

dCS Lina Network DAC Review

By Marcus | September 19, 2022



DCS LINA NETWORK DAC REVIEW

The dCS Lina Network DAC is an outstandingly detailed and natural-sounding decoder with a ton of useful features and a very modern supporting app bringing the best of the internet and network right to your fingertips.

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PROS

- + Incredibly resolving DAC
- + Wide Range of Voltage output levels
- + Excellent integration with dCS Mosaic

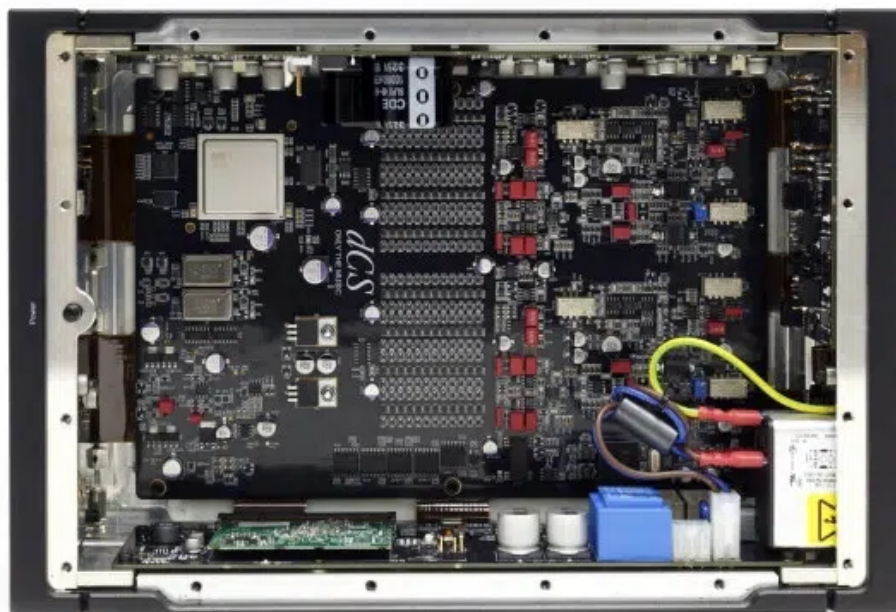
CONS

- i2S
- No out of the box wireless

9.3

Reader's Score

Hot after our dCS Lina Headphone Amplifier review last month we now have what many consider to be the heartbeat of this high-end modular stack, the Lina Network DAC. Coming in at £11750 it's not for the faint of heart budget-wise but is a little cheaper than the amp-free Bartok DAC version in terms of pricing. There is also some overlap on paper with the Bartok including a very familiar in-house DAC design and OS layer. There is also a similar level of remote integration using dCS's excellent Mosaic app. Like the Bartok, this is not just a standard desktop DAC either. The Lina Network DAC offers LAN enthusiasts the ability to stream using a wide range of services. Perhaps significantly, it is compatible with the new Lina Master Clock which is as game-changing for me as the Hugo M Scaler was for the performance of the Chord TT2.

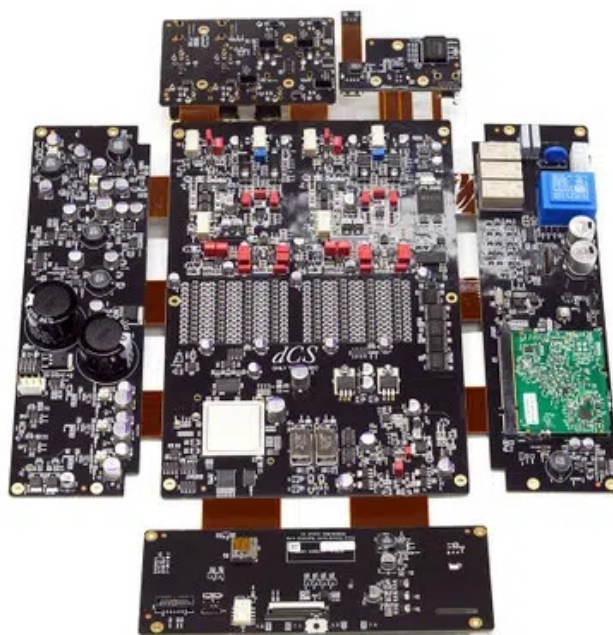


Tech Highlights Ring DAC

It is probably no surprise that the Lina Network DAC uses the company's in-house and highly-rated Ring DAC implementation. Every single digital conversion system dCS has in the market right now uses one version or another of this design. dCS does not use off-the-shelf delta-sigma DAC blocks or chipsets such as Sabre, AKM, or Cirrus Logic. Rather, they use a network of FPGAs (Field Programmable Gate Arrays) preloaded to execute dCS proprietary software that does all the digital filtering and digital-to-analog conversion. For those coming from the likes of Chord, or perhaps even ladder-based frameworks such as R2R, the proposition here is relatively similar at a high level with its resistor and match-based mechanism. However, where it differs in managing its current source is via dCS's 'thermometer coded' DAC architecture. This design effectively decorrelates errors from the audio signal via a mapper (mathematical rules) pattern and converts them into white noise thus effectively reducing distortion to a very low level.

