

# North Star Design Essensio (£825)

With its high-speed asynchronous USB input designed to get the best possible sound from computer audio sources, the Essensio is very much a DAC for the modern age

Review: **John Bamford** Lab: **Paul Miller**

**A**mong cost-conscious hi-fi enthusiasts, Italy's North Star Design company has a reputation for making cutting-edge digital audio products that sport sensible price tags. Its latest Essensio DAC is a new entry model in its portfolio that appears to tick all the right boxes for those looking to explore the world of high resolution digital downloads from audiophile labels without needing to take out a second mortgage.

It undercuts the price of its existing £1420 USB dac32 by dispensing with balanced outputs and AES/EBU (XLR) digital input sockets. Also missing is the RJ45 socket for I2S interfacing with North Star's £1750 Model 192 MkII CD transport. And like all the company's DACs it is simply *stereo*. So if your aspirations include full-on multi-channel replay of modern hi-res downloads (not that there are currently many to choose from, most purchasable downloadable files from the audiophile labels being limited to stereo) you'll have to dig rather deeper into your pocket for a Firewire-equipped multi-channel DAC of professional studio calibre – from the likes of Prism Audio, for example.

Close inspection shows that the Essensio's casework is in fact fairly utilitarian – and the lid might usefully do with some anti-resonance damping. However, its substantial brushed aluminium fascia is immaculate and the four feet with rubberised centre portions are clearly more than just an afterthought.

Only one set of single-ended (RCA) outputs is provided for hooking up to an amplifier's line input. But with no fewer than five S/PDIF inputs – three optical (Toslink) and two electrical (RCA) – plus an asynchronous USB input for computer audio sources, the Essensio can work as a D-to-A converter for your CD transport, satellite or Freeview TV receiver box and what-have-you, with inputs to spare. The

only pity is that input switching is manual via the front panel's selector buttons: no remote control is provided.

## UNDER THE LID

The high resolution audio capability of DVD-Audio may have failed to catch on a decade ago, but modern digital studio master recordings – which far surpass the fidelity and resolution limitations of CDs – live on in the form of hi-res file downloads that can be burned to recordable DVD media (if you so wish) or played out from computer HDDs. To cover the numbers, then, the Essensio's optical inputs will accept data up to 24-bit/96kHz, the coaxial inputs up to 24/192kHz, and the USB input up to a notional 32-bit/192kHz.

Under the bonnet the Essensio up-samples and re-clocks *all* incoming data to 32-bit/192kHz for internal processing, as North Star Design's MD and chief designer Giuseppe Rampino has been a firm advocate of up-sampling for many years now [see boxout, p61].

Separate power supplies are used for the Essensio's digital and analogue

sections, the DACs being 32-bit/192kHz-capable Burr-Brown PCM1795 devices.

It's the implementation of the Essensio's USB input that is all-important for accurate playback of high resolution digital audio from computer sources. As discussed before in these pages, a PC is constantly busy attending to myriad operating system housekeeping chores, and is hardly optimised for the uninterrupted streaming of audiophile-quality music. The all-important USB input in the Essensio is a high-speed asynchronous type that governs the flow of data from a computer's USB terminal to minimise jitter in the incoming stream. Signals from the USB input are magnetically coupled using an Analog Devices ADuM1400 digital coupler which North Star claims will avoid interference between the USB and DAC grounds.

For listening to digital files from my laptop's HDD I used the Lindy USB cable that comes in the Essensio's packing carton. Unlike some USB-equipped DACs the Essensio is not *quite* plug 'n' play, inasmuch as proprietary interface drivers, supplied on a CD, must first be installed.



**RIGHT:** A Crystal CS8416 receiver handles S/PDIF digital inputs followed by a CS8421 upsampler from the same stable. North Star uses a '32-bit' DAC chip, the PCM1795, from TI



But this takes only a couple of minutes and the instructions provided will take you through it without any difficulty.

