



DAC/HEADPHONE PREAMP

Headphone preamp/USB DAC
Made by: Questyle Audio Technology Co. Ltd, China
Supplied by: SCV Distribution, Hertfordshire
Telephone: 03301 222500
Web: www.questyleaudio.com; www.scvdistribution.co.uk
Price: £989

AUDIO
FILE

Questyle CMA600i

An up-and-coming Chinese company with strong US connections, Questyle brings cunning tech to its DAC/headphone amp line, including this new entry-level model
Review: **Steve Harris** Lab: **Paul Miller**

Though Questyle makes digital audio players and standalone DACs, and is embracing wireless technology, it was a high-end headphone amp that got the brand started. Now this go-ahead young company has trickled down the technology of its earlier products into the £989 CMA600i DAC/headphone amp reviewed here.

Headquartered in Shenzhen [see boxout, facing page], Questyle also has a US sales arm based in Las Vegas. The products are assembled by Foxconn, the giant contract manufacturer whose vast factories build everything from phones to laptops to games consoles to LCD televisions, for Apple, Samsung, Sony and many other global brands.

INNOVATIVE THINKING

But what makes Questyle stand out from the crowd is its degree of genuine technical innovation, most prominently its patented 'Current Mode Amplification' (CMA). This circuit technique claims to offer a very wide, low distortion bandwidth driven from a very low source impedance, thereby enhancing its compatibility with low or variable-impedance headphones [see PM's Lab Report, p63].

Moreover, while the CMA600i comes in at less than half the price of Questyle's top-end £2100 CMA800i, it still offers CMA and 'True DSD' decoding. It also retains the pricier model's use of a separate circuit for the line preamp, rather than using the headphone amp section for both purposes, and has the same high-precision 'mutual bit' case construction. This is said to improve heat stability and tolerance to vibration while also offering excellent shielding from RFI/EMI interference.

In fact, Questyle states that it uses components at the same quality level for the cheaper model. The main difference is in the DAC section. For the CMA800i,

Questyle uses the Wolfson WM8741 converter with user-selectable filter options and its own analogue output stage. In the CMA600i, the Wolfson DAC gives way to AKM's AK4490 chipset, itself a class act capable of handling DSD64, DSD128 and DSD256 as well as LPCM music files up to 384kHz/32-bit, should they exist.

A further variation on Questyle's '800' theme is the CMA800r, priced halfway between the CMA800i and CMA600i. This model's unique feature is its 'Mono Full Balanced' operation option, requiring a second CMA800r, so that one unit is used for each channel. Along with its conventional unbalanced stereo inputs and outputs, the CMA800r has stereo balanced analogue line inputs but only single-channel balanced line and 'phone outputs.

By contrast, the CMA600i does not offer the Mono Full Balanced option, nor does it have balanced analogue inputs, but it does have balanced line outputs and a four-pin balanced headphone output. If this doesn't all sound too confusing, it should be clear by now that the CMA600i is designed to offer a pretty full set of features, despite its entry-level status.

Front-panel controls start with a miniature toggle switch for on/standby. After this comes a row of four blue LEDs, and another mini toggle that selects between 'USB' and 'Digital' inputs, the latter meaning S/PDIF, whether coax or Toslink. Selection is confirmed by one of the first two LEDs, while the remaining pair indicate whether a PCM or DSD input is present. There is no visual indication of incoming sample rate, though.

A TRIO OF OUTPUTS

In the centre of the fascia are two 6.35mm (1/4in) headphone sockets and a single four-pin socket for balanced operation. The manual warns that you must not connect headphones to all three outputs at once, and if using both unbalanced jacks at the same time, the headphones need to be of the same type.

Between the headphone connectors, as well as the IR window for remote commands, is a third toggle switch that provides a bypass for the DAC section. With this set to 'Internal', the CMA600i operates as a DAC/headphone amplifier, while set to 'External' it operates as a



RIGHT: No shortage of audiophile thinking: linear PSU, X MOS USB input, AK4490 DAC, motorised analogue volume control and four custom op-amps driving the balanced output





headphone amplifier only, running from any suitable connected analogue source. In this mode, in seeming contradiction to the owner's manual, the CMA600i still also gives a 'preamp' output via the balanced or unbalanced rear connectors. This output does not automatically mute when you plug in headphones.

Finally, on the far right, is the CMA600i's volume control. This is a 'proper' analogue control using an ALPS 16 potentiometer, motorised to support remote control, which is provided by '±' buttons on a neat little handset [see p63]. The handset also has a useful mute button, but note that this operates only on 'Internal' digital sources and will not mute the output, either to the headphones or the line sockets, if you have the front-panel mode switch set to 'External' and are using an analogue input.

Thanks to the unit's slim proportions, the rear panel is almost filled by the connecting socketry. Alongside the USB type B connector are S/PDIF digital inputs, both Toslink optical – not fitted on the CMA800i, by the way – and coax (RCA),

with a slide switch to select between them. There's also a coaxial S/PDIF output.