Differentiation

Since our Bartok reviews the Ring DAC has had an upgrade with the new hardware modified APEX version launched on their summit units such as the Rossini earlier this year, and the Bartok itself getting a software "2.0" upgrade on its mapper. The primary difference between 2.0 and the original is in how the data is presented for conversion with the 2.0 version set at 5.644 or 6.14MHz and the Lina Network DAC version, or Map 2 in the Bartok set at a lower 2.822 or 3.07MHz. As far as I am aware, the Lina Network DAC uses the original Ring DAC configuration with the Mapper V1.0 rather than the Bartok 2.0 firmware. Perhaps this is a more significant way of differentiating between the two DAC implementations and shifting the more expensive Bartok to a slightly higher plane. The second point of differentiation is the physical implementation. The



Lina Network DAC housing is far narrower than the Bartok yet it must accommodate essentially the same board. To that end, dCS essentially folded the board with key components on the sides of the housing with ribbon connectors rather than a more spatially demanding original flat design.

Decoding

Obsolescence planned or otherwise is a moot point with the Lina Network DAC's firmware upgradeability. That may also be a relief to those scratching their head at the decoding specifications also because like the original Bartok this configuration has somewhat of a low ceiling for decoding. The Lina Network DAC top-level decoding rate, (USB), is set at 32BIT/384kHz PCM with a native capability of a maximum of DSD128 including DSDX2 upsampling. So, no native DSD256/512 or PCM 768kHz though, like the Bartok, you do get native rendering and unfolding of MQA which plenty of audiophiles will welcome. The Lina Network DAC will also accept digital signals via AES at up to 32BIT/384kHz, coaxial to 192k, and optical to its maximum 96k rate. Analog output is a user-selectable variable line out at 0.2, 0.6, and 2V or a more excitable 6V depending on your preferences. I remember speaking to dCS in the original Bartok testing process on why the lack of DSD512 and they mentioned that it came down to commercial demand with DSD512 usage levels too low to justify the development currently. However, since the Ring DAC is upgradeable then if the demand is there, dCS can bring in DSD256 and beyond.

Network Streaming

Aside from the classics and something dCS is a big supporter of is network-based streaming capability, hence the name, Lina Network DAC. Like the Bartok, the Lina will accept an incoming signal via an RJ45 port, (ethernet) opening up a wide range of services either locally, (UPnP or NAS), or via the internet, through media servers such as Roon, for which the Lina Network DAC is Roon Ready. It can also directly interface your TIDAL, Qobuz, or Spotify Connect services as well as take advantage of any Apple Airplay system you happen to be running. Importantly, the Lina Network DAC's firmware can be upgraded via dCS Mosaic as well as the software acting as that all-important remote control for media serving or device settings saving you the bother of physical exercise. Lovely.

Master Clock Connectivity

Last but not least, is the ability for the Lina Network DAC to integrate with the new Lina Master Clock. dCS has pitched this as optional and of course, you do not need to buy it. However, as you will see in our review, it is very hard to ignore it and what it can do, especially in relation to the performance of the DAC. Essentially, the Master Clock hammers down on jitter, (and distortion), via dual crystal oscillators on the incoming digital signal before sending it onto the DAC for conversion to its analog form. More than, when connected, its effect on the quality of the output sound is, in my opinion, quite transformative. It is not subtle, nuanced, or anything of that nature but immediately noticeable.



Design / Aesthetics

It is no surprise that the Lina Network DAC takes on the exact same classy design language as the Lina headphone amplifier which is no surprise since they are part of a triple modular system designed to neatly stack or sit side by side. That means a relatively narrow but deep body, with a discreet or minimalistic 'shoe box' form factor and the same robust machined aluminum chassis as the amplifier. Only this time, the front panel is a rather reflective glass panel finish than the matte minimalism of the matching amplifier. Housed in the middle is the all-important LCD display which is a bit bigger and more legible from wider angles than the narrower Bartok interface. All I/O is housed on the rear panel in a very clean and well-organized fashion and the power-up button is in the same discreet position as the amplifier's equivalent, just under the front panel. The stabilizing system underneath is the same attractive design as the amplifier creating an illusion of separation between all 3 units when stacked, (or the rack floor if singular). Instead of flat feet or the traditional pillar stabilizer design, it is a curved long body design with the feet discreetly positioned at each internal corner. It keeps everything very steady and at the same time keeps the smooth design floor completely uninterrupted.

