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Lumin D3

Building on the earlier D2 platform, Lumin's equally compact D3 model features a new processor, new DAC, LeedH volume control and support for increased file sample rates
 Review: **Mark Craven** Lab: **Paul Miller**

It's not only loudspeaker brands playing the trickle-down technology game. Lumin's D3, its new entry-level streaming DAC, borrows liberally from the Hong Kong manufacturer's costlier network hardware, utilising elements both inside and out to effect a comprehensive upgrade on the previous D2 [HFN Jul '20]. Its maker says the D3 'brings the audiophile potential of music streaming within everyone's reach', and while the £2195 price tag makes that somewhat debatable, it certainly has plenty of appeal.

Firstly, there's the form factor. The D3 – like the D2 – measures a neat and tidy 30cm wide and 24cm deep and can be lifted from its box with one hand. From that moment on it continues to be easy to live with, helped by a slick custom app that handles both control of music playback and configuration of hardware settings [see boxout, p67]. A feature of all Lumin's streamers, and recently adopted in part by Audiolab's 9000N [HFN Mar '24], it puts some other rival streaming apps to shame.

PLATFORM CHANGE

The D3 occupies the entry position in Lumin's range of network player/DACs, below the £4195 T3 [HFN Apr '23], £8995 P1 [HFN Jul '22] and flagship X1, a two-box design with external PSU selling for £11,495. It's not the company's most affordable option, however, that being the U2 Mini, a transport-only streamer available for £1995. Lumin previously also sold an all-in-one streamer/DAC/amp, the M1, but this has been discontinued. There is still a power amp option, rated at 2x160W/8ohm and named simply 'Amp', but at £10,995 and twice the size it doesn't feel like a perfect partner for the D3.

As regards changes implemented for this third-generation model (the original D1 arrived in 2015), it might be simpler to

outline what hasn't changed. This includes the general aesthetic design, although the black or silver casework now gets the 'silky surfacing' finish introduced on the P1 and is entirely aluminium rather than incorporating steel elements. The small text-based info display is retained, showing track title, sampling rate, etc, just as the physical connectivity still comprises balanced and single-ended outputs, two USB-A sockets for connection of external drives, and a coaxial (BNC) output, all tucked into the rear panel.

Beyond that, Lumin has completed a substantial overhaul of its D series model, building it around the new hardware/software platform seen in the T3 where 'increased processing power and storage capacity provide greater resampling flexibility and future-proofing'. This means resampling now extends to DSD256 and 384kHz PCM, versus the DSD128 and 192kHz of the D2, and the D3 will also handle those

new higher sample rates natively thanks to Lumin upgrading its dual-balanced DAC architecture to one of the ESS solutions (the ES9028PRO in this instance).

ODE TO JOY

In the D3 this DAC stage feeds into a newly designed analogue output utilising buffer technology from the flagship X1. Furthermore, the streamer gets a LeedH digital volume control – a third-party system developed by Gilles Millot (www.acoustical-beauty.com) and present on other contemporary Lumin models – that was absent from the D2 at launch.

As well as the resampling mentioned earlier (plus PCM/DSD transcoding), the latest streaming/processing platform introduces MQA support (full/core decode and passthrough), Tidal Connect and Spotify Connect, Apple AirPlay 2, and UPnP. The D3 is also Roon Ready and can even stream content from a Plex server.

'Fulsome piano chords made for an inviting listen'



RIGHT: Fed from a screened PSU [far right] the D3's mainboard processor lies under a heatsink [centre right] with a Cyclone IV FPGA [bottom] and balanced analogue output board [bottom left] including an ES9028PRO DAC [top left]



Because operation of the unit is entirely app-driven, and Lumin continues to eschew Wi-Fi functionality across its products, a wired network connection is required in order to get everything up and running. If there's nothing in the D3's Ethernet socket when you switch it on, the front-panel display lets you know. Once connected, the streamer then declares itself 'Ready for music'. Little touches like this contribute to the D3's joy of ownership, as does the stable relationship between Lumin's app and its hardware. One niggle? The lip that extends over the D3's rear-side connections, and lack of space, makes disconnecting XLR cables awkward.