The Essensio instruction manual contains some succinct (and, for novices, invaluable) recommendations on PC and Macintosh playback system setup. For Windows platforms it recommends Foobar2000 and usefully includes instructions for downloading kernel streaming support from the 'components' section of Foobar's website and how to implement it. Follow these instructions to the 't' and you'll enjoy playback of audio files with automatic switching between 44.1, 48, 88.2, 96, 176.4 and 192kHz sample-rates that works seamlessly.

### FREE-FLOWING SOUND

Using the Essensio initially as an outboard DAC for my resident, somewhat ageing, Pioneer DV-868AVi universal disc player – retained in my system for playback of my collection of hi-res DVD-Audio discs and SACDs – gave clear evidence of its capabilities. The Pioneer 'old faithful' is not a bad CD player, in fact, especially when playing 'clean' recordings, it sounds vibrant and open-mouthed with good subjective bandwidth and resolution of detail. But it can be a little cold and matter-of-fact, and ruthlessly unforgiving of harsh, brittle recordings. Using the DV-868AVi simply as a disc transport into one of the Essensio's coaxial S/PDIF inputs resulted in a richer, 'thicker' and more organic sound from all manner of CDs.

There's a free-flowing nature about the sound of the Essensio that draws you in to

the music, allowing observation of subtle detail but without the sound appearing hyper-detailed or edgy. For example, the ethereal wash of keyboards in the background of Jeff Buckley's 'Lilac Wine' from his *Grace* album [Sony 4759285] seemed more delicate, and consequently highly emotive, where before it had barely registered in the production. And the dramatic energy of my favourite track 'So Real' from this album was spectacular. Percussive sounds had more texture and were slightly more open too, the sense of wooden sticks striking cymbals and the rattle of the drum kit's snare appearing more natural and, well, believable. Buckley's vocals appeared to gain in body and harmonic detail, the recording studio's electronic treatment of his crying vocal wails clearly exposed yet not detracting from the enjoyment of the musical drama. The recording's powerful bass guitar and thudding kick-drum gained an urgent, forceful quality with added punch, detail and harmonic decay.

Even during raucous passages in rock recordings the Essensio created an impression of clean, low-distortion sound with tremendous detail and insight, while avoiding the squeaky-clean, hyper-detailed sound that can often make digital replay appear unnatural and hard on the ear. It sounded smooth, harmonically rich, very far from edgy, and rarely harsh except in extreme cases when playing 'squashed' CDs that don't really deserve

*'A soundstage  
you feel you  
could walk into?  
Then this is it'*

**ABOVE:** Up/down selector buttons allow scrolling through the six digital inputs; two rows of blue LEDs show which input is active and the sampling frequency of source data

to be played through any sort of high fidelity system in the first place. Dire Straits' 'Private Investigations' from *Love Over Gold* [Mercury 8000882, 1996 remaster] can sound truly spectacular on a wide bandwidth system, despite being a studio-derived synthetic creation, as can Fleetwood Mac's 'The Chain' from *Rumours* [Warner 256 344], such was the care taken by their respective recording and

mastering engineers – which is why so many of us listened to them *ad nauseam* all those years ago. I still use them as reference markers today! Sure enough, when Mark Knopfler thrashes his electric guitar

vigorously in unison with the majestic, crashing assault on the piano during the coda in 'Private Investigations', this North Star DAC held everything together, avoiding strain and subjective compression – where so often the sound can become strident and brittle when listening at high-ish levels. Don't let me give the impression that the Essensio sounds syrupy-smooth or euphonic, though. No, the sound is sharp-focused and vibrant, with energy and bite. It's the DAC's sense of correctness and crystal-clear highs that keeps the sound open and fresh, removing glare and appearing smooth and relaxed.