Stacking or Not?

The weight difference is minimal between the DAC and the amp with the Lina Network DAC weighing in at 7.4kg compared to the amplifier's 7.5kg. Both have some heft but on their own, they are no match for the 16+ kilo Bartok. Together, they are meaty, and whilst they look awesome stacked I would have some reservations on the type of rack you need with such high downward pressure on a narrow surface area. My personal take is they seem more comfortable when aligned side by side rather than on top of each other.

I/O

Everything outside of I²S is pretty much available on the backend of the Lina Network DAC. You get both balanced 3-pin XLR and unbalanced dual RCA analog outputs and a wide range of digital inputs. You get no less than 3 SPDIF ports including coaxial, BNC, and optical, 2 AES, USB-B, and USB-A ports, and the dual BNC at the base specifically to connect to the Lina Master Clock. At the very far right a single RJ45 input for network-based streaming and another dual RJ45 socket at the bottom left for the Power Link system. One small tip, and purely optional is you can slap a travel router on the end of that RJ45 and hook it up in client mode to turn the Lina Network DAC into a wireless receiver. For around \$50 a good TP-Link travel hub will do that for you if it is compatible and if your modem is too far away or lacks a spare RJ45 output.



Aesthetically I do have to say also the spacing and finishing on the back of the Lina Network DAC are fantastic. Quite often, modular back panels can be cramped or messy in their organization making cable management a bit of pain. Not so with the Lina Network DAC interface. It's as clean as a whistle, beautifully gold-plated where it is needed, and with very clear labeling.

Controls

Because it is a DAC there is a bit more to control here and for those coming from the Bartok, there will be a high degree of familiarity with that manual control system. However, this time, dCS has opted for a more discreet touch-based system compared to the older Bartok mechanical button array. I presume removing the physical articulation will lengthen the functional lifespan of the buttons themselves if you intend to keep this system around for a long time. I must point out that by touchscreen I mean the 4 lights you see in the above picture are touch sensitive allowing you to navigate in a linear manner through the options presented on the screen rather than the entire screen itself. There is only one such physical button which is the same power-up switch as the Lina Headphone Amplifier situated on the underside of the front panel and you are only going to press that once or twice a session.



Navigation

Instead of labels you now have icons above each touch-sensitive button. As an old UI consultant, I do have apprehensions about using icons over text labels, they are never as immediately intuitive both in terms of action recognition and anticipatory workflow. However, dCS seems to have limited the navigational path of the Lina Network DAC touchscreen operation to keep it relatively simple and quick to learn. The OS itself is not hugely different either from the Bartok in terms of category options. The navigational drill down seems to be only 2 deep with sub-menus on the second layer presenting no more than 4-5 options which you can cycle through without bringing up any additional screens. Left-to-right navigation is also fairly minimal. One of the negative points from the Bartok system is gone also. If you linger too long on a Bartok menu feature it defaults back to the main screen meaning you have to navigate back if you have not completed any changes. With the Lina Network DAC OS, it stays there until you decide to go back out which feels much less hurried.

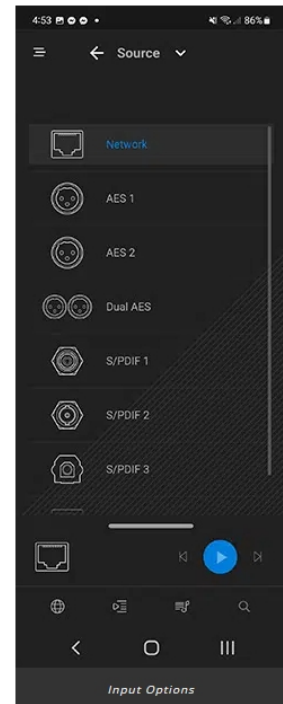
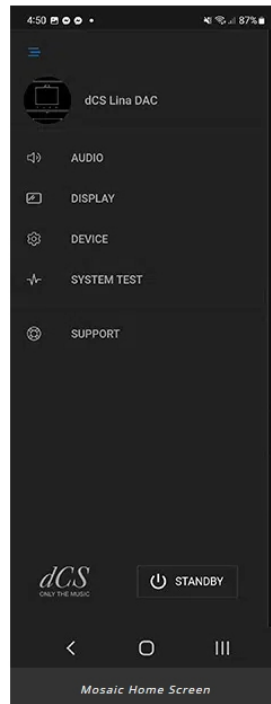


