

Auralic Sirius G2.1/Vega G2.1

Auralic's latest streamer/DAC combines with its upsampling processor, and at first glance there seems to be some duplication of effort. So how do they work together?
 Review: **Andrew Everard** Lab: **Paul Miller**

The trouble with many modern hi-fi ranges is trying to work out what each of the boxes does. I've recounted before the tale of the tower of identical-looking Linn components stacked up in the premium lounge of a well-known airline, and the amusement there was in watching 'elite' passengers trying to work out where to insert their Dire Straits CD. Similarly, Auralic also has a wide range of digital devices, and given that they all look alike, it's sometimes hard to work out what does what.

Things are further confused by the fact many Auralic products are multifunctional. The Vega G2.1 we have here, selling for £6799, may be 'first and foremost a performance-focused DAC' (as the company puts it), complete with a comprehensive suite of inputs including USB-B for computer hook-up, but it's also a network player, interfacing with the company's Lightning DS app to play music from local storage, online streaming services and Internet radio. Via USB-B or streaming inputs, it will accept file formats up to 384kHz/32-bit and DSD512, and it has both XLR and RCA analogue outputs, complete with a volume control if required, and a pair of 6.35mm headphone outputs for personal listening.

SUPER SLICK

Why, then, would you need the Sirius G2.1, at another £6799 – and more to the point, what actually is it? Auralic describes it as an 'Upsampling Processor', able to convert all incoming digital signals in steps up to DSD512 or 384kHz, and then feed them to a DAC via the company's proprietary Lightning Link [see boxout, p51]. But that simple headline description only scratches the surface of what this unit can do. Dig into its menus and you'll discover there's a

RIGHT: Inside the Sirius G2.1 three linear PSUs [top] feed separate areas of the digital input/output – including XMOS USB [bottom left] and CS8406 S/PDIF and AES transmitter – and 'Proteus' co-processor (a Xilinx XC7A200T FPGA with 512MB RAM) running proprietary code

wide range of resampling options built into the upsampling process, so you could set a different upsampling for just about every digital input format and sampling rate, plus the inevitable choice of digital filters.

There's also – and this is rather more than a mere also – an eight-band parametric equaliser on board, and even adjustments for gain and delay, the latter set by inputting distance, to compensate for the location of your loudspeakers relative to your listening position.

And if you really wanted to go even further, you could add to this duo the £4799 Aries G2.1 streamer [HFN Oct '21], which brings with it the option of internal storage for your music collection as well as the usual ability to stream from network-connected storage. And, as icing on the cake, there's the company's Leo GX.1, an £8799 master clock for the whole system,

which will take control of the digital reference for a number of Auralic units.

In practice, a 'solo' Vega G2.1 is a very comprehensive offering in its own right, so if you're purely committed to network streaming, be it from local storage or online services, then it will more than suffice. Moreover, working with the company's super-slick app, and with the bonus of its own suite of digital (and analogue) inputs, it will operate as a hub/preamp straight into a power amp or active speakers, or into a preamplifier.

EARNING ITS KEEP

If, however, you also have legacy digital sources to connect into the system, or want to take advantage of all that equalisation or room correction, then the Sirius G2.1 will start earning its keep, though it should be noted that the addition



of the upscaler will have no effect on your network-streamed music. Yes, there's an Ethernet port on the back of the Sirius 2.1, but it's only there for firmware updates and not streaming duties, so the prosaic description is that the upscaler works as a digital switching hub: connecting it to the Vega G2.1 via the Lightning Link disables the streamer/DAC's conventional electrical and optical digital inputs.

Both units are substantially built, with the now-familiar 'copper chassis within an aluminium outer casing' construction [see p55] of all the latest Auralic models. The Vega sticks with the company's tried-and-tested platform seen in the Aries G2.1 [HFN Feb '21] and

Altair G2.1, with an Auralic-modified ESS Sabre DAC combined with its proprietary Orfeo analogue stage, including passive volume, and that line input. With so much capability here, I confess that it took me

a while to work out how to set it all up, and make valid comparisons between the Vega G2.1 alone, and the streamer/DAC with upscaling processor added.