Analogue outputs are in the centre, comprising a pair of standard RCA phonos flanked by balanced XLRs. Unusually, next to the IEC mains inlet, is a user-accessible mains voltage selector, useful if you are travelling with your CMA600i. Hooking up to a PC will require the supplied driver, but no set-up is required for a Mac. It appears in the System Preferences Sound pane as 'xCORE USB Audio 2.0', revealing the source of the USB interface as XMOS Ltd. Questyle's owner's manual contains further information on this, as well as full instructions on setting up DSD replay on J River, and also on installing foobar2000.

UNCLUTTERED AND TUNEFUL
As a DAC with a CD transport source, the CMA600i immediately proved its worth. On orchestral music it could give a convincing and engaging separation between instruments and an expansive soundstage. Listening to Respighi's *Church Windows* [Reference Recordings RR-15CD]

'It was as crisp and wholesome as a "clean-linen" room spray'

ABOVE: Front-panel socketry includes two unbalanced headphone sockets plus one four-pin balanced connector. The analogue volume control is motorised for remote operation

I waited as usual to see what happened when the gong crash ended 'St Michael' and wasn't disappointed, as the gong had the impact of real metal and its long decay was awesome.

Of course, this is only one small detail in a recording that is full of intriguing sounds and timbres, and this time round I was also particularly drawn to the spooky, menacing horn sounds in the final 'Window', 'St Gregory The Great'. Here, too, the organ sound was magnificent.

Moving on to non-classical material, the CMA600i always seemed able to reveal what the music had to offer without adding any character of its own. With the clean, clear studio soundscapes offered by Olivia Trummer's *Fly Now* [Contemplate CMN14005], it came up as crisp and wholesome as a 'clean-linen' room spray, but without the sense of anything being covered up that this analogy might imply. Even in the sections where Trummer's accompanists play louder and harder to work up a climax, the sound was uncluttered, well founded on a tuneful bass and generally open and free-breathing.

Switching to the Toslink optical connection didn't result in too serious a loss of quality. With Trummer's 'Precious Silence', for example, it could just seem that there was a subtle softening of edges, and you got the feeling that there wasn't quite the same precise delineation of, and separation between, the instrumental sounds in the stereo stage. But it was hard to fault the CMA600i here.

Still working with the CMA600i as a DAC via its line outputs, I happily moved onto the USB input and to hi-res material from the Mac. Inevitably I turned to the usual HDtracks material, starting with the Minnesota Orchestra and Rimsky-Korsakov's 'Dance Of The Tumblers' from ➞

THE STYLE QUEST

Even as a small boy Questyle's founder Wang Fengshuo (Jason Wang) was obsessed with electronics and guitars, and he built his own amplifiers while still in high school. In 2004, studying electronic engineering and working with current-mode communication circuits, he was struck by the possibilities of current-mode amplification for audio. He stayed at the university through the summer holidays with a group of other students, aiming to build an amplifier of 'unparalleled performance'. They built a prototype, published their results and took out a patent. But this experimental amp needed ultra-close matching of transistors, and could never be put into production. After graduation, Wang joined an American IC design company. Around that time he bought a pair of Sennheiser HD 800 'phones and, disappointed by the amp that was recommended, decided to design his own. With the help of a senior colleague and a UCLA professor, this spare-time project led to the first Questyle product, the CMA800 headphone amp of 2007. And in 2012, Wang quit his job to set up the company in the Central Business District of Shenzhen.

DAC/HEADPHONE PREAMP



ABOVE: USB and both Toslink and coaxial S/PDIF digital inputs are joined by a coaxial digital output, single-ended analogue line in, line out and balanced line out on XLRs

The Snow Maiden. Here there was lots of enticing detail, with a fine treble quality reflected in the clarity of cymbals and even the triangle, and at the opposite end of the spectrum an attractive and realistic 'whoomph' from the basses in that big hall acoustic.

Turning to headphones, in my case the excellent Oppo PM-1 [HFN Jul '14], I started with 44.1kHz material ripped from CD, and immediately warmed to the sound of the CMA600i. On every track I tried, it seemed that the headphone amp section was able to bring the music up as fresh and wholesome.

VIBRANCY AND DETAIL

An outstanding example was the Mozart Oboe Quartet from *The Art Of Janet Craxton* [BBC CD 635], from 1981. Listening to this now relatively ancient analogue recording on headphones particularly, you inevitably become aware of some tape noise. But this wasn't much of a distraction when the instruments were presented well as individual sound sources yet also as a coherent whole. The CMA600i brought out the beautiful singing sound and absolute assurance of Craxton's oboe with all its subtleties of phrasing, but in fact it also revealed the wonderful musicianship of all four players in her London Oboe Quartet, so palpably playing together as with a single mind.

Indeed, given a natural-sounding recording, the CMA600i seldom failed to engage the ear. I found a fine example of its prowess with a simply-captured vocal/guitar piece in 'Seaside', the memorable little solo offering from Luke Pritchard that opens The Kooks' *Inside In/*

Inside Out [Virgin 0094635072426]. Here the big and harmonically rich sound of Pritchard's acoustic guitar was brought out with great vibrancy and detail, and you could admire the way he shades the dynamics of his playing to complement the vocal in telling the story of the song. His guitar was always balanced perfectly against his voice, which is intimate, close-miked and yet with just enough 'air' around it, in a performance that had real immediacy and impact.