Options

And what options do you exactly have? Quite a lot actually. Features include source switching, Master Clock enabling, AES controls, line-out voltage levels, and even a test signal feature. You also have plenty of sound shaping options. Everything from a range of PCM and DSD filters, upsampling in DSD/DXD mode as well as a very effective Crossfeed option, one you are likely to want to use. You also have a USB Audio Class selector which is fairly unique since most DACs do not bother with differentiating between the two classes. Typically, modern DACs are set at USB Class 2 which maximizes the potential sample rates up to DSD128 and 384kS/s. However, the Lina Network DAC can connect to older legacy devices for Class 1 handshakes which peak at 96kS/s. This OS also offers a buffer switch. This reduces the default inherent data buffer delay the DAC uses to detect changes in sample rates and clocking adjustments in audio. Why reduce this useful delay? Usually for video and media purposes such as watching movies on your PC or TV. Without it, the Lina will show some audible, (and visual,) sync lag on media. Finally, the four icons on the home screen are also quick access options including a source selector and a crossfeed activator with a secondary crossfeed mode selector, (3rd icon). The final one to the far right is your drill-down main menu system for deeper levels of configuration.

dCS Mosaic

I consider the Mosaic app a must-have for the Bartok over the last few years and so also now for the Lina Network DAC. It is available for both Android and iOS users alike but both the device and the Lina Network DAC must be on the same network to detect each other. It gives you everything I listed above in one handy remote-control-like system on your phone or tablet as well as direct access to streaming services such as TIDAL and Qobuz and the ability to upgrade the firmware on the DAC as and when required. The interface is very clean and easy to understand. In fact, I would argue using the app will give you a much faster 'education' on what you can do in terms of options for the Lina Network DAC than the manual finger tapping at the actual unit screen itself. Also, the reaction time of the Lina Network DAC to your selection via Mosaic is very fast, with almost no lag at all on my network for a number of weeks now



Packaging & Accessories

There is not a huge amount to add here in terms of packaging over the Lina Headphone amplifier experience because it is almost the exact same excellent unboxing experience. You can read up in more detail on what comes packed in here. What I do want to add is the slightly stronger accessory line-up over what came with the amplifier including a set of balanced 3-pin XLR cables which ideally I would have liked to have also seen included in the amplifier package. For the price, I do think the addition of a USB cable would not have gone amiss either with the Lina Network DAC accessory line-up. Finally, you also get a wonderfully leathery smelly pouch that contains the user manual and some collateral on the dCS community as well as Spotify Premium.



Sound Impressions

All impressions below were completed using the Lina Headphone amplifier combined with the Abyss Diana TC, Audeze's LCD-5, and the HIFIMAN Susvara. For some specific aspects, the Lina Master Clock was also included.

Summary

The Lina Network DAC is a high-energy, articulate performer with world-class levels of resolution and excellent dynamic range to go along with it. It brings in very little in the way of coloration but if I had to make a snap judgment I would say it's generally neutral to natural sounding and not as warm or as dense as Bartok's equivalent DAC tuning. Where I find it more immediate is the level of drive or 'PRAT' it injects into paired amplifier performances with demanding headphones such as the Diana TC. The punch and dynamic snap from the Lina Network DAC are both vivid and incisive. Nothing mushy or bloated at all to any amp pairing I tried it with. The Lina Network DAC is the perfect partner to the Class AB Lina headphone amplifier allowing that excellent and strong dynamic low-end to come out so clearly whilst at the same time keeping the layering and

decay under tight control. Even more so with the Master Clock integrated and turned on which stretches the staging even deeper and taller whilst at the same time adding a whole new dimension of holographic complexity to instrumental and vocal imaging. With its massive 6V output capability it has the guts to drive matching amplifiers and demanding planar headphones with aplomb. At the same time, dropping the voltage to incredibly low 0.2V and 0.6V ranges will bring in very low noise floors for quality amps to work just fine with more sensitive headphones and IEMs. I actually found the Lina Network DAC 2V output setting to be the most refined and even-handed setting if you are a vocal lover or enjoy more intimate and delicate recordings with headphones. The harmonic balance is a little more accurate than the 6V equivalent.

