

NETWORK-ATTACHED DAC

Network-attached streaming DAC
Made by: iFi Audio, China
Supplied by: AMR/iFi Audio (Abbingdon Global Ltd), Southport
Telephone: 01704 543 858
Web: www.ifi-audio.com
Price: £1299

AUDIO
FILE

hi-finews
OUTSTANDING
PRODUCT

iFi Audio NEO Stream

Built into the same chassis as the NEO iDSD, with the same DAC onboard, this new version loses the headphone amp in favour of a bespoke, app-driven streaming platform
Review: **Jamie Biesemans** Lab: **Paul Miller**

To say iFi Audio is an industrious producer of compact hi-fi solutions would be an understatement. More recently the brand has been on a steep upward path of technical evolution, employing designers as accomplished as the marketing department is imaginative. The result? iFi Audio is successful because it has identified new hi-fi hotspots that appeal to both younger and older music lovers alike.

Which brings us to the NEO Stream, the second product in its non-mobile NEO range. Defining what this multifunctional unit does isn't easy – it's probably easier to say what it doesn't. As the name implies, the NEO Stream is a connectivity-rich streaming device featuring both a capable on-board DAC and digital outputs.

BALANCING ACT

Broadly speaking you can use the £1299 NEO Stream as an outboard DAC delivering analogue audio to, say, an amplifier or powered speakers. To do this you can choose between single-ended RCA or balanced 4.4mm Pentaconn connections, the latter fast becoming the dominant high-end head-fi standard [see EarMen's CH-Amp, *HFN* Oct '22]. If you want to use the NEO Stream with balanced hi-fi separates, you'll have to pick up a Pentaconn-to-dual XLR adaptor cable.

Equally, iFi Audio's NEO Stream can function as a digital transport, feeding the digital input of an external DAC or digitally equipped amplifier or active loudspeaker. Its optical, coaxial and AES/EBU outputs allow for legacy set-ups, but outboard DACs with HDMI I²S and USB inputs are also catered for if you're playing digital audio above 192kHz or DSD streams (up to DSD512) – the other digital outs are limited to 192kHz PCM.

RIGHT: PCB topside [left pic] has filtering and regulation for the 1.2MHz switchmode PSU [bottom] feeding the Quad-core ARM Cortex processor [top] and... [right pic] XMOS 16-Core USB/MQA processor [top] and Texas Instruments' DSD1793 DAC [top right]

Packed as the NEO Stream is with outputs [see p75], there's still sufficient real estate for iFi Audio to shoehorn in three physical LAN connections – a conventional RJ45, 'industrial' M12 socket and optical SC port. Even if you have no optical networking at home, iFi Audio includes a galvanically isolated 'OptiBox' Ethernet-to-optical transceiver and 1.5m optical cable in the box. Meanwhile, the built-in Wi-Fi performed very well during my testing too.

