

Aqua La Scala MKII Optologic DAC Review

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Craig Joyce samples this esoteric new high-end digital-to-analogue convertor...

Aqua Acoustic

La Scala MKII Optologic DAC

£7,460 RRP



A recent entrant to the high-end DAC and network streaming space is the Italian outfit Aqua Technologies, led by Cristian Anelli and based in Milan. Utilising a proprietary FPGA-based digital decoder, and unusually combining a resistor ladder DAC and a tube-based analogue output stage, the La Scala Mkii Optologic DAC has a bespoke architecture that distinguishes itself from the crowds of ESS or AKM IC-based DACs on the market. With a total absence of digital filtering in the product, Aqua has attempted to forge its own path to delivering an accurate music reproduction experience. While a brave approach, does the result meet these lofty goals?

UP CLOSE

As a high-end audio equipment manufacturer, Aqua produces a focused product suite of DACs, network streamers and CD transports. Within the DAC line, the top of the range is represented by the Formula, followed by the La Scala and the La Voce. Unique to the La Scala is an analogue stage that utilises a valve/MOSFET direct coupling stage in a pure Class A configuration.

The La Scala DAC is housed in an inoffensive chassis, with a brushed fascia adorned with a pair of rotary switches for power and input selection and a phase toggle switch. There is little in the way of visual feedback on the device, but the ability to see the tubes in operation through a portal on the

front is a nice touch. Outputs are RCA or XLR, with a true balanced analogue and fully floating output stage that Aqua says reduces the impact of second harmonic distortion and ground noise.



With S/PDIF inputs over BNC and RCA, alongside a balanced AES/EBU input and the ubiquitous USB input, a buyer of this DAC would be hard-pressed to seek more input functionality. This is a DAC first and foremost, operating *sans* network transport or streaming inputs, although Aqua does offer a proprietary RJ45-based AQLink with an I2S interface to its other product lines.

This offers a connection between the chained devices that's as direct as possible, and said to be free from jitter and noise problems while allowing a very high data transmission speed. The S/PDIF and AES inputs offer 24-bit, 192 kHz playback, while USB supports 24-bit, 384 kHz PCM and DSD64 or DSD128 via DSD over PCM (DoP). The USB port is galvanically isolated from noise from a connecting computer, and asynchronous in nature relying upon the clock in the DAC. No remote control is supplied.

Aqua DACs eschew mainstream DAC topologies based on integrated circuit DACs from manufacturers like ESS, AKM and Analog Devices, and instead use non-oversampling R2R (resistor) ladder conversion technology. The precision R2R ladder network is galvanically and magnetically isolated from the decoding FPGA by way of opto-couplers which provide the 'Optologic' suffix to the product name. The company says that this creates complete isolation of all digital circuitry, including the clock, from the analogue section, delivering a clean, noiseless ground plan. Cristian from Aqua adds: "This approach is critical in the differential management of the R2R ladders, achieving perfect symmetry between the counter-phase halves. The result is the highest tonal contrast and naturalness."

Unusually and controversially, the La Scala performs no digital filtering of the signal. Original digital samples are directly translated to the reproduced sound, claimed by Aqua to preserve the transient shape and avoid any ringing. In this design, the company is seemingly chasing a purist analogue sound from digital audio.

Aqua has developed a single-stage signal amplifier that uses ECC81 tubes – a high-frequency triode – for its low noise characteristics. This is directly connected to the high voltage MOSFET stage to offer an asserted wide bandwidth performance with a fast response, low distortion and lower output impedance compared to conventional approaches. While the La Scala uses ECC81 tubes, its specially unstressed circuit gives a useful life of approximately 10,000 hours, the company says. While it's certainly possible to experiment with different tubes, Aqua believes that the ones provided are currently the optimal solution.