Timbre

I honestly cannot find any fault with the timbral balance of the Lina Network DAC. Any overt coloration bias you are going to hear is going to come from your amplifier and of course the headphone of choice. Of course, this is going to come down to personal preferences but for me, the harmonic balance is almost perfect for my tastes with a neutral to slightly natural tone to both instrumental and vocal timbre. Where you might find bias is just how strong the fundamental becomes when combined with the Master Clock which seems to amplify the sub-bass presence and veracity of the mid-bass punch a bit more than the DAC alone. The other slight variation in the timbral quality is the switch from 2V to 6V output where aspects of percussion timbre take on a slightly stronger upper harmonic presence inviting higher levels of detectable contrast into the texture. I call this a more excitable tone and it does present itself as sounding quite bombastic whereas the more sedate 2V sounds calmer, more refined, and treats delicate vocal passages with more deference. One other clear aspect of timbral variation is the use of the Crossfeed filter, particularly with clean-sounding and expansive headphones such as the HD800. Without the HD800 is feisty and clean sounding with more upper-mids and lower treble presence and a bit of sparkle on top. With the Crossfeed applied the resulting tone is more liquid-like in its delivery, calmer, and slightly warmer sounding. It is less aggressive in its delivery with the imaging out in front rather than far left and right or 'down each ear' which can fatigue when paired with a bright-sounding amplifier.

Staging

The Lina Network DAC pushes out the presentation in all directions creating a very wide and deep quality with vocals slightly to the fore but also with a very nuanced softening of the treble presence. This keeps the headroom very tall but without pushing the sparkle too hard and upsetting the general harmonic balance



which can often pull your ear to one aspect of a performance over another. Note decay does seem to be slightly short, well at least with the Lina Headphone amplifier but this seems to be a bonus in allowing detail to come through quickly without any dreaded smear. It does help a lot with micro-detail retrieval that the background is incredibly black allowing very slight far flung spatial cues to image beautifully. Combined with the Lina Headphone amplifier and a headphone able to keep up with this pairing, the dynamic range is just spectacular. And it is not just the drama of a loud note hitting your ears in a lighting-like fashion but also the quieter moments that be quite breathtaking with the Lina Network DAC.

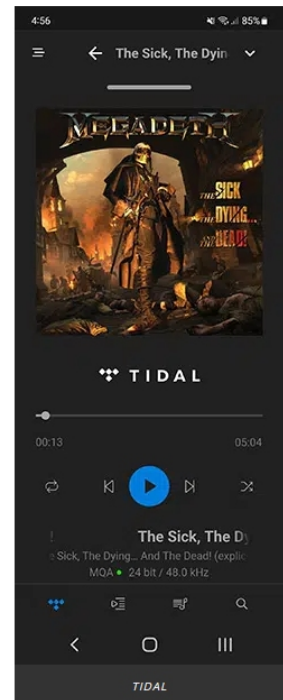
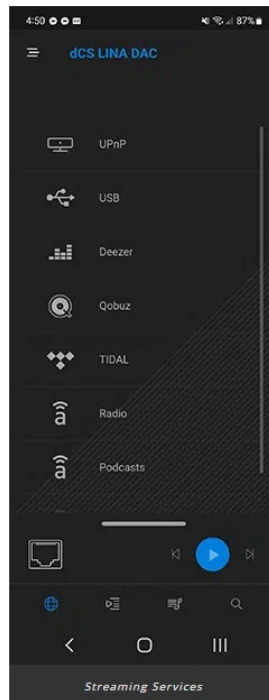
Delicate Dynamics

For example, Knut Reiersrud & Iver Kleive's *Min død er meg til gode* from the 30 Years' Fidelity compilation has this very soft and delicate opening sequence but is delivered within a very large hall-like acoustical environment. It keeps a slow but steady 81 BPM rhythm with plenty of space to allow the mix of background harpsichord and guitar plucking to sound wonderfully defined and articulate. The imaging during this sequence with the Lina Network DAC combined with the Lina

amplifier and the Diana TC is both immersive but delicately delivered at the same time. Then, 3 minutes into a very soothing track those church organics kick in demonstrating the dynamic range of the setup wonderfully. You get a tremendous sense of space, not just out wide but three-dimensional space in terms of height and depth also. The stage sounds huge but at the same time quite connected and life-like.

Streaming Performance / Services

There are a number of methods to establish a connection for streaming services with the Lina Network DAC. All of them start with an Ethernet or RJ45-based connection so, technically you could argue it is wired based though if you have something like a portable travel router you can also convert the Lina to receive a WiFi signal for lossless audio transmission. If your plan is to use the Lina Network DAC for video-based media you do need to switch the buffer option off in the main unit settings menu or else you will get a bit of lag for audio sync. The buffer control is primarily for audio or music to reduce any audible clicks when there is a change in the bitrate. Whilst you can establish a direct UPnP connection with the Lina Network DAC using the RJ45 input you can expand the level of streaming integration via the Mosaic App which is available for both Android and iOS users.