A LA MODE

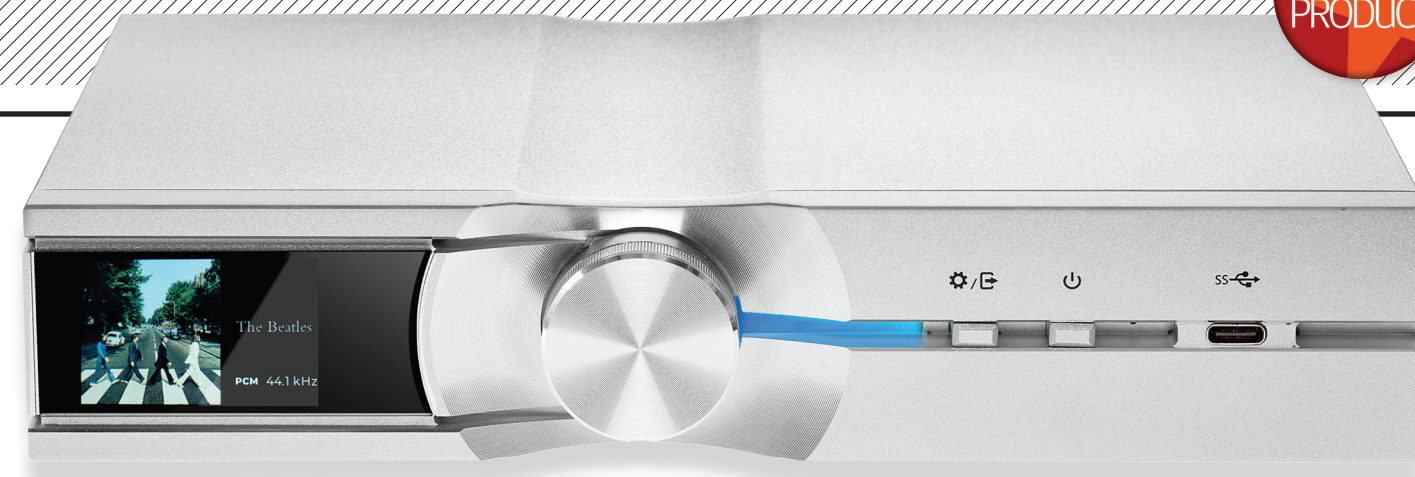
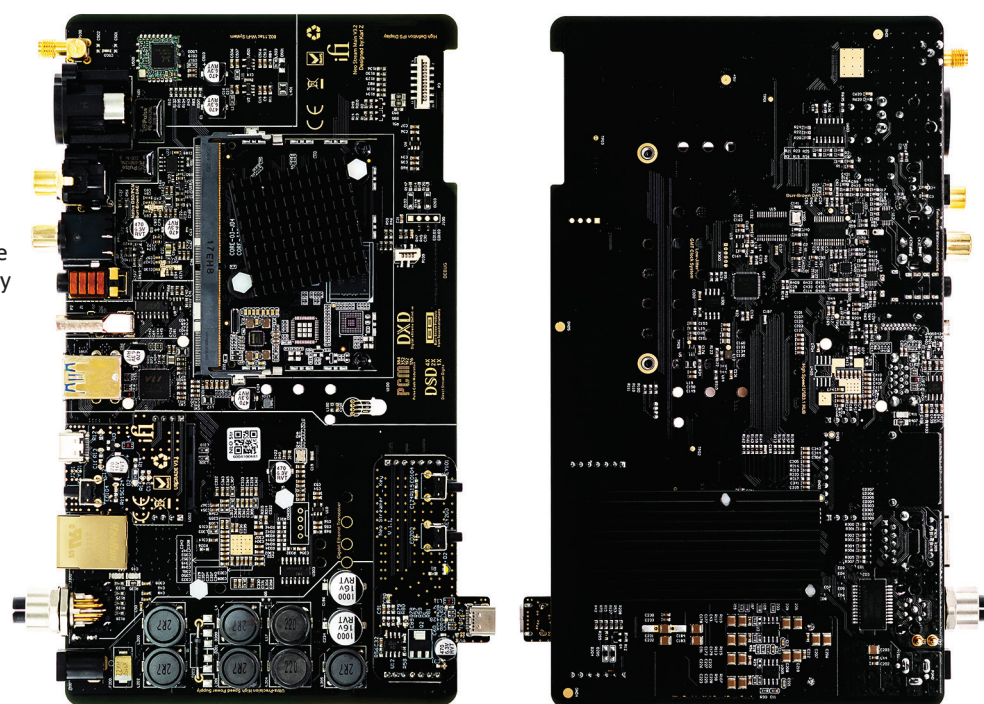
True to the device's concept, digital inputs are absent so you can forget about connecting a TV or CD transport. Streaming is where the music comes from and, like the more affordable digital-out only ZEN Stream, the NEO Stream runs its own software (based on Volumio), with Tidal Connect, Spotify Connect, Apple AirPlay and DLNA on board. It is also Roon Ready and one of the few

devices capable of running as a Network Audio Adapter (NAA) for the upsampling HQPlayer software.

Interesting stuff, especially as you can elect to run the NEO Stream in a general mode (enabling all streaming options) or in one of four exclusive modes (Roon, Tidal, NAA or DLNA only). If you prefer playing your own files locally, just connect your USB storage to the second USB port on the rear where the NEO Stream boasts good format support, including the hi-res variants of AIFF, ALAC, FLAC and WAV.

