iFi Audio Pro iDSD

The most ambitious iFi digital product to date is a hugely flexible DAC/headphone amp with an eye on both studio and consumer markets. But is it just a bit too complex?
Review: **Andrew Everard** Lab: **Paul Miller**

LEFT: Input and volume at either end of the fascia, plus a clear OLED, but the multiple functions of just about every control hint at the flexibility – and complexity – within

The idea of the DAC/headphone amplifier is firmly established, whether for 'on the go' use, desktop audio or as a main system component. Less than £100 will get you started, with the likes of the AudioQuest DragonFly Black [*HFN* Oct '16], Cambridge Audio DacMagic XS V2 or Cyrus SoundKey, while the ambitious might consider models such as the long-running Chord Electronics Hugo [v2, *HFN* Aug '18] and costing the thick part of £2000. However, even by the standards of this highly diversified market sector, the range-topping model from iFi Audio, the Pro iDSD, looks pretty punchy with its £2500 price-tag.

Yes, the Pro iDSD does the basics of taking a signal from your computer and outputting it to a pair of headphones, but that's just the start. There's a list of settings as long as your arm, but only if you're an especially long-armed gibbon, and even then there are add-on options if you want to take the unit further.

SLAVE TO THE RHYTHM

For starters, the Pro iDSD has user-selectable upsampling – all the way to DSD1024 if required – and a choice of valve or solid-state (JFET) output, the option of 6.35mm or 3.5mm headphone outputs or a balanced feed on a 2.5mm socket, adjustable output to suit a wide range of 'phones, and a range of digital filtering options [see PM's boxout, p61].

However, the Pro iDSD is rather more than just a DAC/headphone amp, having both standard RCA outputs and XLRs to make the most of its fully-balanced design, and with a choice of fixed or variable output level to enable it to operate as a source component or a digital preamp, plus the option of boosting the gain on the output stage to suit, for example, use in a studio environment. It's in such

a situation that the ability to slave the unit to an external clock, via a multifunction BNC socket on the rear panel, may also be of most use, synchronising every digital component in a chain to a single reference point. Oh, and it's worth noting that the Pro iDSD has no digital outputs, as these would get in the way of what the unit is all about – digital in, analogue out.

Even that isn't enough for iFi Audio's designers, for as well as being able to operate as a conventional DAC, with asynchronous USB 3.0 Type B (rather than the more commonly seen USB 2.0 Type B), for which a cable is provided, AES3 (XLR), combined optical/coax and BNC inputs, the Pro iDSD is also a fully-functioning media player. It has a USB Type A input for memory devices, a microSD slot and – most important – network capability, either via

Ethernet or Wi-Fi. Combine it with a smartphone or tablet running the Muzo Player app, more usually associated with the DigiFunk Cobblestone wireless music player, and the Pro iDSD will play music stored on your home network – usually on a NAS unit – as well as accessing services including Spotify, Tidal (with MQA decoding built-in) and Internet radio.

STACK OF DACS

If you want to stick to just using the unit as a DAC/preamp, there's also a remote handset, albeit only for volume, while the Pro iDSD draws its power from an offboard supply, and has a loop-through socket to power a second iFi Audio unit.

Using a high-powered XMOS solution for USB and FPGA-based user-selectable upsampling, the digital conversion is based

RIGHT: Packed with tech – including an XMOS USB hub and Xilinx Spartan-6 FPGA [top, centre] feeding two Burr-Brown DSD1793 DACs [below], a motorised volume control [lower right] and J-FET/tube option analogue stage [right]

around a stack of four 'Bit-Perfect' DSD/DXD DACs from Burr-Brown. Incidentally, all incoming data is reclocked and the digital section can handle content at up to DSD1024 and DXD/PCM 768kHz.

The multifarious digital paths are joined by two analogue output stages. Unlike some DACs with a tube option, which just switch the valves into the signal path for a quick warm-up of the sound, the Pro iDSD has separate valve and solid-state stages that can be selected at will. In addition, there's a minimal negative feedback 'Tube+' setting to increase the 'valve effect' [but see PM's Lab Report, p63].

The valves themselves are a pair of General Electric 5670s, and the company says, 'For some recordings and headphones/loudspeakers, Solid-State may sound "more lively". For others, Tube and Tube+ (especially Tube+) will sound more "luxurious". Select the one that sounds best for that particular moment, be it the recording, the mood or even the weather.'