External Streaming

The Mosaic app integrated streaming services have not really changed that much since we reviewed the Bartok in 2020. You still get TIDAL, Qobuz, Spotify, and Deezer but new key players such as Amazon Music HD or Apple Music are still missing. The excellent Podcast and Internet Radio services are still there and whilst the audio stream quality will drop to lossy via the Lina Network DAC the range of available channels and topics is excellent. TIDAL, Qobuz, and Spotify users are directly integrated into Mosaic meaning you only need to enter your username and password to gain direct access to their respective libraries. The Lina Network DAC will also display all the relevant streaming information from each service including streaming source, (TIDAL, Qobuz, etc.), format, (e.g., MQA), bitrate, artist, and title. Given its larger screen size compared to the Bartok it also makes a better fist of organizing that information in a very legible manner.

Spotify

The level of integration and complexity of each service inside dCS Mosaic does differ though with Spotify a little on the clunky side compared to 3rd Party apps which have a more seamless level of integration. You can resume Spotify playback inside the Mosaic framework but for browsing and selecting it pushes you to open up the Spotify app before allowing you to dive back into Mosaic once playback resumes.

TIDAL

TIDAL on the Lina Network DAC is superior via Mosaic, both in terms of audio quality with full MQA compatibility as well as in-app integration including volume control. You do get a fair boost in dynamic range performance making Spotify Premium playback sound compressed and boring on the Bartok. It is not a complete home win. You do not get the full TIDAL app experience and it is much more list-based for navigation but it does highlight the key areas such as Masters and Rising which makes finding the quality MQA files a lot easier.

UPnP/DLNA

Once connected your DLNA or network-based UPnP services come alive offering a very hassle-free integration with the Lina Network DAC using Roon, (RoonReady), and Foobar2000, (UPnP option). There is no requirement for an external internet-based connection for this to work either so, effectively you can create a dedicated or secure network for local media separate from your more security-sensitive internet

connection. However, if you want the complete experience including TIDAL and Qobuz integration with Roon or any 3rd Party service such as BubbleUPnP you will need an outward-looking Network service with net connectivity. How effective the service is will depend entirely on the quality of your modem. For our modem here which is a bit of an old one, I had no issues streaming up to 24BIT/96k via TIDAL and up to 192K and DSD64 with Roon using our local media library. Beyond that, using DSD128 our modem stutters with congestion since it is a shared modem service among a number of users. That's not the fault of the Lina Network DAC but rather a limitation on our own network service capability.



Synergy / Master Clock Upgrade

Granted the Lina Master Clock is optional and will add to your overall costs when investing in the Lina system but I find it indispensable once you hook it up to the Lina Network DAC and hear the difference it makes. I should also add it is not just applicable to the Lina system. If you have a Bartok also you can hook it up to the Master Clock and get some interesting results. We will also be pushing out a dedicated review of the Master Clock in the coming weeks that go into further detail about how it performs. How best to describe the Master Clock effect on the Lina Network DAC performance? Dynamics is probably the first thing I would refer

to. Everything sounds punchier, more incisive like shining a light or a magnifying glass on both the detail and pace at which that detail appears and disappears. It's kind of like the difference between the bounce of a taut and fresh tennis ball compared to a slightly deflated or overly used version of the same ball. The bounce is softer, and flatter with the old ball coming back to you at a much slower pace. For example, using the Lina network DAC alone with the Lina Amplifier paired to the HD800 you get a comparatively flatter performance. Whereas moving to the Master Clock enhanced the bass dynamics, introduces better clarity in vocal layering mixes, and transforms the soundstage into a much more complex and deeper sounding experience.

Crossfeed

dCS has been beavering away with their crossfeed profiles since we originally reviewed the Bartok a few years ago. Now, I am not normally a huge crossfeed guy but there are some instances when I do enjoy it, especially if the level of left/right channel separation is quite strong such as what the Sennheiser HD800 can often deliver. With the Lina Network DAC crossfeed turned off the HD800 will give you it's very typical expansive and very wide sound stage and at times you will pick up on the split with vocals often sounding layered or two vocals blasting at you at the same time from the extreme left and right. For me, the HD800 just about mixes them to produce a single believable stereo field but if you are coming from more head gain forward headphones it will take some getting used to. Enter the Lina Network DAC Expanse crossfeed options of



which there are 3 and one in particular which works beautifully with the HD800 called option 'c'. This filter pulls back the stage from a pure left/right experience to projecting the sound field more in front of you like a classic 2.1 setup. In return, the HD800 sounds much more natural to my ear in terms of imaging coherence. It will not necessarily change the coloration of the HD800 but the imaging changes do have an effect of producing a smoother more agreeable sound and a slightly forward vocal to my ear. It also sounds a little less aggressive and more realistic in its presentation.