Otherwise, the industrial design of the NEO Stream is clearly culled from the earlier NEO iDSD [*HFN* Mar '21], featuring a large, centrally positioned dial and a colourful TFT screen off to one side. The recessed multifunctional knob is visually emphasised by a curvy depression in the fascia while a large LED sits to the right. A thin line splits the front panel, hiding a few small buttons

'It's in the details where it shows off its strengths'



and a USB-C port. All this either makes the NEO Stream a bit 'showy' or genuinely original, depending on your take.

Build quality appears excellent and, also true to form, iFi Audio's 'why stop at one function when you can add a few more?' design philosophy is equally evident. Even that red LED is not purely a power indicator; it also signals the quality of your network connection. Brand mainstays including 'Active Noise Cancellation' (ANC II) on the USB port, and an iPower X plug-top PSU, which costs about £100 when bought on its own, are present.

Like its iDSD sibling you can park the NEO Stream in a horizontal orientation or upright with the aid of the supplied stand. The display will rotate correspondingly, ensuring you can always read the metadata of the tracks in play. You might, however, need a pair of binoculars if the unit is sat a few metres away because the device's screen really is quite tiny, reinforcing the feeling that the NEO Stream design is pitched somewhere between a desktop unit and a 'proper' hi-fi separate.

Similarly, certain settings can only be adjusted via the screen and the rotary dial, which is not particularly handy if you're

listening to music while laid out on the sofa. But to be honest, these are minor gripes. The information shown on the NEO Stream's display can be easily viewed on a mobile device [see boxout, below], and the settings which are only accessible via the front panel – the four DAC filters and exclusive modes – are by nature things you'll probably 'set and forget'.

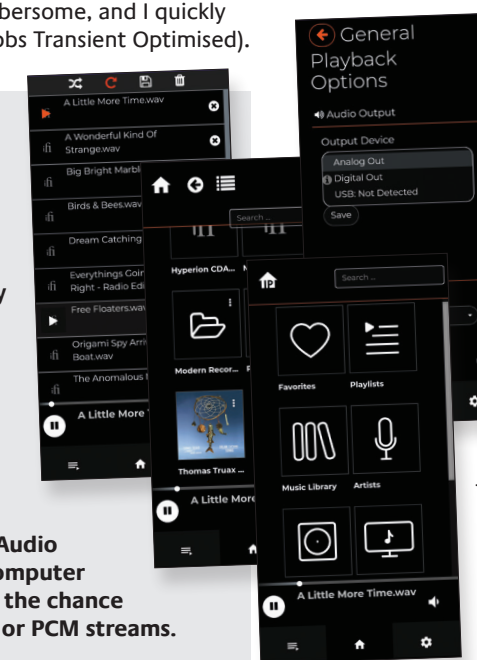
MOVING ON UP

Listening to the NEO Stream as a complete package – digital in/analogue out – it's clear that iFi Audio has engineered a very capable, natural and 'musically complete' product. The technical and subjective performance of the NEO Stream is illustrative of the brand's onward progress, perchance helped along by feedback from specialist reviews... In fact, as a purist outboard DAC, the NEO Stream to my mind performed better than all previous efforts from this brand, and that includes the flagship Pro iDSD Signature [*HFN* Jan '22].

As for switching between the four digital filters [see PM's Lab Report, p75] when using the NEO Stream as a DAC, this was quite cumbersome, and I quickly settled on GTO (Gibbs Transient Optimised).

THE IFI APP

The NEO Stream is best controlled via the iFi Streamer app [smartphone screenshots, right] or web interface which offers exactly the same capabilities. While it won't win any prizes for aesthetic design – and indexing a NAS with 27,500 tracks was tedious – it does present your music library clearly. Working in the background it tries to identify artists and complete the overview with photography and artwork so, if you give it the time, your music collection will end up looking appealing, especially on a larger screen or tablet. Missing in action are integrated streaming services or DAC-related functions, but there's an extensive selection of Internet radio stations and neat extras, such as an alarm, sleep mode and two interface skins. In the end though, it's far more likely the NEO Stream will be used as an endpoint for Roon or another streaming option. The inbuilt Network Audio Adapter (NAA) is compatible with HQPlayer software on a computer (with Roon or standalone), its powerful capabilities offering the chance to stress test your local network with large upsampled DSD or PCM streams.