I've never sat in the cockpit of a commercial airliner, but I suspect the pre-flight checks would be only a little

'It grinds out deep basslines while revealing layers of detail'

more complex than getting the Pro iDSD ready for use, so many adjustments and parameter settings does it offer. I'm all for flexibility of operation, provided it doesn't impinge on performance, but it took me several attempts to get the right sound out of the desired socket when first using it, and I was grateful for the two 'white paper' guides iFi Audio has on its website – one for the front panel, the other for the rear.

Mind you, the instructions for network set-up using the Muzo app were non-existent, but I got there in the end by using the Wi-Fi connection for initial set-up, then rebooting the Pro iDSD to get it into wired connection mode.

As is always the case, the selection of digital filters and so on is really a matter of personal taste, so I'm not going to make any 'you must use this' recommendations, beyond saying that I stuck to the maximum upsampling – to DSD1024 – and the BitPerfect+ filter setting. This leaves the signal unmolested save for a little analogue HF tweak courtesy of a filter previously only used in products from iFi stablemate Abbingdon Music Research. Its effect is to put a bit more air

and sparkle in the treble, which can sound just a tad dull in the standard BitPerfect mode. And after some investigation of the two output stages I found the Tube+ routing to be indistinguishable from the Tube setting, which itself added just the slightest sheen of lushness when compared to the solid-state output.

🎵 MANIC MIXES

Checklist done and engines started – an indicator glows green during warm-up, then turns white in solid-state mode or orange for tube – the Pro iDSD proves itself to be a very superior DAC, with massive amounts of detail smoothly integrated with a fluid midband and hefty but fleet-footed bass. Playing The Justified Ancients Of Mu Mu's 1989 *Shag Times* set [KLF Communications JAMS CD3], the Pro iDSD showed how fast and hard-hitting it could be, grinding out the deep, deep basslines while revealing all of the layers and detail in the manic mixes, as was especially clear ⊕
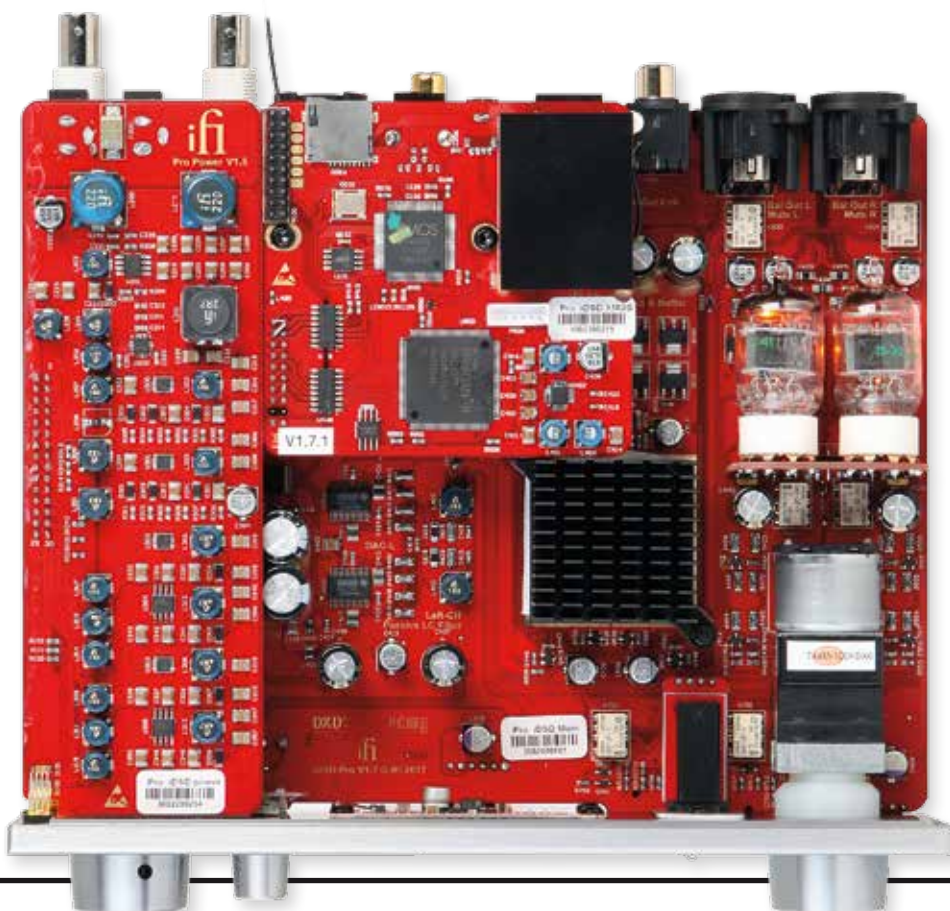
FILTER FLAVOURS