I ended up switching between my MacBook Air connected direct via USB to the Vega G2.1, and then via the Sirius G2.1, and doing the same with the digital output of my Naim network player. As ever I played with the digital filters of the Sirius [see PM's Lab Report, p53], came to no conclusive

'The L-Link is both a data and control interface'

ABOVE: Both the Sirius upsampler [top] and Vega G2.1 [bottom] have 4in TFT displays that are synchronised when Auralic's L-Link is used. Info includes input channel, volume, sample rate, playback status and configuration settings

findings, so then ignored them, sticking to the 'smooth' option for all my listening. Of more interest were the equaliser and speaker correction settings: having hefted my speakers into obviously wrong positions, it was impressive that I was able to get them back to sounding correct, which bodes well for those whose living space dictates sub-optimal positioning.

⚙️ SUPER RICH

Trying a wide range of music sources and formats, what immediately became clear was that, while playing music into the Vega G2.1 directly at high resolutions showed no advantage with or without the Sirius G2.1 in the chain, lower-resolution file formats showed enhanced air, space and detail with the upscaler activated. For example, playing the 320kbps Radio 3 HD stream of Proms concerts sounded richer and more substantial, with an overall greater sense of involvement when played from my laptop via the Sirius when compared to using the Vega G2.1's Internet radio capability.

The National Youth Orchestra of Great Britain's performance of Danny Elfman's *Wunderkammer*, written for the orchestra, was both more vibrant and thrilling via the Sirius G2.1, from its exuberant opening to the stabs of brass and percussion and dancing strings. The same went for CD-quality files (or 48kHz/24-bit) played through the two-box chain. Guitarist Bernie

SPECIAL LINKS

Connecting the Sirius G2.1 to the Vega G2.1, and indeed other Auralic devices including the Aries G2.1 Streaming Transport [HFN Feb '21] and Leo GX.1 Master Clock, is the company's proprietary Lightning Link, which uses a modified version of the HDMI connector. Familiar though that may look, the design means you can't use generic AV-type cables, but must employ the cables supplied with Lightning-compatible Auralic products. Lightning Link is a combined data and control interface, described by the company as a 'low-jitter, bi-directional 18Gbps coupling that opens the door to jitter-free operation of all the devices in your system'. Clocking information is also transmitted back from the receiving device to the unit sending, for data synchronisation. It also carries system control data for everything from volume control to processor engine setup, allowing all linked Auralic devices to appear in a single, unified control interface.

From the earliest days of the standalone DAC, manufacturers have been trying to improve the integrity of data flowing between devices. Externalising the 'Inter-IC Sound' (I²S) system has been a popular method as this protocol carries the clock and data signals separately, rather than requiring the receiving device to recover and reconstruct the clock information buried within the datastream.

AURALIC SIRIUS/VEGA G2.1



ABOVE: The Vega 2.1's linear PSU [top right] feeds the screened-off DACs [top left], ladder volume controls [centre left] and 'Class A Orfeo Output modules' [heatsink, bottom left]

Marsden's 2021 *Chess* set [Conquest Music; 44.1kHz/24-bit] gained more of the impression of a band jamming together via the Sirius, which had the effect of opening up the already weighty, driving sound of the Vega G2.1 when used on its own.

EXTRA SLAM

More subtle were the gains when running DSD64 files through the Sirius G2.1, but they were there to be had. Playing a rip of *The Velvet Underground & Nico* in DSD64 [from Polydor UIGY-9608] showed the upscaling in the Sirius G2.1 was making the 1967 mix a little more explicit without trading any of its rawness. By comparison the direct-to-Vega stream was just a little softer and a bit more polite, whether with Nico's vocals on 'Femme Fatale', the snarl of 'I'm Waiting For My Man' or the strangeness of 'Heroin'. In these cases the upsampling processor seemed to bring a little extra drive and expression.

