

WiiM Amp

Industry 'disrupter' WiiM continues its campaign to shake up the audio scene with another comprehensively-equipped streamer, this time with a Class D amp on board
Review: **Mark Craven Lab: Paul Miller**

If I had a pound for every time I'd heard someone talking about WiiM in the last year I would easily be able to afford the £329 streaming amplifier auditioned here. Since its arrival in the UK in 2023, WiiM – the consumer-facing brand of California-based smart technology company Linkplay – has earned a reputation for compact, networked hi-fi products that combine wide feature sets and a forward-thinking control app, but at prices that would have seemed like science-fiction just a few years ago.

The WiiM Amp is one of five current models, and the only one with built-in amplification. The rest are all streamers of varying specification, from the WiiM Mini at an eye-opening £89 to the WiiM Ultra flagship, with touchscreen interface, for £349. In between are the outwardly identical £149 WiiM Pro and £219 WiiM Pro Plus [HFN Aug '24], and it's these that the WiiM Amp most closely resembles.

FLIPPING THE CHIPS

WiiM hasn't just bolted a Class D amp stage, rated at 2x60W/8ohm, onto one of its existing streaming DACs, however. The WiiM Amp, in its pursuit of 'just add speakers' glory, gets a more comprehensive roster of connections, including an HDMI ARC input for TV audio (although decoding is PCM only), a subwoofer output with 30Hz-250Hz crossover selection, and a USB-A port for local file playback.

Furthermore, the DAC chip employed (an ES9018K2M) is different to that of the WiiM Ultra, Pro and Pro Plus [see PM's Lab Report, p75]. The company seems to be agnostic as regards DAC suppliers, selecting chips that suit the needs and target price of the product at hand.

As well as those HDMI and USB ports, the WiiM Amp sports optical, Wi-Fi/Ethernet, Bluetooth and analogue line

RIGHT: Compact PCB, with Wi-Fi/BT daughter board [centre], is surrounded by switchmode PSUs [top and left/right] feeding TI Class D amp [bottom right] in addition to a PCM1861 ADC, ES9018K2M and PCM5121 DACs [centre right]

connections. Note that music played via the latter passes through an ADC, to enable the amp's DSP and EQ functions, but there's no bypass mode. Some might also have expected WiiM's do-it-all device to have a headphone output, but 'private listening' via the amplifier is through Bluetooth headphones only.

All this functionality is wrapped up in a chassis measuring 190x63x190mm (whd), which is available in either a silver or 'space grey' aluminium finish, with rounded edges and a prominent WiiM logo on the top plate. Like the rest of WiiM's hardware, with the exception of the puck-shaped, plastic WiiM Mini, it looks really rather smart. There's no front panel display, but a strip of small LEDs next to the

volume/function control on the amplifier's front panel signifies volume status.

SWEET HOME

Bundled with the amp are HDMI, optical, and RCA stereo cables, plus a Bluetooth remote [p75]. This needs to be paired with the amp before use, and I wouldn't be surprised if some owners never bother, as the best method of control by far is the WiiM Home app. This has a clean, modern presentation that makes some rivals'

efforts appear clunky, and is surprisingly rich in features. In fact, this software is arguably WiiM's calling card, and a key aspect of its products' appeal.

After setup over Wi-Fi (complete with an indication of the 'strength' of its

'I whooped to the "Rah-rah, Ga-Ga, ooh-la-la" chorus'



LEFT: Compact moulded plastic enclosure has no on/off button but does include a multifunction rotary for volume up/down, play/pause and Wi-Fi reset

through power-hungry loudspeakers. But its performance easily raises a smile, particularly in the crisp, detailed nature of its sound, and its lively demeanour. Paired with B&W 705 S3 Signature standmounts [HFN Aug '24] and some more price

commensurate Q Acoustics 3010i bookshelf speakers, it was mostly a pleasure to listen to, although the somewhat 'old school' nature of its Class D amplification was exposed on occasion. As an example, Great White's 'Rock Me' [Once Bitten; Capitol Records] at first sounded great, as the WiiM Amp teased out the hi-hat rhythms during its intro, and a delivered a good sense of texture and definition to the bassline. The bluesy guitar licks and Jack Russell's Robert Plant-style vocal also carried plenty of nuance, and when the kick drum came in, it had agreeable punch and speed. Yet after this song's build up, the band explode into full-on 1980s hard rock mode, and the detail and nuance the amp had been showing were lost amidst a more uniform sound.