Voltage Preferences

The Lina Network DAC offers 4 different voltage levels ranging from a very gentle 0.2 and 0.6V output, (IEMs), to your standard 2V as well as a very dynamic 6V output. The 2V will serve you well with the majority of amplifiers if you want to retain the highest level of purity from the resulting analog output. It works best with intimate recordings where you do not need huge dynamic ranges or a lot of punch and power in the performance. I find the 2V a little smoother also for vocal and higher pitching percussion performances, especially with mid-forward headphones such as the LCD-5, though even the Susvara benefitted from this setting with vocals sounding a little less strained in their delivery. The most powerful 6V setting though is very addictive in the way it ups the tempo and drive of any amplifier and headphone performance. It's a solid choice for modern rock and pop with headphones that can dig deep when required. It also seems to particularly suit the already punchy Class AB character of the Lina headphone amplifier. It also does a stellar job with dynamic responsive bass tunings from the likes of the Abyss Diana TC and the DCA Stealth. Both of these headphones have low-end presentations that can be fussy with their supporting setups and might not necessarily 'come out to play' with more reserved amplifiers. Both headphones sounded quite muscular and filled in with the 6V setting from the Lina Network DAC powering the Lina headphone amplifier whereas the 2V shrank the stage a bit and pushed the performance a few rows back losing a bit of PRaT in the process.

Amplifier Setup

Without dipping into a straight amplifier shootout and since we have covered the Lina Headphone amplifier in some detail already I wanted to use this section to get a feel about how suited the stock sound of the Lina Network DAC was to two specific high-end amplifiers, the Feliks Audio Envy and the Cayin HA-300MK2. This is in specific reference to headphone pairings and how each amplifier responded to both the crossfeed and the voltage output of the Lina Network DAC and which settings seem to work best with select headphones.

Core Tonal Qualities

What I can say is that the core attributes of the Lina Network DAC remain fairly true to each amplifier with a very detailed punchy and clear performance and an excellent, albeit robust, vocal body with an energetic delivery depending on which output voltage setting you use it with. More so with the Envy which seems particularly suited to the Lina Network DAC sound signature traits being already a punchy and weighted SS rectifier tube design with a strong vocal focus. Having said that, the HA-300MK2 sounded particularly lively and detailed with the Lina Network DAC pairing. The Cayin's low-end performance does get a bit of a lift over more neutral DAC pairings such as the Hugo TT2 and the Aquarius and at the same time, the excellent holographic staging performance of the HA-300MK2 remains intact if not even more rapier-like in its delivery.



Cayin HA-300MK2 Tweaks

What headphones you are using with each amplifier does require a small measure of tweaks both at the amp side as well as on the Lina Network DAC side to get the right tonal quality just right. For example, with the Cayin HA-300MK2 ZMF Headphone Atrium pairing the impedance level needs to be set to high on the amplifier side while keeping the voltage output of the DAC set at 2V. I found the 6V setting much too aggressive when adjusting the gain of the Cayin amplifier unless I dropped the impedance setting down to low which isn't ideal for a 300Ω-rated headphone. This combination kept the Atrium very smooth sounding with plenty of useable volume control. With the Sennheiser HD800, I would also suggest the same settings but throw in the Crossfeed option C at the same time. The Cayin casts a very wide and holographic soundstage with

most headphones, at least when compared to the Envy it does. Turning on the Lina Network DAC Crossfeed will give the HD800 a much more natural soundstage quality and combined Cayin a very calming tonal quality at the same time. Paired with more current intensive planar headphones such as the Final D8000 Pro I felt the 6V Lina Network DAC output setting combined with the low impedance setting of the Cayin amplifier to produce the smoothest timbral coloration and the punchier low-end response.

Feliks Audio Envy Tweaks

With the Envy, using the likes of the Abyss TC and the Susvara I had no issues opting for the 6V output from the Lina Network DAC and still got a very useable level of volume control with the amp's high output power setting. The Envy is the perfect partner for those who want more of a sense of urgency and rhythm from their tube amps without sacrificing any detail. It is a bit narrower than the Cayin amp and not as holographic but compensates with excellent depth. I felt the Lina Network DAC warmed up to that task and in no way robbed the Envy of that signature tuning with two headphones that need plenty of current and voltage to sound just right.