The same benefits were apparent with very different recordings, including the recent box-set release of the complete Brahms symphonies by the Danish Chamber Orchestra under Adam Fischer on the Naxos label [8574465-67]. Playing the CD-quality version – it's also available as a 192kHz/24-bit download – I thought it sounded just a shade thinner via the Vega G2.1 alone. With the Sirius G2.1 in the chain, however, the music gained

'The music gained both substance and space'

both substance and space, not to mention an extra serving of dynamic impact, bringing out more of the interplay between the musicians, and the subtleties of the scoring.

Without a doubt, the Sirius G2.1 is a worthwhile addition if you're going to play music into your Auralic DAC from lower-resolution files, but as you might expect, its effect gets more subtle the higher the incoming

data rate. However, it's also worth noting that it's not simply a unit whose use is restricted to an Auralic eco-system – as well as outputting to the likes of the Vega G2.1 via that Lightning Link,

it can also feed other DACs via USB, electrical and optical outputs.

THE ENTERTAINER

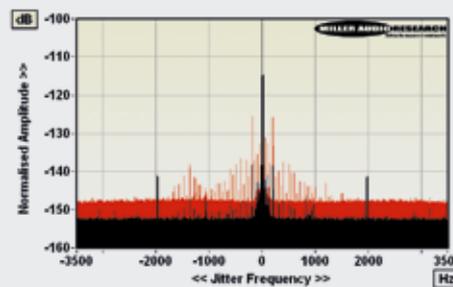
OK, so the 'conventional' digital outs have the usual limitations – 192kHz/24-bit and DSD over DoP – but using the USB connection opens up a wider range of formats, depending on the DAC you choose to partner with. You can adjust the maximum data rate in the extensive menus of the upscaler, and I spent an amusing few hours playing the Sirius G2.1 through a variety of 'desktop' DACs, from the DSD256-capable Chord Mojo 2 [HFN Apr '22] ↗

This Auralic pairing warrants two separate Lab Reports, not just because we have 'two boxes' in for review but because the very flexible resampling options offered by the Sirius G2.1 have the potential to alter the 'analogue' performance of the Vega G2.1 and, presumably, any other partnering DAC. Choosing to resample an LPCM digital input to an LPCM output of 48kHz-384kHz has no impact, say, on response (unless you are downsampling from 96kHz+ to 48kHz, etc) but it does cause a slight change in peak output level from 4.55V to 4.65V from low to high sample rates. Choosing a format conversion from LPCM to DSD via the Sirius G2.1 results in a far greater 0.7dB reduction in analogue output, and 0.6dB loss in S/N ratio, from the Vega G2.1 – potentially sufficient to skew a critical A/B comparison.

Distortion, too, changes whether an LPCM or DSD bitstream is fed into the Vega G2.1. At high levels (–5dBfs to 0dBfs) THD is a uniformly moderate 0.0012%/1kHz, regardless of sample rate or format, but at –10dBfs (a 'busy' area for much digital media) it falls to a significantly lower 0.00003% via a DSD64-DSD512 bitstream. Jitter also reveals differences in the LPCM and DSD resampling – this time in 'favour' of the former which achieves a vanishingly low 14psec versus 55psec (largely PSU-induced jitter) for the same 48kHz/24-bit data in DSD64-512 guise [see Graph].

In common with the earlier Altair G2.1 [HFN Oct '21], both the Sirius and Vega G2.1 offer four alternative digital filters – Precise, Dynamic, Balance and Smooth. These are duplicated but not 'doubled up' if the Sirius and Vega are used in combination. The Dynamic and Precise filters are linear phase/apodising types offering between 122-124dB of stopband rejection, but the 'Precise' offers the flattest and most extended response, reaching out to –3dB/45kHz and 90kHz with 96kHz/192kHz media versus –3dB/36kHz and 64kHz for the Dynamic filter.

