

IN-DEPTH NAD C 510 DIRECT DIGITAL
DAC/PREAMP £999

Binary finery

When is a DAC not a DAC? When it's a fully functioning digital preamp. **Ed Selley** discards his analogue to listen in



DETAILS

PRODUCT
NAD C 510
Direct Digital

ORIGIN
Canada/China

TYPE
DAC/preamp

WEIGHT
4.7kg

DIMENSIONS
(WxHxD)
435 x 99 x 309mm

FEATURES

- 35-bit upsampling
- 24/192kHz capable
- 2x HDMI inputs
- 100 step volume control
- XLR and RCA analogue outputs

DISTRIBUTOR
Sevenoaks Sound & Vision

TELEPHONE
01732 459555

WEBSITE
nadelectronics.com

As a category, digital-to-analogue converters were on the verge of extinction only a few short years ago.

Compact Disc ruled the roost and issues such as jitter gave technical credence to sticking with just a single box. Now, with CD in decline and a variety of methods of listening to digital taking its place, DACs are a big deal again. Not content with staving off extinction, digital-to-analogue converters now have other product categories in their sights.

The C 510 you see here would be notable enough as a DAC given that it includes some connectivity I've not encountered before, but that is only half the story. It also has full volume control and has its sights set firmly on your preamp.

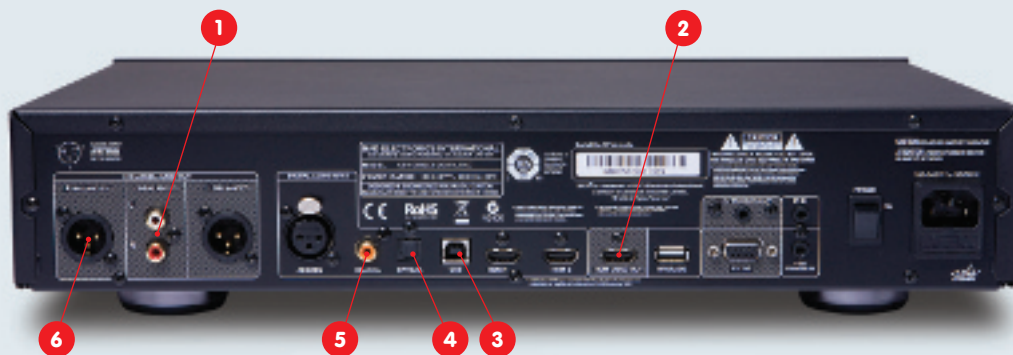
To do this with any degree of transparency, the C 510 has to ensure that the level of the digital signal can be adjusted without affecting the content itself. Adjusting the level of digital by removing bits of it (literally bit reduction) is easy enough, but isn't a solution that will sound much good unless the volume is wide open. To get around this, the C 510 takes all

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signals and upsamples them to 35-bits. This additional information is passed through a CSRA6601 8-channel digital modulator, which sacrifices this additional information to provide level adjustment without the original content of the file – even up to 24-bit/192kHz sample rates – being affected.

The advantage of this (allowing for an equally talented amplifier and infinitely sensitive speakers) is that the C 510 should sound the same at any of its 100 separate volume increments – no 'sweet spot', wonky volume ramping and no recessed performance or channel imbalance at low levels, just the signal as it is supposed to be. This is not the first time a product has used this process. Cambridge Audio and Chord Electronics – to say nothing of NAD itself (see *In Sight*) – have both used a similar volume control in their products, but in credit to NAD the C 510 really does feel like a preamp. Volume adjustment is swift and the large number of increments means you can set the level you actually want and not one you nearly want. ▶

CONNECTIONS



- 1 Unbalanced RCA analogue output
- 2 HDMI video output
- 3 Asynchronous USB port
- 4 Digital optical output
- 5 Digital coaxial output
- 6 Unbalanced XLR outputs

To make full use of this volume control, it has a useful collection of inputs. Most notable of these is a pair of HDMI's. These are capable of receiving a stereo 24/192 signal and decoding it before passing the video to an HDMI output. With Blu-ray audio always threatening to be another means of listening to hi-res, this is an interesting idea, although the omission of DSD support is a bit of a shame. These connections are joined by an asynchronous USB and a trio of conventional digital inputs, one coax, one S/PDIF and one optical. The C 510 then communicates to a matching amp via XLR or RCA connections. These have no switch between them suggesting they run simultaneously, which would allow for a sub to be connected as well as a power amplifier.

Coming up short

This looks like a good spread of connections but there is a lack of strength in depth. The AES input looks great but isn't that much use at this price point, while a single optical and coaxial connection is rather less than some of the competition, and leaves you a little short on 'normal' inputs. There is also no digital output, which again is usually fitted by the competition. The lack of analogue connections is more understandable as NAD makes great play of the 'purity' of the C 510 being unaffected by analogue connections, but it does mean that turntable users will have to get creative to get a deck working.

