Belt, braces and Bluetooth

There's not an awful lot that Cambridge Audio's Azur 851D DAC/preamp cannot do, Martin Pipe discovers

Those whose audiophile spirations are fettered by modest incomes can thank Cambridge Audio or supplying them with Hi-fi equipment that is well-constructed, generously-specified and sounds good - yet is affordable.

The Azur 851 Series takes pride of place at the top of Cambridge's current line-up. Despite employing some cutting-edge technology, none of these sell for more than 2500 € each; not an awful lot in the world of audiophile gear.

In terms of sophistication, the € 1399 Azur 851D is a different kettle of fish to Cambridge's popular budget DACMagic models. It takes as its basis the 851C that was introduced a couple of years ago.But out goes the disc transport and in comes a clutch of audio enhancements and tech-driven conveniences. Among the latter are a pukka headphone amplifier, extra digital inputs and Bluetooth streaming.

In place of the disc-tray is a large screen with dimmable backlight. This is flanked on either side by tiny buttons designed to access functions indicated on the adjacent areas of screen space. Beneath, the sampling rate (but alas not resolution) of the selected audio source is shown. The screen's central real-escate, meanwhile, is given over to a dB calibrated volume-level indicator. It works in conjunction with a massive control knob that's coupled to a shaft-encoder rather than a high quality pot; chat shouldn't shock you, given the 851D's emphasis on all things digital.

Cambridge hasn't opted for digical control of volume in the analogue domain, as exemplified. Instead, confirms product manager Sam Ellenby, the volume control is implemented in the digital domain. According to Ellenby, "the signal is upsampled to 32-bit floating point and then rescaled".This use of DSP (common in pro gear and software) should help to minimise non-linearities and loss of resolution at low volume levels - although ultimately you're going to be restricted by the 24-bit resolution of the DACs, a pair of Analog Devices AD 1955AS; one for each channel, working in differential mode.

If you're connecting the Azur851 D to a preamp or integrated with its own volume control, as opposed to a power-amp or active speakers, then you can bypass the volume control. An independent volume adjustment is sensibly-available for the headphone amplifier, which goes far beyond the type of circuitry you'll find in the average DAC or CD player. Built onto

a dedicated circuit board, the 851D's headphone amp has its own 'belt-and braces' power supply circuitry and complementary- pairs of medium-power transistors that drive the transducers of your choice.

As much attention has been lavished on just one aspect of the 851D's functionality as you'll find in a good budget solid-state offboarder.

There's plenty of audiophile design evident elsewhere in the 851D. Its internal power arrangements start with an over-specified toroidal mains transformer that, after rectification, supplies current to multiple regulators. Components are high grade (e.g., metallised polypropylene signal caps, audio-grade electrolytics, high-grade Burr-Brown op-amps and low-noise metal-film resistors) while board layout is neat.

Much of the digital signalproces-sing takes place in an Analog Devices ADSP-BF32 ('Blackfin') 32-bit DSP running proprietary 24- bit/384kHz upsampling algorithms developed by the Swiss company Anagram. However, the DAC only supports sampling rates of up to 192kHz.The post-DAC analogue filters are linear-phase Bessel designs.

The 851D also gives you a choice of digital-filter characteristics -'linear-phase' (time-coherent, but with some 'pre-ringing'), 'minimum-phase' (a slightly higher 'group-delay') and 'steep' (a little ringing, but a linear-phase, and courtesy of a slight high-frequency roll-off, a strong rejection of 22.05 kHz aliasing artifacts). Cambridge's advice is pragmatic ; it suggests 'experimenting with the filters to determine which sounds best to your ears' with each programme source.

The company has also been pragmatic as far as the rear-panel is concerned .You get two inputs with coaxial (phono) and optical (TOSlink) connectvity, two optical only inputs,a BNC coaxial-only input and a professional AES/EBU terminal. Coaxial and optica! outputs convey the selected input unaltered (i.e. with no upsampling, volume adjustment or filtering performed) . Useful for chose with digital recorders or separate AV systems, I guess.

Inside the 851D. At the bottom left can be seen the sophisticated headphone amplifier. The preamp/DAC and terminal boards, which are populated with decent-quality compo-nents, nestle around the rear panel.

A Class-1/2 USB port with ground-lift switch enables you to use Inside the 851D. At the bottom left can be seen the sophisticated headphone amplifier. The preamp / DAC and terminal boards, which are populated with decent-qua/ity compo nents, nestle around the rear panel.

The Azur 851D as a high-quality DAC with your computer (Windows and Mac, although some Linux distros are compatible). Users with Mac and Linux systems can 'plug and play'; Windows users (XP / Vista/ 7/8) may need to download the necessary driver.

A second USB port is provided for the supplied Bluetooth dongle needed to play audiofiles held on your phone or tablet - you can't, alas, use it to play music files on USB storage devices. A pity; I suspect it would have cost Cambridge little if anything to support playback of uncompressed (e.g. WAV / AIFF) files or for that matter FLAC (lossless) ones.

The rear panel analogue outputs take the form of balanced (XLR) and phono (unbalanced) sockets.

It's a shame, considering the 851 D's preamp possibilities, that no provision for analogue sources has been made. But chat would have meant building in an analogue-to-digital converter and thus upping the price. Interestingly, the unit's AD 1955A DAC can accept DSD - a feature that's not harnessed here.