The Balance and Smooth options offer a reduced 14dB and 18dB stopband rejection, with far gentler HF roll-offs amounting to –3.4dB and –4.2dB/20kHz, respectively, with CD and 48kHz files. With higher-rate files these filters reach just –3dB/28kHz and –3dB/47kHz (96kHz and 192kHz media). However, while their magnitude responses are similar, their time domain behaviour is very different – Balance is a low-order linear phase filter while Smooth is a low-order minimum phase/hybrid type with almost no acausal pre-ringing but a non-linear group delay. The respective time (impulse) and frequency responses with 48kHz media (solid traces), 96kHz (dotted) and 192kHz (dashed) are colour-coded in black and red for Precise and Smooth filter options [see Graph, p55]. The test table [below] refers to the Sirius and Vega G2.1 in combination. PM



ABOVE: High res. jitter spectrum via Sirius G2.1 over L-Link to Vega (upsampling – LPCM, black; DSD, red)

HI-FI NEWS SPECIFICATIONS

Output level (48kHz/384kHz/DSD64/512)	4.55V / 4.65V / 4.19V / 4.19V
A-wtd S/N (48kHz-384kHz/DSD64-512)	116.1dB / 115.5dB
Distortion (1kHz, 0dBfs/–10dBfs; DSD512)	0.0011% / 0.00003%
Distortion (20kHz, 0dBfs/–10dBfs; DSD512)	0.005% / 0.00015%
Freq. resp. (20kHz/45kHz/90kHz; 384kHz)	+0.0 to –0.2dB/–3.8dB/–5.2dB
Digital jitter (48kHz-384kHz/DSD64-512)	14psec / 62psec
Resolution (re. –100dBfs / –110dBfs)	±0.1dB / ±0.4dB
Power consumption (Sirius G2.1)	16W (14W standby)
Dimensions (WHD) / Weight	340x96x320mm / 9.5kg

AURALIC SIRIUS/VEGA G2.1



ABOVE: Sirius G2.1 [top] includes LAN control input plus digital in/out on coax, Toslink and AES (DSD64/192kHz) plus USB and L-Link in/out (DSD512/384kHz) on HDMI. Vega G2.1 [bottom] has complementary digital inputs, an external clock input, analogue line inputs and fixed/variable analogue outputs on RCA and balanced XLRs

to the iFi Audio Neo iDSD [HFN Mar '21], which can handle DSD512. Using the Sirius G2.1 between iFi Audio's Zen Stream transport and the Neo iDSD was an entertaining experience – although this hardly qualifies as a typical set-up!

WORTH THE WEIGHT

Do you need the Sirius G2.1? By now you should have formed an opinion. Given that the Vega G2.1 is already an excellent network player and DAC, with an analogue input which is also very good indeed – as I ascertained using my Naim player via its line-out – and that it can also function as a preamp, you'd be forgiven for thinking just the one box would do you very nicely indeed. Across the time I spent with this Auralic pair, I found the Vega G2.1 a highly entertaining performer across a range of musical styles, not least because that Lightning DS system is so simple and logical in use.



ABOVE: Hidden under the Sirius G2.1's top-plate, and screening the digital electronics within, is a branded, copper-coloured enclosure. The Vega follows suit

Freed from all the digital frills delivered by the Sirius G2.1 – impressive though they are – the Vega G2.1 has a directness of sound to match its fuss-free operation, combining weight and presence, detail and speed. In my listening, these characteristics were as much in evidence when exploring the baroque jazz-prog wonderfulness of Frank Zappa's *Shut Up And Play Yer Guitar* set [Rykodisc RCD 10533/34/35] as with the relaxed blues-rock of Snowy White's *Driving On The 44* [own label, SWWF 2022], where it delivers a gloriously characterful guitar sound.