INSIDE STORY

Lastly, it's perhaps worth highlighting differences between the D3 and the recently launched Audiolab 9000N, in light of Internet chat about the latter's 'it's a Lumin inside' nature. Lumin's new model is the more affordable of the two by £300-ish and includes dual DACs, the LeedH volume control and more extensive resampling. Audiolab's solution enables streaming

over Wi-Fi, filter selection from its single ES9038PRO DAC, and has a colourful, customisable display. In other words, these are two very different products.

OPEN ARMS

Slick control and usability wouldn't count for much if the D3 delivered a performance unworthy of its price tag, but Lumin's streamer doesn't drop the ball here. With its extensive resampling/transcoding options [see PM's Lab Report, p69] offering scope for 'sound seasoning', particularly of 44.1kHz/48kHz media, and its DAC supporting hi-res DSD files, it throws its arms wide open to – most likely – all your music, and then gets to the heart of it through a clean, revealing performance.

Its transparency can even be a little unnerving at times as the D3 has the habit of exposing the 'flaws' in some tracks that might sound more agreeable on other systems. For example, it was hard to really enjoy Kingdom Come's Led Zeppelin pastiche 'Get It On' from their self-titled 1986 album [Polydor], because where the production aims for cavernous,

ABOVE: Available in black or natural finishes the D3 mirrors the older D2's understated simplicity. Display brightness may be controlled, like all features, via the app [see below]

epic soundstaging the D3's ruthless unearthing of its excessive reverb just made the German group sound as if they were playing an empty arena. Similarly, I've heard 'warmer' renditions of Aerosmith's 'Back In The Saddle' [Rocks; Sony Music 48kHz/24-bit] that gave its rollicking basslines a little more punch.

Most of the time, however, the D3 is a delight to listen to regardless of musical genre. 'Miss You', an eight-minute power ballad by Sunset Strip stalwarts W.A.S.P [Golgotha; Napalm Records], segues from gentle guitar and percussion in its opening verse/chorus to pounding, distorted rock capped by an astonishing Doug Blair guitar solo – the D3 flips easily between the two, sounding rich in detail and focus at the start, weighty and aggressive at the end.

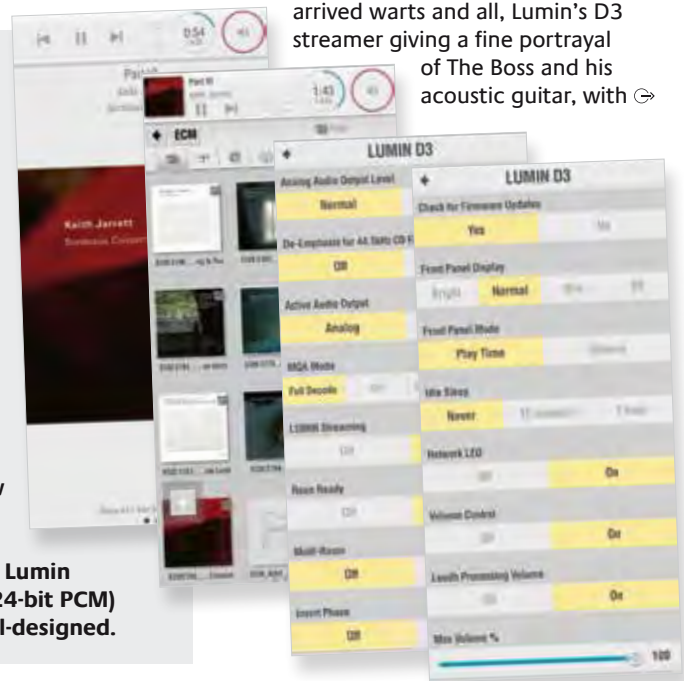
'Nebraska', the title track from Bruce Springsteen's recorded-on-a-four-track 1982 set [Columbia, 192kHz/24-bit],

arrived warts and all, Lumin's D3 streamer giving a fine portrayal of The Boss and his acoustic guitar, with ↻

LUMIN APP

Most D3 owners will play music through Lumin's bespoke app (Apple AirPlay and Roon are alternatives) and the good news is that it's responsive and intuitive – albeit more so on a tablet than a smartphone [screenshots, right]. But this software isn't just about managing playback from integrated services (Tidal, Qobuz, Spotify), Internet radio (TuneIn) and local and networked drives because it also manages hardware settings. Basic adjustments include (but aren't limited to) changing the brightness and 'mode' of your Lumin device's display, switching from fixed to variable output and activating the LeedH volume control, while moving the Resampling option from 'Off' to 'Custom' introduces a long list of up/downsampling settings.