## STAR IN ASCENDANCY

Set up in the late 1990s and run by managing director and designer Giuseppe Rampino, North Star Design is based in San Giuliano Terme, just a few miles from Pisa. The company's first product was a 24-bit/96kHz-capable DAC called the Model 3 which was soon followed by an accompanying up-sampler (dubbed Model 4). Says Giuseppe: 'When a CD-standard 16-bit/44.1kHz digital stream is interpolated and up-sampled to (say) 192kHz this adds nothing whatsoever to the original music information, of course. But there are significant advantages in keeping both digital and analogue filters centred far from the upper limit of the audio band, so that the analogue signal coming from the DAC remains more faithful to the original music signal in the time domain, as you avoid the introduction of phase errors in the audible spectrum.'

## FIVE RED LIGHTS

To hear the true power, extension and correct tonal character of the familiar Formula One racing theme – that famous bass riff that starts the closing refrain of Fleetwood Mac's 'The Chain' – you really need Warner's 24-bit/96kHz re-mastering of the mid-1970s multi-track studio master tapes for its 2001 DVD-Audio release – copies of which now change hands for upwards of £100! It's one of hi-fi's disappointments that outboard DACs like this can't be used to enhance the performance of hi-res disc spinners, ➤

## OUTBOARD DAC

## LAB REPORT

### NORTH STAR DESIGN ESSENSIO (£825)

This is the first product *Hi-Fi News* has tested from Italian brand North Star Design, and its debut is impressive. The core performance of the Essensio is determined by its choice of CS8421 asynchronous 32-bit/192kHz upsampler and PCM1795 '32-bit/192kHz' DAC from Cirrus Logic and Burr-Brown, respectively. Performance via S/PDIF and USB is very similar indeed except for the A-wtd S/N ratio. Here the USB figure of 96dB is on a par with *isochronous* DACs (despite its galvanic isolation and asynchronous driver software), the 109dB achieved by the S/PDIF input only reached by the asynchronous USB interface employed by the likes of dCS and Arcam.

Jitter is impressively low at ~40psec (24-bit/48kHz data) and ~30psec (24-bit/96kHz data) via S/PDIF, the sidebands buried beneath the slightly higher noise floor incurred with USB inputs [see red trace, Graph 2 below]. The 1.95V output level and 73ohm impedance is consistent from all inputs as is distortion over the top 20dB of its dynamic range – a fairly uniform figure of 0.003% being achieved from 20Hz-20kHz. At lower signal levels there's a slight divergence between S/PDIF and USB inputs [solid and dashed traces, Graph 1 below] due more to THD+Noise than any real difference in distortion harmonics. The frequency response of all digital inputs is flat to within -0.2dB/20kHz with 44.1kHz/48kHz sources and -0.85dB/45kHz with 96kHz sources, the S/PDIF input even reaching up to -3.6dB/90kHz with very high resolution 24-bit/192kHz digital files. Readers are invited to view full QC Suite reports (S/PDIF and USB) for the Essensio DAC by navigating to [www.hifinews.com](http://www.hifinews.com) and clicking on the red 'download' button. PM



**ABOVE:** Power switch at the rear is in addition to a front standby button. When a 'live' connection to the USB input is detected, it overrides the five S/PDIF inputs

the high-resolution content of DVD-As (and SACDs) being locked inside players and their S/PDIF digital outputs downsampled. Nevertheless, even listening to the considerably leaner and more compressed sounding CD version of 'The Chain' showed that the Essensio digs mighty deep, adding weight and texture to the bass in particular while sounding crisp and highly polished – thus keeping the splash and sizzle of Mick Fleetwood's cymbals in check.

As a test of bass extension there's no recording in my music collection to equal Dave Wilson's 1976 recording of organist James Welch playing the huge Murray Harris organ (70 ranks totalling 3,355 pipes) in Stanford University's memorial church. Track 11 on the CD issue of *Discovery And Music For Christmas* [Wilson Audio WCD-806/8419], 'The Night Of The Star', inspired by the traditional Sussex Carol, sounded nothing short of thrilling, the Essensio successfully recreating the scale of the recording space and the enormous waves of air pressure that can be felt from the lowest fundamentals.