But of course, the ultimate *raison d'être* of a product like this is its ability to get the best out of higher-quality source material on headphones. With Chesky's 96kHz/24-bit file of 'Lucia', from the Marta Gomez album *Entre Cada Palabra* of 2006, the CMA600i breathed out the music in a delightfully calm atmosphere.

Its gently flowing rhythm was entirely captivating here, Marta's voice velvety and delightfully soft-edged but with a really tangible presence, while the guitar resonated tellingly through the recorded acoustic and the accordion obbligato seemed a masterpiece of sensitive accompaniment. ☺

HI-FI NEWS VERDICT

Beautifully built and finished, the CMA600i offers a rhythmically persuasive, cohesive sound, if perhaps not quite matching the ease and grainless transparency that's to be had with the very finest DACs. Despite its separate line amp circuit and excellent volume control, it has only limited usefulness as a preamp, but viewed purely as a high-quality DAC/headphone amp, it will take some beating at the price.

Sound Quality: 84%

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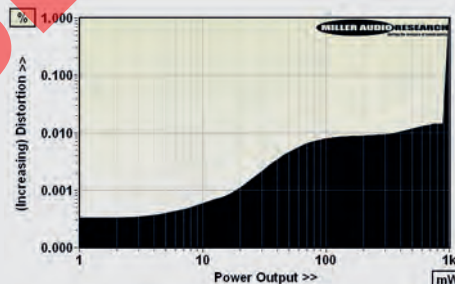


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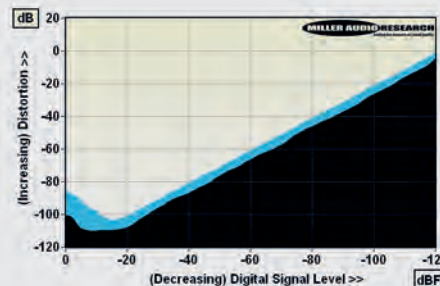
QUESTYLE CMA600I

This is a versatile analogue/digital preamplifier and headphone amplifier although one that is arguably best served via asynchronous USB (the S/PDIF input failed to lock reliably at 176.4kHz and 192kHz). Tested as an outboard DAC at a standard 4V/balanced XLR out (maximum balanced output is 8.7V), distortion settled at a low 0.001-0.006% (20Hz-20kHz) falling to a minimum of 0.0003% over the top 20dB of its dynamic range [see Graph 2, below]. The 110dB A-wtd S/N ratio is impressive and consistent between S/PDIF and USB inputs although the latter offers x10 lower jitter: 30psec vs. 300psec. The IIR digital filter is common to all digital inputs, offering a 69dB stopband rejection (48kHz Fs) and trading zero pre-ringing for increased post-transient ringing. The response amounts to -0.1dB/20kHz, -1.3dB/45kHz and -5dB/90kHz with 48kHz, 96kHz and 192kHz media via the USB input.

Tested as a headphone amp, the analogue (ALPS16 potentiometer) volume control governs the maximum +13.5dB gain where distortion falls as low as 0.00015% via the single-ended headphone output. Distortion increases more rapidly into an 'average' 25ohm headphone load at higher frequencies, from 0.0003% to 0.0034% (unloaded/loaded) at 1kHz to 0.001%/0.04% at 10kHz and 0.002%/0.08% at 20kHz. The headphone out has a fabulously low <1ohm source impedance over the broad swathe of the CMA600i's volume range while the A-wtd S/N is a wide 95dB (re. 0dBV) and hum very low indeed at -98dBV (0.013mV). The response is flat to within +0.0/-0.04dB from 20Hz-20kHz and -0.45dB (unloaded) to -0.7dB (loaded) at 100kHz. The power output is a substantial 993mW (a fraction under 1W/25ohm), as indicated by Questyle's specification [see Graph 1, below]. PM



ABOVE: Continuous power output versus distortion into 25ohm 'headphone' load



ABOVE: THD vs. 48kHz/24-bit digital signal level over a 120dB dynamic range (1kHz, black; 20kHz, blue)

HI-FI NEWS SPECIFICATIONS

Maximum output (re. 1% THD into 47kohm)	8700mV
Max. power output (re. 1% THD into 25ohm)	993mW
Output Impedance (20Hz-20kHz)	0.83-0.98ohm
A-wtd S/N ratio (re. 0dBV/ digital re. 0dBFS)	94.6dB / 110.3dB
Frequency response (20Hz-20kHz/25ohm)	+0.0dB to -0.04dB
Distortion (20Hz-20kHz, re. 10mW/25ohm)	0.0009-0.075%
Digital jitter (S/PDIF / USB)	300psec / 30psec
Power consumption	14W
Dimensions (WHD) / Weight	330x55x300mm / 3kg