Not only does iFi Audio offer solid-state (J-FET) and GE5670-based tube output options but it also includes five different digital filter 'recipes' as part of its custom upsampling regime. 'Bit Perfect' and 'Bit Perfect+' are essentially no filter at all (NOS), the latter operating up to 96kHz only. Both are free of any pre/post ringing artefacts and thus free of time domain distortions [top inset Graph] but neither do they offer any suppression of digital aliasing products immediately outside of the audioband. These, in turn, may deliver significant intermodulation distortion within the audio range. The standard 'Bit Perfect' setting has a –0.9dB/10kHz to –3dB/20kHz treble roll-off with CD/48kHz media that's addressed by the '+' version courtesy of a +0.25dB treble lift at 10kHz, reducing the 20kHz droop to just –0.5dB. Both are better suited to 96kHz media files. The 'Transient Aligned' filter is a standard linear phase type that offers an adequate 58dB stopband rejection and exceptionally flat ±0.02dB response (20Hz-20kHz), albeit with some ringing. The 'Apodising' and 'Minimum Phase' types are free of pre-ringing, though the former incurs substantive post-ringing [lower inset Graph] while offering superior digital alias rejection. **PM**
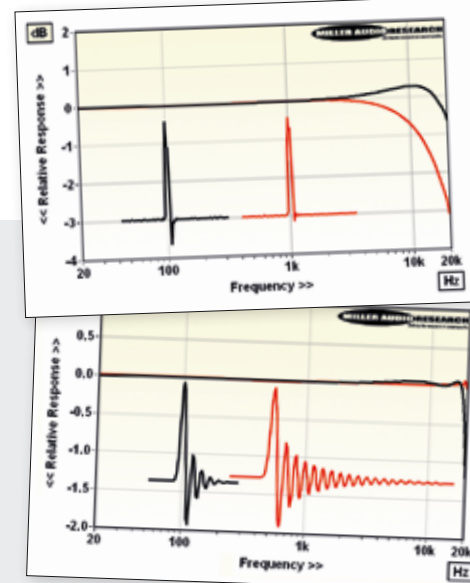
ABOVE: Time and frequency responses of 'Bit Perfect' and 'Bit Perfect+' filters [top, red/black] versus Apodising and Minimum Phase filters [bottom, red/black]

hi-finews
OUTSTANDING
PRODUCT

HEADPHONE AMP/DAC

ABOVE: Digital inputs are shared across a combined coax/optical socket (S/PDIF), BNC-A and B sockets, AES/EBU (on XLR), micro SDHC and wired/wireless Ethernet. A multifunction BNC input also accepts external clock sync'ing. Balanced (XLR) and single-ended (RCA) analogue outs are fixed or variable

comparing the original of 'Whitney Joins The JAMs' with the later, more open and punchier (but Whitney-less) KLF remix on the same album.

That may be a case of throwing the rough at the smooth, though the mixes really do justify the detail a fine DAC like this can deliver, but with the silky DSD256 of the eponymous live album by the Yuko Mabuchi Trio [Yarling Records YAR80161DSD] the Pro iDSD sounds simply radiant, every tiny detail laid bare whether the DAC is used as a source, a preamp or a headphone amp. Indeed, using it with headphones including the B&W P9 Signature [HFN Mar '17], and the Oppo PM-1 [HFN Jul '14] in balanced configuration, the sheer amount of detail on offer, and the way it adds to the music rather than distracting from it, was quite a revelation.

STERN TEST
The recording places Mabuchi centre-stage in the room, ably backed by Del Atkins on bass and Bobby Bretton on drums, and it's hard to think of a set with as much presence as revealed by the Pro iDSD and the Oppo PM-1 headphones. But this is reality, not hi-fi hyper-reality – there's nothing artificial going on here, but rather total communication with the music.

Switch to the valve stage if you want, for late night listening, but stick to the solid-state version for the maximum impact as Mabuchi and her boys swagger through a medley of 'All The Things You Are', 'Take The "A" Train' and 'Satin Doll'. In a word: glorious!

Stick with DSD and the third Dire Straits album, 1980's *Making Movies* [DSD64, from Vertigo UIGY-9520], and the Pro iDSD has you as soon as the band explodes out of the

'Carousel Waltz', that mix of impact, impetus and information revealing previously unheard detail. In fact, so grabbed was I that I immediately moved on to the band's *Love Over Gold* [Vertigo UIGY-9505], also in DSD64, just to hear what iFi Audio's finest could do with the ethereal opening of 'Telegraph Road' and the slam of 'Private Investigations'. I wasn't disappointed.