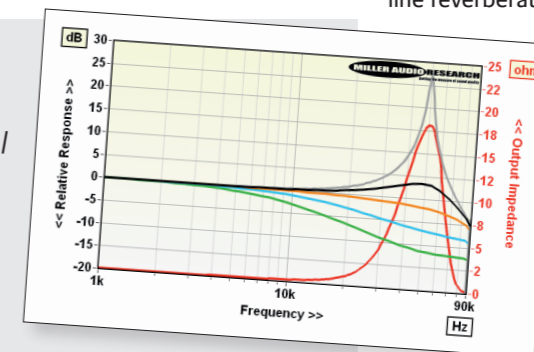
It was a similar story with Zeal & Ardor's 'Golden Liar' [Zeal & Ardor; MVKA Music]. This piece of avant-garde prog/metal mesmerised initially, with the looped guitar line reverberating into a wide space, joined by thumping floor toms and backing chants, and a gravelly spoken word intro that sounded suitably portentous. But the bassline didn't sound as deep and forceful as I've heard before, and as this piece segues into distorted guitars and blasting drums it really should become a huge wall of sound, something WiiM's Amp couldn't quite muster.

In short, there's an awful lot to play with in the WiiM Home app (you can even set an 'alarm clock' function so the amp plays from a specific source at a desired time), but it's mostly easy to get to grips with. There's no manual for the amp in the box, but you can download one from the company website. And here you'll also find a useful guide to everything its app can do.

LOOKING LIVELY
It should go without saying that WiiM's affordable streaming amplifier isn't exactly made for audiophile, critical listening

SYSTEM MATCHING

In practice, WiiM's choice of TI's PurePath Class D amplifier module [see Lab Report, p75] brings it closer to the likes of HiFi Rose's RS201 E streamer/amplifier [HFN Mar '22] than competitors using ICEpower's latest 'Edge' technology or anything from the self-oscillating Hypex/Purifi/Eigentakt platform [see p60]. As a result, the WiiM Amp retains some familiar foibles of 'traditional' analogue Class D amplifiers where the module's inductive output filter [screened coils, lower right of inside shot, p72] causes a rise in output impedance at high frequencies, lifting from a 'flat' 0.064ohm (20Hz-1kHz) to 0.43ohm/10kHz, 1.7ohm/20kHz and 28ohm/50kHz [red trace, inset Graph]. This means changes in loudspeaker load impact both distortion and response. Unloaded, with a 192kHz digital input, the Amp has a significant resonance/response peak of +28dB/50kHz [grey trace, inset Graph]. Into 8ohm [black trace] it rises to +0.9dB/20kHz before peaking at +3.4dB/48kHz, but rolls away into 4ohm to -0.5dB/20kHz [orange] before drooping further to -3.1dB/20kHz into 2ohm [blue] and -6.8dB/20kHz into 1ohm [green]. So the high treble 'character' of the WiiM Amp may also depend on your choice of partnering loudspeaker. PM



While some tracks pushed this budget amplifier out of its comfort zone, with others it just seemed to sail right through. A rendition of 'Strasbourg/St Denis', by the Roy Hargrove Quintet [Earfood, EmArcy; 96kHz/24-bit], mixed a rich, opulent feel to the lower octaves with brass elements that ranged from raspy and attacking to smooth, while a staccato piano solo

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ABOVE: With BT and Wi-Fi antennas concealed inside the enclosure, the Wiim Amp offers a wired Ethernet port, HDMI ARC, USB-A, optical (192kHz/24-bit) and line inputs (on RCAs) with a sub out (on RCA) and 4mm speaker cable binding posts

brought yet another texture to the mix. The amp also deftly marshalled the midrange character during 'Shallow', from the *A Star Is Born* remake [Interscope; 48kHz/24-bit], picking out the lilting acoustic guitar beneath the dual vocal flavours of Bradley Cooper and Lady Gaga.

MONSTER BEATS

The latter's solo single 'Bad Romance' [*The Fame Monster*; Streamline Records] was even more in the Wiim Amp's wheelhouse, being poppy, upbeat and less dynamically challenging. It was impossible to not tap my foot and whoop along to the 'Rah-rah, Ga-Ga, ooh-la-la' chorus, while enjoying a solid stereo image peppered with digital effects and synths. Nik Kershaw's 'Dancing Girls' [*Human Racing*; MCA] is of a similar bent and found the Wiim Amp really getting into its stride, slamming into the electronic percussion and keeping pace with its frantic rhythms.

'The Call', from Dario Marianelli's score for disaster movie *Everest* [Varese Sarabande] seeks to emphasise the awe-inspiring nature of the landscape, and the danger in the expedition, through choral chants and long, slow string and woodwind notes. It's uncomplicated stuff, but sounded

LEFT: Wiim's Bluetooth voice remote covers off the essential functions including power/standby, input, mute, volume and track skip, play and pause



stirring here, thanks to the amp's clear and precise presentation.

While listening to this I played with the preset EQs on the Wiim Home app. There are more than 20 options, which is quite clearly overkill, but all bring an immediately different sound signature. Call me controversial, but I found some of these settings beneficial, particularly in adding some extra presence to the bottom end. Those who are prepared to cycle through DAC filters (of which there are none here) might therefore fancy shuffling through Wiim's EQs. But do stay well clear of the 'Bass Reducer', which introduces cuts from 500Hz and sounds a bit... weird.