Visually, the C 510 looks like a NAD and not a new-fangled Master series one, either. I think that the grey has got a shade or two darker over the years, but it is still grey and the C 510 is unlikely to be a product you buy for the looks. This being said, the uncluttered lines and clear, easy to read display are welcome and the C 510 feels well assembled and well thought out to use. As already

mentioned, the volume control feels entirely 'normal' with good weighting and ramp. The feelings of normality are aided by a full function remote which while also not a thing of beauty, is easy to use and fairly well laid out.

Sound quality

Connected to a Cambridge Audio 651W power amp via XLR interconnects and running into Neat Momentum 4i speakers, the NAD makes a swift and compelling case that an entirely digital preamp need not be less characterful than an analogue one. With a laptop

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running Foobar connected via USB, the first and potentially most important part of the NAD's performance is that all of this upsampling and adjustment to fit the volume required at the time is inaudible. Not only does it make no impression on the sonic properties of the C 510, those properties are still within what might be seen as the NAD house sound.

Kicking off with the ripped CD of Gary Jules' *Trading Snakeoil For Wolftickets*, the C 510 has an effortless and almost liquid quality to it. At times, the closest parallel that can be drawn is with a well-designed valve preamp. There is something about the space afforded to voices and instruments that is more reminiscent of tubes than serious digital processing. Vocals in particular are rich, weighty and effortlessly convincing. The accompanying guitar is tangibly real too, with a marvellous sense of decay to notes. This is also

HOW IT COMPARES

As the NAD is unique, direct competition is hard to establish but the Cambridge Audio Stream Magic 6 V2 (HFC 393) is about the closest rival. Like the NAD, it is a digital preamp with an entirely digital volume control. While the NAD is a multi-input DAC, the Cambridge is a UPnP streamer with additional inputs. Both offer excellent performance, but the volume control of the NAD is smoother and much more pleasant to live with than the Cambridge. The Stream Magic retaliates with app control and internet radio, which makes it potentially more flexible. In either instance, both make a convincing case for the all digital preamp.

entirely consistent. Importantly, the C 510 lives up to NAD's promise of linear volume and fixed behaviour at all levels – well, almost. While it could just as easily be another component in the audio chain, the NAD undoubtedly has a point on the volume at which there is a jump in the energy and life to the performance. Happily this is a point easily reached in normal listening.

The spaciousness of the performance allows for the C 510 to show off another attribute to great effect. The detail retrieval is truly exceptional and it is able to find incidental moments in recordings that even very capable and more costly rivals can miss. The clever part of this is that due to the refinement and control, it never comes across as analytical or ruthless. There is plenty of information available all the time, but all the NAD does is present it for your consideration, not ram it down your throat.

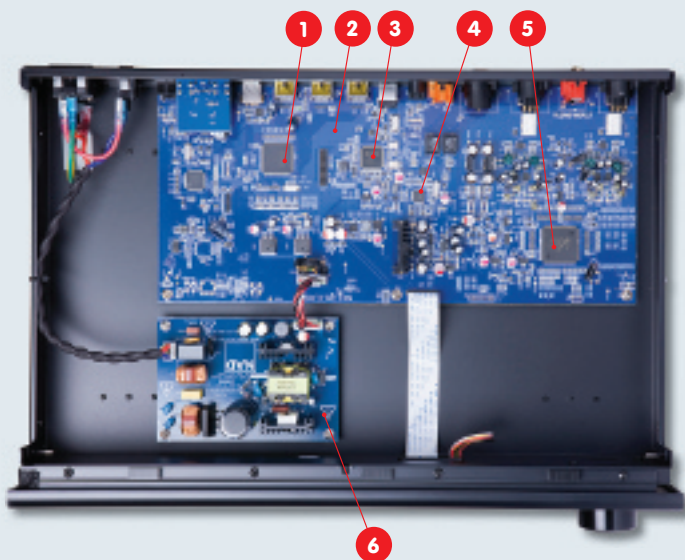
This refinement is not achieved at the expense of drive and impact, though. Switching to Regina Spekter's *Far*, it takes on *Dance Anthem Of The 80s* with speed, deftness and a genuine sense of fun. And 'fun' is a word that crops up in my notes repeatedly during testing.

NAD has achieved its design brief with the C 510 – it genuinely is an excellent preamp that happens to be digital, but none of this sheer ability has come at the expense of ironing the joy out of music. The clarity of the performance assists the sense of timing and agility and the accuracy of the tonality is enough to ensure that the original emotion of the music is maintained throughout.