ABOVE: The display hosts album artwork, audio format, sample rate, input and volume, while the rotary will also help navigate the setup menu. Case can be set vertically into a supplied aluminium stand – the display flips through 90°

Standing up, walking over to the unit and diving into the front panel menu system to change a filter... it's just too much hassle. On the other hand, if I could have changed the filters via the app, I would undoubtedly have played around with this feature more. The same is true with the exclusive modes. Most people would not be interested in comparing, say, Roon in the everyman all-in-one (AIO) mode to the exclusive Roon mode, but a slicker method of switching between them would be appreciated.

OLD DOG, NEW TRICKS

Bearing in mind that the NEO Stream could be an effective solution to upgrading older hi-fi kit, I hooked it up to my venerable and purely analogue Sony TA-A1ES [*HFN* Mar '14] – probably the last real hi-fi stereo amplifier the Japanese brand built. Playing through B&W 703 S3s [see p48], the DAC

made a memorable first impression while streaming the 30th Anniversary Deluxe Edition of the *Palomine* album from indie band Bettie Serveert [Matador OLE1928 44.1kHz/16-bit]. While the vocals of Carol van Dijk capture the attention, it's in the details and pacing of the ensemble where the NEO Stream shows off its strengths. This commemorative re-issue features extra live versions, and it was with a more intimate but still very grungy

NETWORK-ATTACHED DAC



ABOVE: Wireless BT 5.0, wired (RJ45, M12 and optical) Ethernet and USB-A (for HDD) inputs feed coaxial, optical, AES/EBU, I²S (HDMI) and USB-A digital outputs. Analogue outputs are offered on single-ended RCAs and a balanced 4.4mm Pentaconn socket

performance of 'Leg' that I noted the delicate and honest touch iFi Audio's DAC was applying.

Playing the 1970s-inspired soul/funk/jazz of Menahan Street Band's *The Exciting Sounds Of...* album [Daptone Records DAP-063; 88.2kHz/24-bit], via Qobuz through the third-party BubbleUPnP app, further strengthened this impression. There was no bloat or sense of dynamic compression noticeable when the band, perhaps best known for supporting soul singer Charles Bradley, grooved through these atmospheric, purely instrumental tracks.

In its inviting delivery of the slow, melancholic 'Rainy Day Lady', the NEO Stream outshone many competing DACs at this price point. And that was even more the case when portraying the swinging, funky rhythms – and shining a spotlight on backing instruments, such as the obligatory congas – on 'The Starchaser' or 'Cabin Fever'. These pieces could be the soundtrack to a '70s Blaxploitation flick or gritty crime thriller, and iFi Audio's DAC captured the vibe perfectly.

EASY LISTENING

Switching to a more contemporary amplifier in the shape of a Primare I15 [HFN Oct '18], but keeping the 703 S3s in tow and replaying the same Menahan Street Band album, made it even easier to discern which qualities the NEO Stream brought to the table – detail, precision and sparkling musicality. Furthermore, next to the sonic improvement on offer, shifting from one amplifier to another is easily done. Indeed, the NEO Stream caters well to those who like to ‘tune’ their sound by swapping devices in and out of the playback chain. I connected the unit via its USB-A output to a Musical

Fidelity M6x DAC [HFN Jul '22], added in between the NEO Stream and Primare amplifier, and hopping from analogue to digital out was no effort at all. Just pop into the app settings and select the onboard DAC as the main output.

Used in this set-up, the NEO Stream proved to be a very able driver of the M6x DAC. A digital transport might not have the biggest impact on sound quality, but there was no faulting the scale, timing and dynamics with Philippe Herreweghe and the Antwerp Symphony Orchestra performing Schubert's Symphony No. 1, 3 & 4 [PHI LPH 019: 44.1kHz/16-bit ALAC].

While experimenting I also discovered the NEO Stream can actually handle two connected DACs, one via the rear USB-A, one via the USB-C port on the front. It won't stream to both simultaneously, of course, but maybe the rule is: if you can think of a reason why you would want to hook up two DACs at the same time – a comparison listening test, for example – you're smack bang in the target group of iFi Audio's well-featured device. ☺

HI-FI NEWS VERDICT

The NEO Stream is *very* versatile, making it irresistible to restless hi-fi tinkerers chasing the definitive network technology, system integration or streaming option that potentially offers a sound quality advantage. Look past the acronyms and marketing spin, and don't be distracted by minor software or design shortcomings, for this capable package outsmarts more than a few full-sized hi-fi separates.

