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WORLD EXCLUSIVE LINN'S NEW SELEKT DSM IS DIGITAL STREAMING REBORN!

iFi Audio Pro iDSD DAC/ headphone amp/preamp/ streamer

by Chris Martens

Many of you know the backstory behind iFi Audio. In essence, the firm is a spin-off from the well-regarded British high-end audio company Abingdon Music Research (AMR) and iFi's mission is to make AMR-like technology and sound quality accessible to music lovers through several series of compact and affordable components. As you might expect, there are distinct echelons within the iFi range, starting—in ascending order of size, price, and performance—with the Nano range, followed by the newly launched “X” range, then the Micro range, and, at the very top of the pyramid, the Pro-series range. iFi's present Pro-series range comprises three models: the Pro iCAN headphone amp/preamp, the Pro iESL

electrostatic headphone adaptor module, and the recently released Pro iDSD DAC/headphone amp/preamp/streamer, which is the subject of this review.

Stated simply, the Pro iDSD is far and away the most sophisticated and technically advanced DAC that iFi Audio has ever offered and its features set is so forward looking that it would not seem at all out of place in a DAC selling for, say, ten or more times the Pro iDSD's price. Technically speaking, there is so much going on inside the Pro iDSD that it's hard to know where to start with a description, but let me begin with some of the core features of the DAC and then work outward from there.

At the heart of the Pro iDSD is a quad interleaved set of Bit-Perfect DSD and DXD DACs from Burr-Brown for a configuration that, says iFi, “means that up to eight pairs of differential signals can be used and mixed – four pairs of signals per channel”. There are five digital inputs: USB, AES3, S/PDIF (coaxial and optical combo), BNC multifunction (S/PDIF or Sync input), and a WiFi/Network/Mass Storage interface. All inputs are galvanically isolated to minimise noise.

Audio data from all inputs is routed to a memory buffer, where it is de-jittered and then relocked via a femto-grade Global Master Timing clock whose design is drawn from the clock used in the big AMR DP-777 Digital Processor. Decoding processes for all digital audio file formats is handled by ▶



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- ▶ an XMOS X-Core 200 processor, while digital filtering and DSD Remastering (more on this in a moment) functions are implemented through a powerful Crysopeia FPGA device.

By default, PCM files are played in Bit-Perfect (BP) mode, but Bit-Perfect+ (BP+) mode can also be used: neither the BP nor BP+ modes upsample PCM data. However, when users choose one of the Pro iDSD's three other available PCM filter options—including Gibbs Transient Optimised (GTO), Apodising (AP), and Transient Aligned (TA) filters—PCM files are automatically upsampled to 705.6kHz or 768kHz rates (that is, 16x PCM) depending on the sampling rate of the original file. One further option is to take these PCM files, whether bit-perfect or upsampled and filtered, and to run them through the Pro iDSD's sophisticated 'DSD Remastering' engine, which can output either DSD512 or "studio-grade" DSD1024 files.

Incoming DSD files are also played in Bit-Perfect (BP) mode, except when the DSD Remastering option is chosen. In that case, DSD files are directly converted to 16 X PCM files inside the Crysopeia FPGA, then filtered using one of the options available at 16 X PCM, and finally modulated into high-res DSD512 or DSD1024. What's fascinating about this process is that you start out with DSD files, convert them to upsampled PCM format so that you can apply the digital filters of your choice, and then converted back into high-res DSD for playback. Note that incoming DSD files at DSD256 or higher levels are always played in Bit-Perfect mode without remastering. The Pro iDSD can move between PCM and DSD file formats with the greatest of ease.

Thanks to a built-in WiFi antenna, and available Ethernet and host USB input sockets, the Pro iDSD can effectively function as its own server or streamer, which can be controlled by the third-party Muzo App, which is available for most popular Apple and Android smartphones and tablets. The Pro iDSD also offers built-in Spotify and Tidal applications, which again are accessed through the Muzo App. Plainly iFi has packed a tremendous amount of flexibility and numerous connectivity options within the Pro iDSD's deceptively compact half-rack-width chassis.