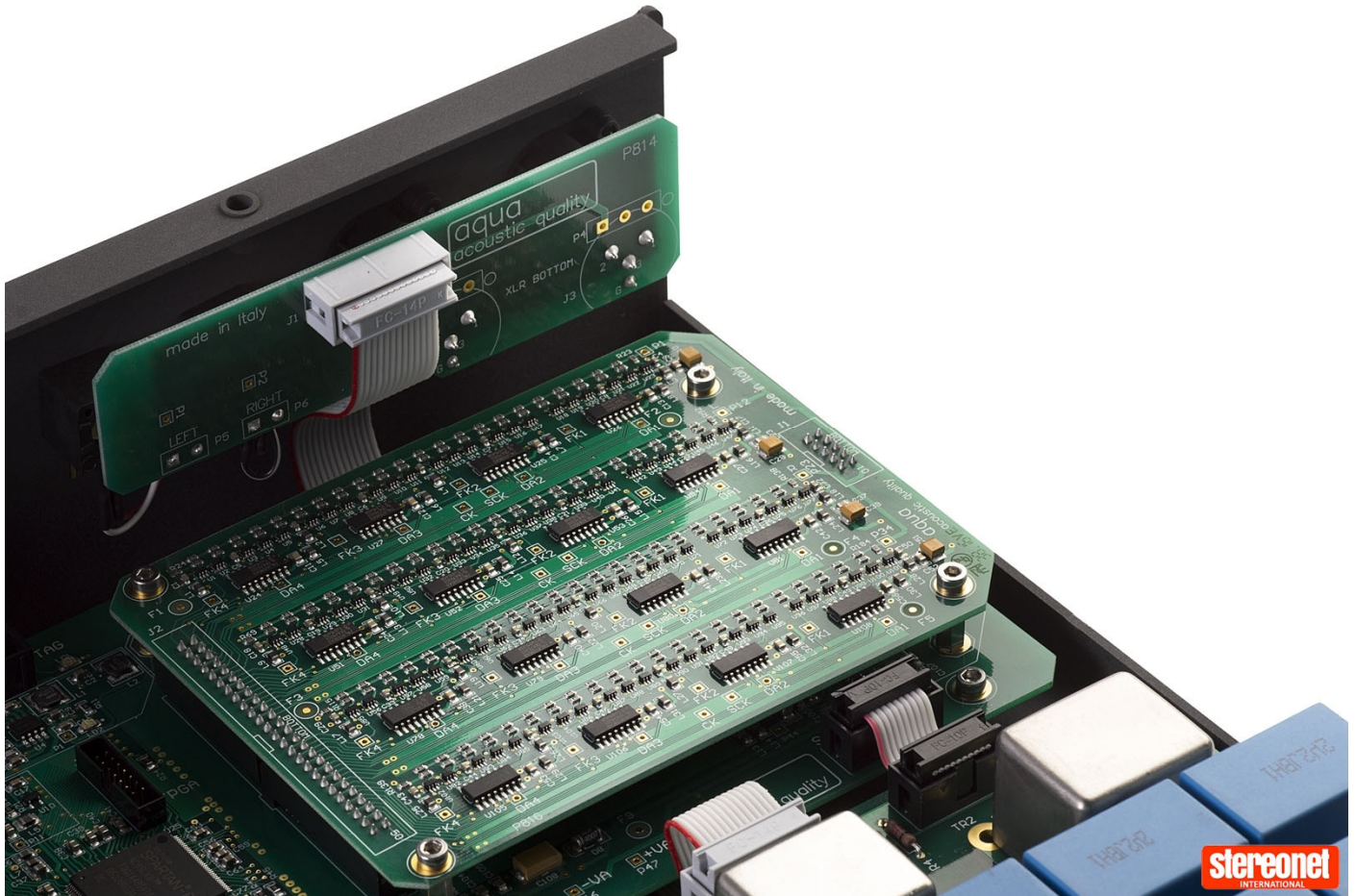
Special long life, double metallised film pulse capacitors are used, along with low noise metal foil precision resistors, ultra fast diodes and halogen-free cables. Being an R2R DAC, the heart of the conversion circuit is composed of a resistor ladder network. For this reason, Aqua carefully selects resistors of the “best possible quality” because “their precision and noise performance impact directly on the final result.”