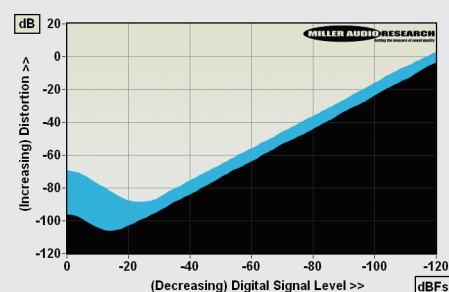
Sound Quality: 88%



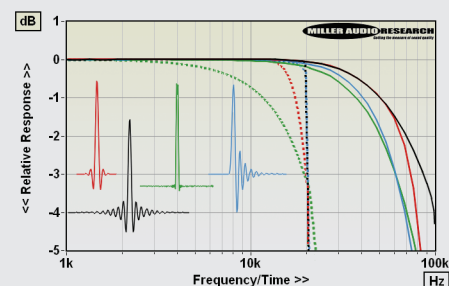
IFI AUDIO NEO STREAM

While the NEO Stream takes its industrial cues from the NEO iDSD [HFN Mar '21], and shares the same XMOS processor and TI DSD1793 DAC, the interim has seen iFi Audio address the only technical foibles detailed in my Lab Report of two years ago. Specifically, peak-level 0dBFS inputs no longer clip the analogue output which now achieves a 'clean' 2.08V (single-ended) from a uniform 37ohm source impedance. Also, the complex jitter pattern with sidebands at $\pm 33\text{Hz}$, $\pm 66\text{Hz}$, $\pm 99\text{Hz}$... amounting to some 550psec [see p55], has now been eliminated. Via its USB-A input, an external HDD and with 32MB buffering, the NEO Stream achieves a fabulously low 5psec and 12psec with 48kHz and 96kHz/24-bit files, increasing to 250psec jitter with 192kHz files, the latter almost entirely PSU-related. The 0.0016-0.035% distortion (20Hz-20kHz) is a little higher at HF than with the NEO iDSD's *balanced* output, but the 0.0005-0.0056% minimum achieved by the NEO Stream at $\sim 20\text{dBFS}$ [see Graph 1, below] is still very good. As, I might add, is the 105dB A-wtd S/N ratio.

If the NEO iDSD was limited to iFi Audio's GTO (Gibbs Transient Optimised) digital filter by default, the NEO Stream offers Standard (linear phase), GTO (minimum phase), Minimum (actually a short linear phase filter!) and 'Bit Perfect' (NOS filter) options via its menu. The Standard and GTO filters deliver the flattest responses (-0.1dB and $-0.45\text{dB}/20\text{kHz}$, respectively) and good stopband rejection (106dB and 53dB) at the expense of added ringing in the time domain [black and blue traces, see Graph 2]. By contrast, the Minimum and BP filters [red and green traces] have little or no ringing but trade this for poorer stopband rejection and a more obviously rolled-off treble with low sample rate files (-3.1dB and $-3.2\text{dB}/20\text{kHz}$). PM



ABOVE: Distortion vs. USB-A 24-bit digital signal level over a 120dB range at 1kHz (black) and 20kHz (blue)



ABOVE: 48kHz (dashed) & 192kHz freq/impulse resps
(GTO, blue; Standard, black; Min, red; B Perfect, green)

HI-FI NEWS SPECIFICATIONS

Maximum output level / Impedance	2.08Vrms / 37ohm
A-wtd S/N ratio	104.7dB
Distortion (1kHz, 0dBfs/−30dBfs)	0.0016% / 0.002%
Distortion & Noise (20kHz, 0dBfs/−30dBfs)	0.035% / 0.0011%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0 to −0.1dB/−1.1dB/−3.6dB
Digital jitter (48kHz / 96kHz / 192kHz)	5psec / 12psec / 250psec
Resolution (re. −100dBfs / −110dBfs)	±0.2dB / ±0.5dB
Power consumption	6W
Dimensions (WHD) / Weight	214x41x146mm / 1kg