Finally to a stern test of any system – if you'll pardon the pun – in the form of the Reference Recordings *Britten's Orchestra* album [RR-120], whose performance of *The Young Person's Guide To The Orchestra* by the Kansas City Orchestra under Michael Stern could have been designed as a forensic investigation of what a piece of audio equipment is doing. From the fine detail of the woodwind at the beginning of the great fugue to the way the entire band winds itself up to the crashing, triumphant climax, the Pro iDSD remained fully in control while still allowing the music off the leash. This is quite a magical little box of many tricks. ⏻

HI-FI NEWS VERDICT

In tune with its studio aspirations, this is one of those 'need to know what you're doing' products. There's no fast or easy way to get the most out of it, and some aspects of its set-up need work, but it rewards the effort with a scintillating sound, whether as a source or a preamp into a main system, or with headphones. Get past the complexities, and avoid adding any more, and you'll not be disappointed.

Sound Quality: 87%

Although the Pro iDSD packs a capable headphone amp, the rated 1500mW/64ohm (and 4000mW/16ohm) cannot quite be achieved in practice because of its limited *voltage* output. While the balanced line outputs achieve 8.45V, the maximum single-ended headphone output is 4.2V (the Pro iDSD was tested at its maximum +18dB gain setting, at full volume and with a maximum 0dBFs digital input). Unlike most DAC/headphone amps, the output is not clipped at this full 0dBFs input/maximum analogue output (just 0.14% THD, in fact), but with the moderate ~3ohm source impedance resulting in a further 0.8dB signal loss, the power output is 578mW/25ohm (or 900mW/16ohm).

This finite source impedance will also emphasise any swings in headphone response with low impedance models – otherwise the frequency response is determined by choice of digital filter [see boxout, p61]. Importantly, residual noise is very low and the A-wtd S/N extremely wide at 108dB, so hiss, hum and other noise will still be low with sensitive headphones.

Distortion depends on digital level, loading and choice of solid-state or tube output [Graph 2, below]. Via the line outputs, THD falls to as low as 0.0003% at –30dBFs (20Hz-20kHz) but is closer to 0.11-0.18% at 0dBFs, merely doubling in 'Tube' and 'Tube+' modes (these are almost indistinguishable). Via the headphone out, THD increases from 0.009% to 0.09% at low bass frequencies when loaded (10mW/25ohm) and from 0.006% to 0.025% at 1kHz [black vs. red traces, Graph 1]. Ifi Audio's digital engineering has improved significantly of late [xDSD, *HFN* Jul '18] – and this is true here with jitter extremely well controlled down to <25psec with 48kHz-192kHz/24-bit data. **PM**
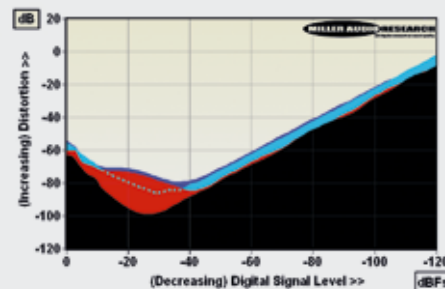
ABOVE: THD vs. digital signal level at 1kHz (black, 600ohm; red, 25ohm; 0dBFs = 578mW and –24dBFs = 1mW) and 20kHz (cyan, 600ohm; blue, 25ohm)
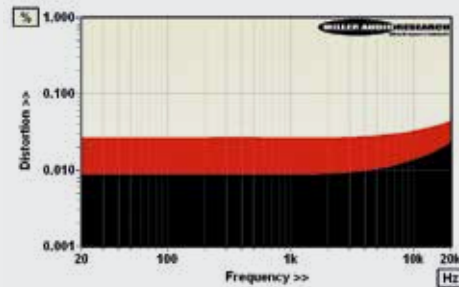
ABOVE: Distortion versus frequency at 2V via XLR line outputs ('Solid-State', black; 'Tube/Tube+', red)

HI-FI NEWS SPECIFICATIONS

Max output/Imp. (<1% THD, DAC)	8.45Vrms / 70ohm
Maximum output (headphone)	4.2V/600ohm / 578mW/25ohm
Headphone Output Imp. (20Hz-20kHz)	2.5-3.4ohm
A-wtd S/N ratio (DAC / headphone)	114.0dB / 107.8dB
Distortion (20Hz-20kHz, DAC/headph.)	0.0086-0.028% / 0.019-0.086%
Freq. resp. (20kHz/45kHz/90kHz, DAC)	+0.0dB to –0.0dB/–0.2dB/–3.4dB
Digital jitter (48kHz / 96kHz, DAC)	20psec / 25psec
Power consumption	11W
Dimensions (WHD) / **Weight**	220x63x213mm / 2kg