Because iFi's Pro iCAN headphone amplifier/preamp and Pro iESL electrostatic headphone adaptor module preceded the Pro iDSD in the marketplace, the natural temptation is to think of the Pro iDSD as the DAC that completes the Pro-Series product suite. However, there's really more to the Pro iDSD story than that, because it is also a highly accomplished headphone amp/preamp in its own right.

Much like the Pro iCAN, the Pro iDSD's amplifier section offers three front end configurations: a JFET-based solid-state front end, a General Electric 5670-based valve-powered front end (simply called "Tube" mode in iFi terminology) with low distortion and a moderate amount of negative feedback, plus a relatively low loop-gain/low negative feedback valve-powered front end option (called "Tube +" in iFi speak) that trades slightly higher distortion levels for more pure valve character in the sound. The main amplifier circuit is, says iFi, fully discrete and fully balanced with a "bipolar second stage and MOSFET-buffered bipolar output stage." Levels are controlled by a 6-track, motorised ALPS rotary volume potentiometer. Power output, though lower than that of iFi's potent Pro iCAN headphone amp, is nevertheless a very healthy 1500mW @ 16 Ohms (single-ended) or 4000mW at 16 Ohms (balanced). ▶

“The Pro iDSD invites listeners to make back and forth listening comparisons between file formats.”



Premium quality parts are used throughout the Pro iDSD's audio signal path and power supply sections. For example, the Pro iDSD's analogue section uses audio-grade Elna Silmic capacitors located, says iFi, "within a few millimetres of the audio circuitry supplied." In turn, the digital section features a bank of Elna Dynacaps DZ™ 'Super Capacitors' collectively offering an impressive 6.6 Farads of capacitance. The capacitors are said to have "400 times lower internal impedance than common grades of super capacitors," meaning they, "release energy much faster than other super capacitors." Finally the power supply for the digital section uses six individual TI LDO Regulators with local LC filtering to "provide the final low-noise power for all individual digital sections," including the clock, S/PDIF input, and the DAC's digital section. In short, iFi backs up its high-end performance claims with the sorts of high quality parts one might expect to find in far more costly audio components.

The Pro iDSD's user controls are clearly laid out and straightforward to use, and there is even a small remote control that can adjust volume settings for both the Pro iDSD and the Pro iCAN headphone amp. The only minor word of caution I might put forward is that many of the Pro iDSD's user controls feature multifunction combo rotary/push-to-engage control knobs, so that it pays to keep the user manual close at hand until you become familiar with what each knob does. It's also important to understand that many Pro iDSD control functions are to some degree context sensitive. Once again, the user manual is your new best friend.

During my listening tests I used the Pro iDSD both as a DAC/amp and as a pure DAC operated in conjunction with the iFi Pro iCAN and Pro iESL. I also ran the Pro iDSD with a very wide range of headphones and earphones including the HiFiMAN Susvara and Sundara, Abyss AB-1266 Phi Edition CC, Final D8000, Massdrop by Noble Kaiser 10U, and Campfire Audio Comet and Atlas. At each step along the way the Pro iDSD moved from sonic strength to strength, in the process creating an overwhelmingly positive impression.

First, the Pro iDSD proved quiet enough (at 0dB gain) to use with extremely sensitive earphones, yet powerful enough (at +18dB of gain) to drive even very

demanding headphones such as the HiFiMAN Susvara. Further, the Pro iDSD proved ready, willing, and able to play digital audio files of all formats and of widely varying sampling rates and resolution levels. What is more, the unit proved able to transition from bit-perfect playback for PCM or DSD files on up to very high level upscaling in PCM format or very high level remastering in DSD format—all of this in real-time and with nary a hitch or glitch. In short, the Pro iDSD invites listeners to make back and forth listening comparisons between file formats, resolution levels/sampling rates, and also the digital filter options selected.

The Pro iDSD offers more resolution than any other iFi DAC I have heard to date (and more resolution than most competitors at or anywhere near its price). Still, this does not mean the Pro iDSD has joined the ranks of the "detail über alles" brigade; in keeping with longstanding AMR and iFi practice, this is still very much a component that prioritises holistic musical integrity over "bleeding edge" resolution at all costs. As a result, users enjoy traditional AMR/iFi musicality, but with a heaping helping of low-level musical information on the side.