These are all presented with simple yellow/grey menus and text, but music playback is more involving, with album artwork displayed. This aspect is also customisable, adding a drop shadow to artwork if desired, changing the position of text, and more. Meanwhile, browsing your music library is aided by genre, title, artist, year, etc, and tag detection, while Tidal users benefit from Lumin being the first company to support Tidal MAX (hi-res to 192kHz/24-bit PCM) playback. Overall, the Lumin App is impressively in-depth and well-designed.



NETWORK-ATTACHED DAC



ABOVE: Simplicity itself as the diminutive D3 offers two USB-A ports and one wired Ethernet input (384kHz/32-bit; DSD256) alongside an S/PDIF output on BNC (192kHz/24-bit) and balanced/single-ended preamp outputs on XLR/RCA

texture to the strings and a rasp of the harmonica that bordered on strident. Tape hiss on this budget recording robs it of dynamics, but Greg Allman's solo take on his earlier band's 'Midnight Rider' [*Laid Back*; Island, 96kHz/24-bit] sparked against a black background. The bass guitar sounded rich and syrupy, providing a foundation for smooth keyboard licks and Allman's well projected vocal.

There was a similar feel to the Lumin D3's delivery of Billy Joel's 'Piano Man' [*Piano Man*; MFSL, 88.2kHz/24-bit], where the plump bass notes and fulsome piano chords made for an inviting listen, but the clarity of his singing – and the harmonica accompaniment – ensured it sounded open and dynamic, rather than homogenous.

COMING CLEAN

Lumin doesn't make use of the filter options provided by the ES9028PRO DAC, but tweekers can experiment with its in-house resampling/transcoding. Downsampling (from 384kHz to 48kHz, for example) lets the D3 be used as a transport into a legacy outboard DAC. On the flip side, upsampling and format conversion bring the allure of sound quality improvements.

My listening yielded no eureka moment, although on Dire Straits' *Love Over Gold* [EMI], streaming over Tidal/Roon in plain vanilla 44.1kHz/16-bit, the introductory keyboard and thunder effects of 'Telegraph Road' sounded very slightly 'fuller' transcoded to DSD256. As always, mileage extracted from such user adjustment will depend on personal preference and the wider playback system, and credit is due to Lumin for making this element of its platform comprehensive and easily managed.

Moreover, even if you opt for a 'native' performance, the D3 sounds effortlessly clean, with no hash to its

highs or ponder to the low-end. It isn't the last word in sheer openness and 'air', but small treble elements are always easy to discern, bringing pleasing impact to percussion in particular. On 'Industrial Disease' from the Dire Straits album, rim shots and hi-hat strikes cut through the synth background and blues guitar. And this clarity pays dividends in terms of imaging.

The recent *Boston Pops Orchestra: John Williams* [UME] features the film soundtrack composer waving the baton through various career highlights, plus some from others, and the D3's handling of it was largescale and thrilling. His version of Jerry Goldsmith's slow-moving *Aliens* theme was impressive, its undulating strings delivered with spine-tingling atmosphere, on a soundstage with plenty of width and depth.

The march from *Raiders Of The Lost Ark* – led by its familiar brass motif – was even better. It enjoyed genuine heft, but amidst all the drama, the D3 also reminds you of Williams' playful nature, spotlighting the track's delicate glockenspiel and flighty rhythmic feel, so you really appreciate his ability. Lumin's D3 is nothing if not insightful. ☺

HI-FI NEWS VERDICT

Not for Lumin an entry-level model that's the runt of the litter, for the new D3 is closer to the company's step-up T3 DAC/streamer than the £2k price difference suggests. Wide-ranging file compatibility, extensive resampling options and bespoke app control contribute towards this unit's 'bargain' status, and the deal is sealed by its performance. Grab an audition – and take your credit card along...