So the Vega G2.1 is an accomplished all-rounder, building on the strengths of past Auralic models reviewed in these pages. The large display and heavyweight but oh-so elegant casework ticks the pride of ownership box, ensuring either the Vega or Sirius/Vega G2.1 will fit in with almost any system while delivering a sound that's up there with the very best. ☺

HI-FI NEWS VERDICT

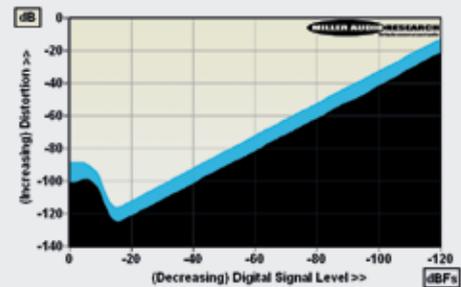
Whether or not you need this full two-box set-up will be down to your own digital audio system: the Vega G2.1 is a remarkable streamer/DAC in its own right, with a substantial, super-detailed sound and a slick operational interface. But if you are considering *additional* digital sources, the Sirius G2.1 is a technical *tour de force*, capable of enhancing almost any audio format with which you feed it.

Sound Quality: 87%

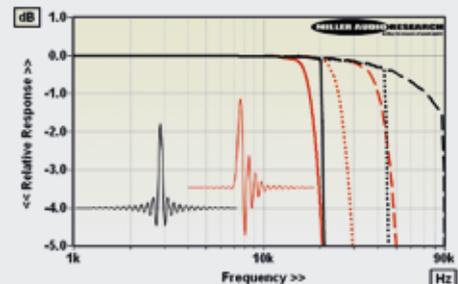


The Vega DAC has steadily evolved since its first-generation platform was tested [HFN Jan '14] with improvements in processing speed, functionality, file format handling and technical performance. Not that the 'Vega G1' was especially tardy, offering distortion as low as 0.00004-0.0004% from 20Hz-20kHz over the top 30dB of its dynamic range together with a full 115.8dB A-wtd S/N ratio. The Vega G2.1 still employs a 'tweaked' ESS Sabre DAC and Class A 'Orfeo' analogue output stage but the latter has been refined to offer a higher 4.65V output (from 4.1V) and a slightly wider 116.5dB A-wtd S/N ratio, but the impressively low 'drive any interconnect/line input' 0.25ohm source impedance remains untouched. In practice while the Vega G2.1's distortion still drops to as low as ~0.0001% over the top 30dB of its range (20Hz-20kHz) its peak level distortion is higher at 0.0013-0.005% [see Graph 1, below], either as a result of the analogue stage's higher gain or as a result of Auralic's 'sound tuning'. Either way, these distortion figures are still 100-1000x lower than the average loudspeaker at 90dB SPL, so it's always worth keeping some perspective!

Although Auralic specifies its own master clocks for the Vega G2.1, the jitter rejection performance of these ESS DACs is already well proven. Digital jitter was vanishingly low in the Vega G1 and it remains so here with a correlated figure of <15psec across all LPCM sample rates and inputs (the Vega G1 lacked the G2.1's network connection). In the analogue domain, the Vega G2.1 also impresses – the R-2R ladder volume control maintains a tight 0.02dB channel balance while stereo separation is a full 135dB/1kHz through the Orfeo gain stage. PM



ABOVE: Distortion vs. USB 24-bit digital signal level over a 120dB range at 1kHz (black) and 20kHz (blue)



ABOVE: Frequency and time (impulse) responses for Precise (black) and Smooth (red) for 48kHz media (solid traces), 96kHz (dotted) and 192kHz (dashed)

HI-FI NEWS SPECIFICATIONS

Maximum output level / Impedance	4.65Vrms / 240-300mohm
A-wtd S/N ratio (USB / Network)	116.5dB / 116.5dB
Distortion (1kHz, 0dBFS/-30dBFS)	0.0013% / 0.00015%
Distortion & Noise (20kHz, 0dBFS/-30dBFS)	0.005% / 0.0003%
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	+0.0 to -0.1dB/-3.8dB/-5.2dB
Digital jitter (48kHz / 96kHz)	14psec / 10psec
Resolution (re. -100dBFS / -110dBFS)	±0.1dB / ±0.3dB
Power consumption (Vega G2.1)	15W (14W standby)
Dimensions (WHD) / Weight	340x96x320mm / 9.5kg