For the audiophile looking for a streaming bargain, Wiim's Pro Plus is the obvious candidate, giving you the brand's exemplary app and a more technically gifted DAC stage to go with the amplification of your choice. The appeal of the Wiim Amp, on the other hand, lies in its all-in-one nature, and given its form factor it could even be used in a desktop set-up. Manage your expectations of what it might do, and you'll be surprised by what it can. ⚡

HI-FI NEWS VERDICT

Packing functionality that makes a mockery of its price tag, and controlled by arguably one of the most seamless and versatile apps in the business, this little streaming amplifier from Wiim is a real hi-fi bargain. Yes, much of its appeal lies in the ease of use and source/settings flexibility, but the performance is more than fine for the money too. For a 'second' system or budget build, it has to be on your shortlist.

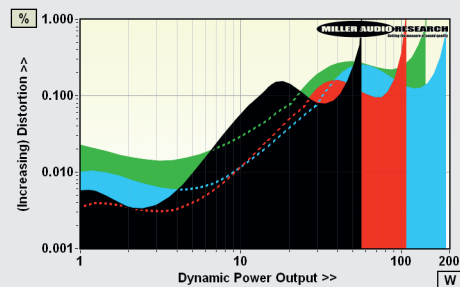
Sound Quality: 85%
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LAB REPORT

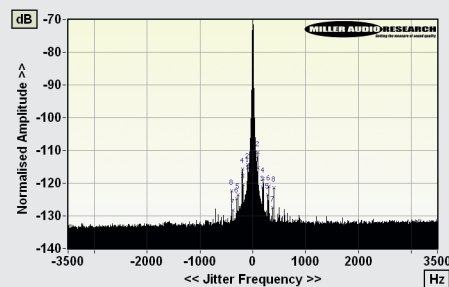
WIIM AMP

To an extent, the 'Amp' is a Wiim Pro Plus network-attached streamer/preamp [*HFN* Aug '24] with a TI TPA3255 Class D power module attached. However, while both employ a TI PCM1861 ADC for the line input, the Pro Plus uses an AKM AK4493SEQ DAC and the Wiim Amp an ES9018K2M DAC by way of alternative. There's also a PCM5121 DAC onboard but this looks to be driving the user-configurable subwoofer output. Moreover, while Wiim has chosen a linear phase digital filter offering 83dB stopband rejection (44.1/48kHz data), it has less impact on the overall frequency response than the uncompensated (reactive) LPF at the output of the amplifier [see boxout, p73]. And power? TI rates the TPA3255 at '2x150W/8ohm in BTL configuration' while Wiim specifies 60W/8ohm, doubling to 120W/4ohm. In practice, it meets this at 64W and 125W into 8/4ohm while, in common with some other Class D amps, headroom is slightly *negative* with outputs of 59W, 110W, 194W and 135W under dynamic conditions into 8, 4, 2 and 1ohm, respectively [see Graph 1].

The direct optical, HDMI and Ethernet inputs yield superior results over the analogue line input, bypassing the ADC. For example, at 1W/8ohm distortion is 0.005-0.10% but falls still further to 0.00045-0.013% via the digital ins. Noise is lower too via the direct digital ins, achieving an A-wtd S/N ratio of 98dB vs. a still above-average 88dB from the line input (all re. 0dBW). As all inputs are digitally processed and then converted back to analogue prior to the TPA3255 amp, there's ample opportunity for low-rate jitter/phase noise to creep in [see Graph 2]. However, correlated jitter at 480psec is really very well controlled indeed bearing in mind the cost/compactness of this busy little box. PM



ABOVE: Dynamic power output versus distortion into 8ohm (black trace), 4ohm (red), 2ohm (blue) and 1ohm (green) speaker loads. Maximum current is 9.8A



ABOVE: Digital jitter re. 48kHz/24-bit data via Class D output stage at 1W/8ohm. Note spectral broadening

HI-FI NEWS SPECIFICATIONS

Power output (<1% THD, 8/4ohm)	64W / 125W
Dynamic power (<1% THD, 8/4/2/1ohm)	59W / 110W / 194W / 135W
Output impedance (20Hz-20kHz)	0.064-1.74ohm
Freq. resp. (20Hz-20kHz/45kHz/90kHz)	-0.3dB to +0.7dB/+2.4dB/-5.3dB
Digital jitter (Optical)	480psec
A-wtd S/N ratio (re. 0dBW: Line/Opt)	88.3dB / 97.7dB
Dist. (20Hz-20kHz re. 1W; Line/Opt)	0.005-0.10% / 0.00045-0.013%
Power consumption (Idle/rated o/p)	11W / 143W (1W standby)
Dimensions (WHD) / Weight	190x63x190mm / 1.8kg