The three-dimensional soundscape, when it exists in a recording, is preserved beautifully by the Essensio. If ever you wanted a soundstage you felt you could walk into, this is it.

### LEVELS OF TRANSPARENCY

Where the Essensio *really* shows its true colours is when you move up a gear to audition high-resolution digital files via the USB input. High Resolution Technology's inexpensive Music Streamer range of USB-powered DACs will give you a pretty good taste of what's possible from hi-res downloads, if you're dipping your toes tentatively into the 21st century world of computer audio replay, starting at less than £200 for

its excellent little Music Streamer II USB DAC. But this Essensio sounds wa-a-ay more delicate and refined, with a level of transparency that is likely to be limited only by the resolution of the amplification chain and loudspeakers in your room.

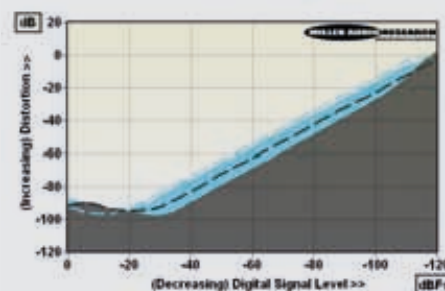
A selection of modern, pristine-sounding DXD recordings downloaded from Norway's audiophile 2L record label [Lindberg Lyd, [www.2l.no](http://www.2l.no)] sounded as good as I have ever experienced in my home system when pushed simply from my laptop through this Essensio DAC. Moreover I have never heard such clear differentiation between 24-bit/96kHz and 24-bit/192kHz files as when I compared a recording of the *Allegro* from Mozart's Violin Concerto in D, K218, with Marianne Thorsen and Norway's Trondheim Soloists – it's also available in multi-channel on SACD [2L-038-SACD].

The 96kHz version of the stereo file sounds more than splendid with a holographic image and realistic bite and resonance to the strings and woodwind, yet the 192kHz version adds further texture and sweetness to the tonality, and seemingly more air to the sound image. In a word: glorious. ☺

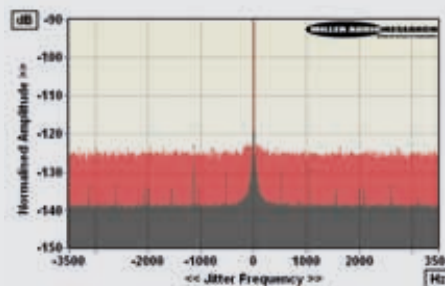
### HI-FI NEWS VERDICT

At a shade under a £1000, North Star Design's Essensio DAC can hardly be considered a casual purchase, but it does deliver high-end sound. With good recordings the sound is polished and refined, along with deeply felt, full-bodied, and taut bass. Even the most committed analogue diehard couldn't fail to be thrilled by the sound of high-resolution files from a computer-based source decoded by the Essensio.

Sound Quality: 85%



**ABOVE:** Distortion versus digital signal level over a 120dB dynamic range using 24-bit data at 1kHz (black) and 20kHz (blue); dashed trace is USB



**ABOVE:** High resolution jitter plots; 48kHz/24-bit over S/PDIF (black spectrum) versus USB (red spectrum)

### HI-FI NEWS SPECIFICATIONS

Maximum Output Level/Impedance	1.95Vrms / 73ohm
A-wtd S/N Ratio (S/PDIF, USB)	108.2dB / 95.7dB
Distortion (1kHz, 0dBFS/-30dBFS)	0.0026% / 0.0013%
Distortion (20kHz, 0dBFS)	0.0027%
Frequency response (20Hz-20kHz)	+0.0dB to -0.21dB (48kHz Fs)
Digital jitter (24-bit; 48kHz/96kHz/USB)	33psec / 41psec / <10psec
Resolution @ -100dB	±0.6dB
Power consumption	4W
Dimensions (WHD)	300x60x170mm