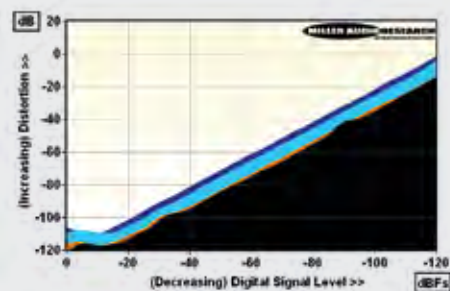
Sound Quality: 88%



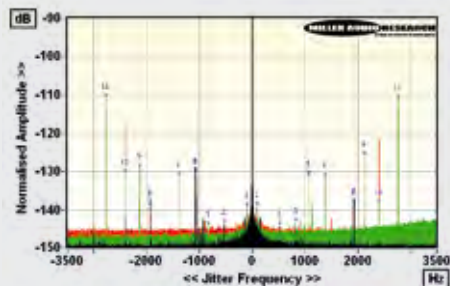
LUMIN D3

Lumin's 'Analogue Audio Resampling' is entirely synchronous, so 48kHz inputs have the option to be upsampled to 96kHz, 192kHz and 384kHz while 88.2kHz streams may be lifted to 176.4kHz and 352.8kHz, for example. The impact on distortion is measurable but negligible – actually slightly *higher* with upsampling – but THD is otherwise as low as I have seen from the ES9028PRO DAC at 0.00005%/1kHz up to 0.00035%/20kHz at the D3's peak 0dBFS/5.03V balanced output [see Graph 1, below]. This is significantly lower than achieved by the WM8741 DACs employed in the Lumin D2 [*HFN* Jul '20] although the very wide 116.5dB A-wtd S/N ratio and low 10ohm source impedance reflect the similarities in the D2/D3's *analogue* output stage(s).

But here's where Lumin's upsampling does have a real impact because the A-wtd S/N improves still further to 118.5dB – clearly visible on the jitter spectrum [see Graph 2] – along with a reduction in correlated sidebands from 65psec to 10psec (48kHz native vs. upsampled to 192kHz). Format conversion to DSD64 results in an increase in jitter to 165psec alongside the expected lift in top-end noise [green spectrum, Graph 2] but this falls back to 37psec when converted from 48kHz to DSD128. Meanwhile, although Lumin's chosen filter for the ES9028PRO DAC – the slow roll-off linear phase option – remains in the loop, the responses are still influenced by upsampling. At higher sample rates the top-end response switches from –6.6dB/45kHz to –9.4dB/45kHz (96kHz media) and –15.4dB/90kHz to –19dB/90kHz (192kHz media) with upsampling off (native) then switched on, respectively. Plenty here for the 'fine-tuners'! PM



ABOVE: THD vs. 48kHz/24-bit digital signal level over a 120dB dynamic range (1kHz, native, black; upsampled, orange; 20kHz, native, cyan; ups., blue)



ABOVE: High resolution 48kHz/24-bit jitter spectrum (native, red; upsampled to 192kHz, black; format converted to DSD64, green, with markers)

HI-FI NEWS SPECIFICATIONS

Maximum output level / Impedance	5.03Vrms / 10ohm (XLR out)
A-wtd S/N ratio (Resampling Off/On)	116.5dB / 118.5dB
Distortion (1kHz, 0dBFS/-30dBFS)	0.00005% / 0.0008%
Distortion & Noise (20kHz, 0dBFS/-30dBFS)	0.00035% / 0.0018%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0 to -1.2dB/-6.6dB/-15dB
Digital jitter (48kHz / 96kHz / 192kHz)	10psec / 9psec / 10psec
Resolution (1kHz @ -100dBFS/-110dBFS)	±0.1dB / ±0.2dB
Power consumption	6W (5W standby)
Dimensions (WHD) / Weight	300x60x244mm / 2.5kg