The supplied remote handset is distinctly Cambridge - solidly-built Practically any digital source can be fed into the 851D. There are no fewer than six digital audio inputs plus a pair of USB ports tor computer DAC and Bluetooth use. The analogue output is available in unbalanced (phono) and balanced (XLR) form. The 851D also makes provision tor custom installation (RS232, remote in, 12V DC trigger out and Cambridge's contra/ bus). with a pleasant feel. It provides access to all of the 851 D's functions and will operate some other Cambridge gear.

PERFORMANCE

I tried the 851D with a number of digital sources that included a Cambridge Azur 751BD disc player and Squeezebox Touch streaming/SD/ USB player, both

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fed via the coaxial inputs. A Samsung Galaxy S4 Mini was used to test the unit's Bluetooth capabilities. A Linn LK280 amplified the DAC's output, driving my trusty Acoustic Energy AE 109 floorstanders. I also tried the headphone output, alternating between Sony MDR-1 Rs and Onkyo ES-HF300s.First, playback from disc. Initially, I tried a Blu-ray audio disc (Supertramp's 'Breakfast in America') but sadly couldn't get anything more than 48kHz PCM audio - a clear case of 'downsampling' being imposed to prevent the disc being used as a high res medium for pirates to work with!

However, even the enforced 48kHz output yielded a fair degree of musical insight - albeit with the overly-incisive treble traditionally associated with this classic slice of late-70s art-rock. I guess that if you have something close to the master tape to downsample, then the results are going to be good.A self-made DVD-A disc containing careful 24/96 transfers of various LP material was more revealing and showed that the full potential of such material can be conveyed via the digital inputs.

All well and good, but as for most of us, CDs make up the bulk of listening, I gave these a spin - the original 44.1kHz/ 16-bit format being upscaled to the l 92kHz/24-bit supported by the DAC.

First, then, to a copy of Can's sprawling but hypnotic Krautrock epic 'Tago Mago'. Overall impressions were ones of neutrality and transparency; you're given an uncoloured musical insight.The other-wordly 'Mushroom' was defined by a fulsome and coherent bass performance - nothing lightweight or overblown here - coupled with a taut handl ing of percussive matters. With 'Tago Mago' and 'Halleluhwah' you're given an insight into the track's contribute to a gloriously detailed fuller picture.

The Bluetooth feature is easy enough to use; scan for devices and pair with the newest one found. It sounded more than acceptable - especially with losslessly - compressed tracks - although absolute sound quality is being traded for the convenience of accessing music held on a mobile device.The musical balance was even, although some of the finer detail of complex tracks was masked.

Supplied with every 851D is this BT100 'dongle', which plugs into a dedicated USB socket on the rear panel. With it, you can play music stored on your tablet, smartphone or other portable device.

CONCLUSION

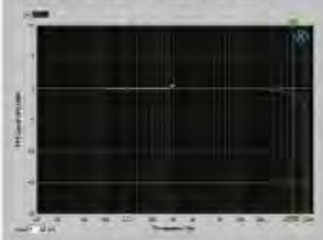
You get an awful lot of DAC for your money, and better still the numerous features (among them, a worthy headphone amp and wide connectivity) are backed up with a convincing sound quality.

That's not to say the Azur 851 D is perfect; at very low listening levels, there's a slight veiling of dynamics caused by the digital control.This isn't an issue, of course, if you are driving amplification that makes its own

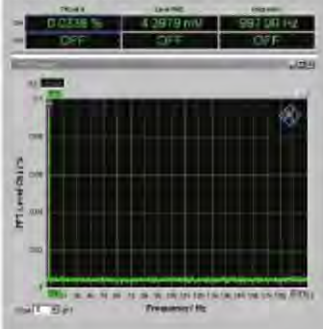
MEASURED PERFORMANCE

Frequency response was flat to 60kHz with a 192kHz sample rate digital input, the filters making little difference either at this sample rate or at 44.1kHz sample rate (where 'slow' filters can roll off high treble). The optical S/PDIF input receiver accepted 192kHz, where many still do not – a good point since many digital devices use optical only.

FREQUENCY RESPONSE



DISTORTION



Audio output from the phono sockets (unbalanced) and the headphone output measured a standard 2.2V, and from the XLR sockets (balanced) 4.4V. Higher output from the latter bestowed the 851D with 116dB EIAJ Dynamic Range, a good if unexceptional figure, whilst from the phono sockets this dropped 1.5dB to 114.5dB.

Top DACs now manage 122dB, to get this into context, but CD (i.e. 16bit) manages 100dB, so the 851BD exploits high-resolution digital well, offering clear benefit over CD, but it isn't quite up with the best, notably Audiolab's M-DAC (and Q-DAC) with its ESS Sabre32 chip. Distortion levels were very low all round.

The Cambridge Audio Azur 851D digital preamp measured well in all areas, giving very similar results to earlier Cambridge DACs based on the Wolfson DAC chip, but rivals march ahead. **NK**

Frequency response (-1dB)	
CD	**4Hz - 60kHz**
Distortion (24bit)	**%**
0dB	**0.0002**
-60dB	**0.035**
Separation (1kHz)	**112dB**
Noise (IEC A)	**-115dB**
Dynamic range	**116dB**
Output	**2.2/4.4V**

AZUR 851D DAC/ PREAMP, €1399

EXCELLENT - extremely capable

VERDICT

It sounds good, looks good and continues the Cambridge Audio philosophy of offering the best possible value for money. There are criticisms, but in the great scheme of things they're fairly minor.

FOR

- a sensible design, well-built
- a hint of the high-end at a mid-range price
- capable headphone amplifier

AGAINST

- volume control (defeatable) implemented digitally
- no provision for analogue inputs

Cambridge Audio
www.cambridge-audio.com