Moving to high-resolution files, in this case, the 24-bit/96kHz version of Paul Simon's *So Beautiful or So What*, sees the NAD make fine use of the extra information available. The almost analogue quality that good hi-res can possess is shown to good



IN SIGHT



- 1 Analog Devices HDMI chip
- 2 Six layer PCB with large ground plane
- 3 Asynchronous USB input chip
- 4 Low jitter transformer for coaxial digital inputs
- 5 Direct Digital chip – 8 channels in dual differential mode to reduce noise
- 6 Low noise power supply

DEMOCRATISING DIGITAL

The C 510 is a radical product, but it hasn't sprung up out of nowhere. NAD has been experimenting with digital preamps and what it refers to as 'Direct Digital' amplifiers for a number of years and what is notable about the development is that it has been accompanied by falls in price. Its original product was the enormous and rather pricey M2 integrated in the Masters series. This introduced the idea of the all-digital front end to an amp – even the analogue input is converted to digital, but does without the C 510's clever volume control.

This first effort was followed by the 390DD integrated amp, which features a version of the 35-bit volume control

arrangement as well as clever interchangeable modules to decide on the inputs that will work best for you. This step forwards was accompanied by a 50% reduction in the asking price of the M2. With the design premise now a firm part of NAD's product lineup, the first all-digital preamp was the M51, which like the M2 is part of the Masters series. This features an identical spec and connections to the C 510, which makes the latter something of a bargain if you don't mind the slightly more prosaic appearance. NAD has also used the 35-bit preamp technology in the M12, which offers greater input flexibility thanks to the modular board slots on its rear.

effect here. The DAC also seems fairly unconcerned about how these files reach it. Running the same files through the coax via an Arcam airDAC and then through HDMI from a Cambridge Audio 752BD reveals no perceptible differences to the way it goes about decoding them. Given how many Blu-ray players have halfway decent UPnP renderers built into them, the HDMI connections begin to make a great deal of sense. Provided, of course, that you aren't planning to use the audio output from the player anywhere else as that HDMI output is video only.

Conclusion

The C 510 is an unusual product. The intended role is bold and in an industry that tends towards the conservative, I can see it meeting a little resistance from some quarters. The analogue preamp has become an area where systems have fine tuning applied to their performance, and to simply knock it out of your system and entrust the task to your digital front end will take a little getting used to. There are also unanswered questions about what exactly the vinyl fraternity is supposed to do in these circumstances.

The only way that the NAD can go any way towards addressing these concerns is to be extremely good, and this is exactly what it manages to be. In control terms it behaves like a preamp and while I'm not completely convinced the balance of inputs is exactly right, the ones that are fitted work well and offer very consistent performance. And it's the performance that makes this product truly special. The NAD C 510 is a clear indicator that combining your decoding and your volume control isn't simply convenient, it can also be sonically excellent too ●

Hi-Fi Choice

OUR VERDICT

- SOUND QUALITY** ★★★★★ **LIKE:** Exceptional, very consistent performer; inputs; good value
- VALUE FOR MONEY** ★★★★★ **DISLIKE:** Limited coaxial and optical inputs; no DSD; looks
- BUILD QUALITY** ★★★★★ **WESAY:** Accomplished product that simplifies a digital system and boosts performance at the same time
- FEATURES** ★★★★★

OVERALL



Q&A

Greg Stidsen
Director, NAD Electronics



ES: *HDMI is still a fairly unusual fitment on stereo products, is its presence here covering the bases or a belief it has more to offer as a stereo connection?*

GS: HDMI has very wide bandwidth and transmits PCM's native I2S format. The fact that it is an encrypted link – we believe – gives it universality for any copyrighted material that might come along. All the digital formats the C 510 supports are properly engineered and should give good results with audio signals. With HDMI there is the added benefit of stripping the audio and passing through the video of Blu-ray discs for a compelling two-channel experience, particularly with live music discs.

At the moment, the C 510 can interact with most source equipment in the NAD range, bar the phono stages. Is an analogue-to-digital phono stage under consideration?

We do make a digital phono stage module that is part of our more expensive Modular Design Construction models (C 390 and M12), but the C 510 unfortunately does not include the MDC feature. We think vinyl aficionados will typically look to a more traditional analogue preamp.

Does NAD feel that the analogue preamp has much of a future outside of dedicated analogue applications or is it the shape of things to come?

By performing all preamp functions in the digital domain we can offer superb dynamic range and audio precision that would be very expensive to achieve using analogue circuits. Further, with the growing popularity of high-resolution audio, we feel that inserting the multiple analogue stages of a traditional preamp only adds noise and distortion that can obscure the musical detail available with the best 24-bit Masters. We think the architecture of the C 510 is the shape of things to come.

