

## ● REVIEW PRODUCT OF THE MONTH

# Naim DAC-V1 & NAP 100

Just add speakers and a computer for the ultimate desktop audio system

### SPECIFICATION

NAIM DAC-V1 & NAP 100

#### Naim DAC-V1

**Type** DAC/preamplifier

**Price** £1250

**Inputs** Asynchronous USB (up to 24-bit/384kHz), three electrical and two optical digital (up to 24-bit/192kHz)

**Outputs** Stereo analogue on RCA phonos or DIN, fixed or variable level, headphones

**Accessories supplied** Remote handset

**Dimensions** (WxHxD) 20.7x8.7x31.4cm

#### Naim NAP 100

**Type** Stereo power amplifier

**Price** £650

**Power output** 50W per channel into 8 ohms, 75Wpc into 4 ohms

**Inputs** Stereo analogue on RCA phonos or DIN

**Outputs** One pair of speakers on 4mm sockets

**Dimensions** (WxHxD) 20.7x8.7x31.4cm

**naimaudio.com**



While some listeners will enjoy the convenience of a streaming system, using music stored remotely and accessed using a dedicated player connected to the hi-fi system, it's not the only way to combine computer-stored music and an audio system. For many users, using the computer as the player and connecting that to the hi-fi will be a more convenient solution, especially if most of their listening is done while sitting at a desk.

These days that couldn't be much simpler: you can connect the computer directly to a hi-fi amplifier using its headphone output – easy but prone to interference – or take a digital feed from a PC to an offboard digital-to-analogue converter. Some computers have a digital audio output for just this purpose, perhaps in the form of an optical out hidden within the headphone socket, but just about every computer has at least one USB connection, capable of delivering high-quality audio to a suitable external converter. Not surprisingly, a whole industry has grown up to serve that need: there's no shortage of digital-to-analogue converters designed for just this purpose, from tiny computer-powered devices right up to some very high-end DACs with a USB input.

This month we have an example of the latter, but without the stratospheric price tag, in the shape of Naim's DAC-V1 and its partnering power amplifier, the NAP 100.

Housed in Naim's half-width casework, the compact £1250 DAC-V1 is described by Naim as a 'multiple-input asynchronous USB DAC' – but it's also both a preamplifier and a headphone amplifier.

That asynchronous USB input – meaning in simple terms that the DAC's master clock 'drives' the attached computer's USB output to receive bit-perfect data at up to 24-bit/384kHz – is joined by three electrical digital inputs and two optical, able to handle content at up to 24-bit/192kHz, and the company's usual choice of output on stereo phonos or a single locking DIN socket. There's also a full-size 6.3mm stereo headphone socket on the front panel.

The level of the analogue outputs can be controlled by the volume knob on the front, enabling the Naim to work as a preamplifier: though digitally controlled, the volume adjustment is carried out in the analogue domain. Or the output level can be fixed, to allow the DAC-V1 to work as a digital-to-analogue converter into a standard amplifier.

If taking the former route, the obvious companion is the NAP 100 power amp launched alongside the DAC: selling for £650, it delivers 50W per channel from what the company describes as a 'classic Naim discrete transistor power amplifier'. It uses audiophile-grade selected components and a linear power supply with a large toroidal transformer, and is just as compact as the DAC. The

DAC-V1 itself uses Naim's custom-designed 16x oversampling digital filtering, as found in the company's original DAC, selling for £2210. This is implemented in digital signal processing on a SHARC ADSP21489 processor which also controls Naim's proprietary 'zero S/PDIF jitter' system: this takes the incoming data, buffers it, and then relocks it out at a rate suitable for the DAC and digital filter.

The result is that the filtering and Burr Brown PCM1791A DAC, shared with the

*'With or without the NAP 100, the Naim DAC-V1 is clearly a potent little package but – for all its capability – it's simple to set up and use'*

company's NDX network music player and SuperUniti integrated amplifier, are completely isolated from incoming jitter, whether the source is an S/PDIF input or the USB connection.

In addition, to isolate interference from the attached computer, the DAC-V1 makes no use of the 5V power line on the USB connection, the USB ground is filtered, and the digital and analogue sections are galvanically isolated, using optical couplings, to isolate noise. The S/PDIF inputs are transformer coupled to the same effect.

## SUGGESTED PARTNERS

The DAC-V1 and NAP 100 are capable of stunning results, even in a desktop system. Make the most of them with...

### CHORD USB SILVER PLUS

A decent USB cable is worth considering, especially if you're planning a long run from computer to DAC. For this test I used Chord's USB Silver Plus, which starts from around £40



### NEAT IOTA

These speakers are no strangers to regular readers: selling for £695/pr and available in a range of colours, they're the perfect monitors for close-up and small-room listening



## PERFORMANCE

Whether used into an integrated amplifier or with the NAP100, the DAC-V1 is clearly a potent little package but – for all its capability – it's simple to set up and use. Drivers will be needed for Windows computers with which it's used, but it was 'discovered' as soon as I connected it up to my MacBook Air laptop running the latest version of Apple's OS X.