The effects of high level PCM upsampling and DSD remastering are both audible and beneficial. PCM upsampling tends, for example, to make music sound less granular and more whole and complete, with ▶

“The Pro iDSD is a terrific performer in its own right.”

▶ one upshot being that everything from 44.1 PCM files on up to 352.8 DXD files suddenly start to display both sharpened focus and more continuous, three-dimensional contours. A great example would be Kleiberg's *David and Bathsheba* opera-oratorio [2L, DXD 352] where the result of upsampling and filtering is a superb recording made even better, complete with a striking quality of 'reach-out-and-touch-the-performers' realism.

In turn, DSD remastering—especially at the DSD1024 level—tends to take everything you have ever liked about DSD format material and make it better across the board. With DSD1024 remastering applied, the music sounds effortlessly and naturally detailed, with enhanced (but not exaggerated) qualities of spaciousness and three-dimensionality. To hear these qualities in action try listening to the title track of Return to Forever's *Romantic Warrior* [Sony, DSD64], where with DSD1024 remastering Chick Corea's keyboard sounds at once free-flowing yet incisive, Al DiMeola's guitar riffs exhibit rich textures and blinding speed, Stanley Clarke's bass(es) sound incredibly rich and full throated, and Lenny White's percussion anchors the proceedings with great clarity, punch, and compelling authority. The DSD64 version of the track sounds very fine, but the remastered DSD1024 version helps the music find a whole new gear with richness and energy to match.

The Pro iDSD makes it easy to compare the relative sonic merits of BP and BP+ playback alongside its other three digital filters (GTO, AP, and TA), where sonic differences are plainly audible, yet also quite subtle. Each of the filter settings can be beneficial in certain use cases, but the one setting that offered the most sonic benefits in virtually all cases was the Gibbs Transient Optimised filter. This filter yielded clear and articulate transient sounds, pure and natural timbres, realistic attack and decay characteristics, and natural (never special effects-like) three-dimensionality. In short, the Gibbs Transient Optimised filter combines all the best aspects of the Transient Aligned filter with a markedly more natural and realistic presentation overall. I came to these conclusions purely by listening to the Pro iDSD's various filters over a long period of time, but after the fact I found an iFi tech paper that indicated the firm also has a preference for the Gibbs filter for essentially the same reasons I've outlined here. In my view, the Pro iDSD is a terrific performer in its own right, both as a DAC and as a headphone amplifier. In fact, I think many users will find it to be as much amplifier as they might ever need or want. With that said, however, let me observe that there is something flat-out magical about using the Pro iDSD in concert with Pro iCAN amp. Good though the amp section of the Pro iDSD is, the Pro iCAN dials in a few clicks more precision and control, plus substantially more dynamic muscle and swagger for handling power hungry headphones like the HIFIMAN Susvara. By combining the Pro iDSD with the Pro iCAN, users wind up with an absolutely masterful personal audio playback system that has few peers at this (or really any) price point. +

TECHNICAL SPECIFICATIONS

Type: Hybrid solid-state/valve-powered DAC/headphone amp/preamp/streamer

Valve complement: twop NOS General Electric 5670 valves

Digital inputs: USB, AES3, S/PDIF (coaxial and optical), BNC multifunction (S/PDIF and Sync), combination Ethernet/WiFi/Network/USB Host

Supported formats:

PCM up to 768kHz
DSD up to DSD 1024
DXD and double-speed DXD

Upsampling options: PCM to 705.8kHz or 768kHz

DSD remastering options: DSD 512 and DSD 1024

Digital Filters:

Bit perfect
Bit perfect +
Gibbs Transient Optimised
Apodising
Transient Aligned

Analogue Outputs:

Rear panel: Balance XLR and singled-ended RCA

Front panel: 6.35mm single-ended headphone jack, 3.5mm single-ended headphone jack, 2.5mm balanced headphone jack

Gain: 0dB, +9dB, +18dB

Power output:

Balanced: >4000mW @ 16 Ohms

Single-ended: >= 1500mW @ 16 Ohms

Dimensions (HxWxD):

63.3mm x 220 x 213mm

Weight: 1980g

Price: £2,499 (including VAT); \$2,499 US

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