Also unusual amongst DACs is the flexibility and modularity of the La Scala, an important facet of the company's design philosophy. Each circuit is subdivided into modules, each of which is easily replaceable. Such an approach facilitates an upgrade path within the same chassis, allowing users to protect their investment and maintain it with simple upgrades.

For this review, I sourced a USB-centric high-definition audio stream over Qobuz through Roon via a Mac Mini. Playback was through a pair of mastering-grade Barefoot MicroMain 27 active studio monitors in a near-field configuration. I gave the DAC about a week's burn-in before I was ready to listen in earnest.

THE LISTENING

The La Scala DAC is an adept performer, bringing out a fantastic tonality that draws a clear line through the timbre of the source materials. There is no shortage of soundstage depth or width, and it excels in fine detail retrieval and handling complex content. While perhaps not as obvious in bass presentation as other DACs across my review bench, this one more than makes up for this with high-frequency performance and tracks dripping in reverb, delivering a soundstage that is enveloping and enticing.



The Eternal from **Joy Division's** final album *Closer* has always been an interesting and distinctive listen. The synthetic white noise effects test the width of a soundstage, while the piano and bass alongside **Ian Curtis'** plaintive vocals tether the stereo image like a rock. On the La Scala DAC, the ethereal nature of this song was strongly evoked, and the experimental nature of the recording and mixing process was laid bare for the listener to explore.

The latest **Arab Strap** album *As Days Get Dark* is a finely mixed and prepared record that offers many layers of examination in the right system. *Kebabylon* is a great case in point, and the La Scala DAC delivered here – providing a superb vantage point into the various production aspects. Percussion was spread wide across the soundstage, and the insistent sampled bass and cymbals were punctured by horns and synth stabs that the casual observer would miss.

The long-departed **Mark Linkous** from **Sparklehorse's** one-off album with **Dangermouse**, *Dark Night Of The Soul*, features a patchwork quilt of collaborators. *Jaykub* featuring **Jason Lyttle** from **Grandaddy** is a great example of computer-centric production. The La Scala DAC aptly drew out acoustic guitars and vocals. Even more impressive was its ability to cleanly articulate the complex sampled layers that weave in and out of this song without it making the listener feel seasick.

On a much more acoustic-sounding tip, *Glossalalia* by **Vic Chesnutt** is a thoroughly pretty listen. His distinctive style is supported by finely rendered acoustic guitar and strings, a sparse arrangement that the La Scala DAC imparted well. It was happy to present the emotion in all its fullness, impassively sitting by while the song builds to a crescendo of strings. It gave a wonderful window into how this would have sounded, live in the room.

Blackout from the latest, superlative **Turnstile** record *Glow On*, is an exceptionally well-produced piece of East Coast American punk. The La Scala DAC gave the guitars ample space to tear across the soundstage, with **Brendan Yates'** singing losing none of the immediacies from its live context. Well-lit special, synthetic effects – layered to bring interest to the song and to signal dynamic shifts – were brought out for those listening closely. However, it was the dynamics that really hit me when the track was played at higher volumes.



THE VERDICT



Starting with a blank sheet of paper when designing a totally new DAC architecture is no mean feat. While not a household name, it is clear that the Aqua Acoustics team knows a thing or two about digital audio, and the reproduction of music too. Putting the La Scala through its paces using a wide variety of source materials over the past month has been a highly pleasing experience. While not offering all of the features that some competitors do, the focused approach to the sonic outcome is to be lauded. This DAC offers all of the benefits of a resistor ladder design – namely accuracy, a lovely rounded bass and limited harshness – then adds in some tube-type warmth and a well-designed output stage to deliver a stellar sound.



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With an engineering degree in digital signal processing and a storied career in IT networking and cyber security, Craig loves to push the boundaries of audio technologies. An aficionado of live music with personal detours in music production and event promotion, Craig is a long time enthusiast of post punk, electronic and experimental music.

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