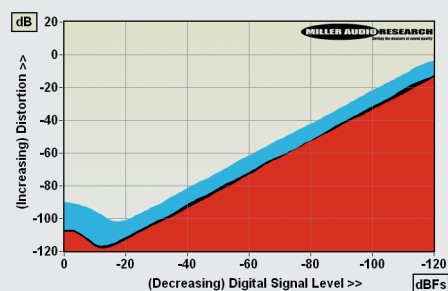


LAB REPORT

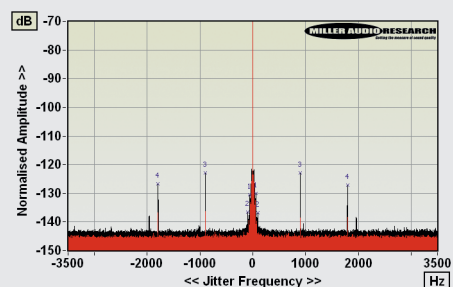
PRISM SOUND CALLIA

As is the case with many integrated USB DAC/headphone amp solutions, the Callia is a 'game of two halves' and both are extremely well-played indeed! Its performance as a DAC is largely defined by its custom conversion software [see boxout, p49], in the fashion of similar products from Chord Electronics or dCS, and here its (fixed) 3.9V balanced output is matched by a wide 112.2dB A-wtd S/N ratio. Distortion is vanishingly low and lower, indeed, than Prism itself specifies at just 0.0003% with peak 0dBFS inputs through bass and midrange, falling still further to 0.00009% at -10dBFS. Distortion increases at higher frequencies to 0.0025% at 20kHz/0dBFS but this reflects stress on the analogue output than any digital limitation as THD falls to 0.0016% at 20kHz/-10dBFS and then to 0.0004% at 20kHz/-30dBFS [see Graph 1, below]. Low-level linearity is superb with errors of just ±0.1dB over a 100dBFS range and is just +1.5dB adrift over a full 120dBFS range. Jitter is low – extremely so via USB at <10psec [see Graph 2, below] – while the response with 44.1kHz/48kHz sources is ruler-flat to within ±0.01dB from 20Hz-20kHz. Higher-rate 96kHz and 192kHz media roll-off only very slightly indeed at -0.3dB/45kHz and -4.8dB/90kHz.

The integrated headphone amp is very transparent: its response is unchanged over the XLR line outs with 44.1kHz/48kHz media and it is very quiet, offering a full 110dB A-wtd S/N ratio. Power output is 411mW/25ohm at 0.05% THD (0dBFS digital in) and 375mW/25ohm at just 0.0009% THD (-1dBFS). Distortion is typically just 2.5x higher over the top 20dB of its output or 0.0012% at 10mW vs. 0.0005% (loaded at 25ohm versus unloaded). Only the <50hm source impedance could, perhaps, do with being a little lower still. PM



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



ABOVE: High resolution jitter spectra with 48kHz/24-bit data via S/PDIF (black) and USB (red) inputs

HI-FI NEWS SPECIFICATIONS

Max. output level / Headphone	3.8Vrms / 411mW/25ohm
A-wtd S/N ratio (S/PDIF / Headphone)	112.2dB / 109.7dB
Output Impedance (20Hz-20kHz)	4.3-5.1ohm (Headphone)
Distortion (20Hz-20kHz, 0dBFS)	0.00026-0.0025% (XLR out)
Distortion (20Hz-20kHz, 10mW/25ohm)	0.0003-0.0032% (Headphone)
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0 to 0.0dB/-0.3dB/-4.8dB
Digital jitter (48kHz/96kHz / USB)	47psec / 45psec / <10psec
Power consumption	15W (1W standby)
Dimensions (WHD) / Weight	285x50x242mm / 2.1kg