Naim provides a range of configuration guides for the various software packages with which the DAC-V1 is likely to be used: if you're going to go much beyond CD quality – and if you want to play FLAC files – you'll have to look beyond the ubiquitous iTunes. The company even provides a test routine using downloadable files to make sure you really are getting 'bit-perfect' – ie completely accurate – data from computer to DAC.

I ran the system with the inexpensive Bitperfect iTunes extension from the Apple store, and (as one who avoids iTunes whenever possible) with the rather more expensive Audirvana and Amarra software players, both of which are available as free limited-time trial downloads. For testing with the NAP 100 amplifier I set up a complete desktop system, using the trusty Neat Iota speakers; as a headphone amplifier it was used with B&W P3s; and as a standalone DAC it fed my usual Naim SuperNAIT/HiCap/PMC OB1 combination. A USB SilverPlus cable from The Chord Company connected laptop to DAC.

I used files from CD-quality FLACs and WAVs right up to some DXD mastertape-quality files kindly supplied by 2L's Morten Lyndberg, and was consistently astonished at what the little Naim DAC could do. Partnered with the MacBook Air running Amarra, it gave a superbly lively account of Britten's *The Young Person's Guide to the Orchestra*, performed by the Kansas City Symphony in remarkable Reference Recordings 24-bit/88.2kHz resolution: the snap, slap and thunder of the percussion was remarkable, while the way the system allowed the strands of the final fugue to be followed was quite delightful.

And if that was so with the NAP 100 driving the Neat Iota loudspeakers, then the capabilities of the DAC-V1 were even more striking with the SuperNAIT and PMCs in harness, delivering the kind of sheer bass power and musical flow usually only

experienced with high-end network players such as the Naim NDS or the Linn Akurate DSM reviewed last month.

Switch to recordings beyond the capabilities even of those players, with some 2L DXD FLAC content at 24-bit/352.8kHz, and the drums opening Berlioz's *Grande symphonie funèbre et triomphale* certainly grab the attention, as does the percussion throughout the piece, making full use of the resolution and dynamic range on offer. Similarly a recording with which I am very familiar, 2L's 'Souvenir' set, is even more striking in its presence in DXD form, while solo piano from the same label's 'Hommage à Grieg' set is breathtaking in its sense of the instrument in the room at this super-high resolution. It sounds lovely up close through the Naim power amplifier and Neat Iotas, and simply sensational when the DAC-V1 is connected through the 'big system'. Even standard-resolution music sounds remarkable through the DAC-V1, and as a headphone amplifier it has real appeal, too, giving the sound a sense of airiness and lack of effort that makes listening all the more relaxing and rewarding.

This new pairing is an excellent addition to the Naim stable, whether you choose to use the two boxes to create a desktop system or just pick the DAC-V1 as an interface between computer and system. It won't quite drag me away from the convenience of streaming (though the way it handles DXD FLAC files is tempting), simply because when I listen I prefer not to have a laptop open in front of me. However, for those wanting to take this simple route to computer audio, the Naim DAC-V1 is an absolute 'must-listen'. 



## DESIGN NOTES

### Dave Barber

Senior design engineer, Naim

**On the thinking behind the DAC-V1, and how to stop pianos getting clanky**



Dave Barber says Naim's thinking on the DAC-V1 was simple: 'We wanted to create a product that allows the user to get great performance from their computer audio coupled with ease of use. The DAC-V1 and NAP 100 is a great desktop solution.'

He points out that the DAC-V1 is the first Naim product to provide an asynchronous USB input, and that 'the high-speed USB transceiver is not an off-the-shelf solution: the design has been customised for Naim, allowing support for up to 24-bit/384kHz sample-rate audio files.'

A lot of work went into isolating the DAC from power-supply noise, and especially the 5V supply that's part of the USB specification. 'Some other DACs on the market either rely on the 5V USB power supply from the computer to power some of their circuitry, or rely on this 5V to detect when the USB cable is inserted. In either case, noise on that power supply is able to enter the product. In the DAC-V1 there is no reliance on the 5V from the USB and its entry into the product ends at the connector. This eliminates power-supply noise from the PC.'

When it comes to music, he says, 'at the moment I'm liking my folk-rock/country/folk-inflected indie pop – bands like Lumineers, Passenger, Mumford and Sons, Noah and the Whale – but on my darker side I fancy some electronic hip-hop rhythms and dub grooves, such as Massive Attack, Air and Faithless.'

But he says nothing quite reveals what a DAC is doing more than some piano, and for this he turns to Rachmaninov's piano concertos: 'They're so good at revealing inadequacies in DACs and how piano sounds so different with different resolutions.'

'If you start with a good recording at 24-bit/192kHz and then start to move down in resolution, you just find the piano starts to sound increasingly clanky.'

**'Rachmaninov's piano concertos are so good at revealing inadequacies in DACs'**