Select Comparisons

dCS Bartok (DAC only)

The Bartok is somewhat of a precursor to the Lina and was reviewed by us in 2020. It is still priced at a higher level than the Lina with a recent firmware upgrade, (Bartok 2.0).

Technical

Both of these devices use the non-APEX Ring DAC implementation and on the surface, you might be tempted to call it a draw since the feature overlap is plentiful. However, there are some physical and technical differences, not to mention performance between the two DACs. Physically, both are gen 1 in terms of hardware implementation with the key difference in the Lina Network DAC PC board implementation being folded to fit the housing and the Bartok version flat in design, (bigger housing). Decoding capability is also quite similar with both DAC offering a maximum of DSD128 native and PCM 32BIT/384kHz with onboard MQA decoding capability. The recent Bartok 2.0 mapper update does add some additional DSD features including DSDX2 upsampling and a 5th DSD filter with a more relaxed roll-off with a smoother phase response for lower out-of-band noise performance which the current Lina firmware does not offer. Both integrate beautifully with Mosaic for streaming services and UPnP/DLNA on local networks though I do find the Lina Network DAC LED display to be the more legible and organized of the two with respect to streaming data such as sample rates, titles, and the streaming service you are connected to. Bartok's OS is more in-depth but you do have to remember that it also caters to its integrated amplifier so, there is additional functionality such as channel balancing and a deeper generator profile for burn-in.

dCS Bartok Design

Strictly speaking in terms of the DAC only, the Bartok far outweighs and outsizes the narrower Lina Network DAC. The Bartok demands an entire shelf on a rack whereas the Lina Network DAC can squeeze into much tighter spots. Not that the Lina is in any way small but at 16kg plus the Bartok is



about the heaviest component I have in my collection. The design language is definitely dCS for both in terms of their classical minimal styling but obviously, the touchscreen dimension and bigger LCD screen on the Lina Network DAC feel more modern in both application and useability. The physical buttons on the Bartok will seem fiddly compared to the Lina Network DAC's touch-sensitive operation, however, via Mosaic the experience will be very similar. The I/O is also a bit more complex on the Bartok with dual RJ45 instead of a single ethernet socket offering both a loop and main gigabit variant and also a World Clock output as well as dual BNC input. You also get an RS232 socket on the Bartok which has a number of

functions controllable by the OS such as power linking with the Rossini and some technical level remote control. In all other areas, the Lina Network DAC is on par with analog outs both balanced and unbalanced, triple SPDIF inputs, as well as dual AES and USB inputs.

Performance

Though both are drawn from the same Ring DAC architecture the resulting output via the Lina amp has some noticeable differences. The Bartok DAC brings a smoother denser tuning when compared to the more neutral but punchier Lina Network DAC performance. I picked up on this immediately with two aspects, namely percussion timbre and the overall bass density from our tested headphones, the LCD-5 and the MM-500. The Bartok carries a bit more warmth and softens the note's leading edges giving it a very natural tone with a longer note decay. The Lina network DAC delivers a more precise high-energy neutral tone but a drier high-frequency tuning. With percussion hits lingering a little less it can create a perception of heightened clarity and more space. Though it lacks the warmth of the Bartok tuning it does slam harder and has a bit more 'drive' than its older sibling. All that changes with the Lina Master Clock turned on and I suspect this is where the Lina DAC becomes the next level for me compared to using the Bartok DAC alone. Everything becomes more vivid sounding and more holographic also. There is improved separation, especially on the bass layering and impact. Also, vocal imaging comes to the fore, much easier for our tested headphones to pick out micro-detail, especially if there is a vocal layering added to the audio track. Better high-frequency reproduction seems to add a bit more sparkle and headroom from the LCD-5 as well. There is a slight dynamic range lift overall from the Lina DAC and Master clock combo compared to the Bartok DAC alone.

Musician Audio Aquarius

The Aquarius is a recently reviewed high-scoring DAC and the bigger sibling or flagship equivalent to their entry-level Pegasus reviewed last year. For this comparison, we again used the Lina Headphone amplifier with both DACs connected in balanced mode to the amp and the Abyss Headphones Diana TC for our test headphones.

Technical

A very different approach to designing a DAC internally though in some areas, at least on paper, the Aquarius competes quite well. For a start, the Aquarius is an R2R DAC which means a ladder design consisting of tightly matching resistors discreetly engineered. It uses four ladder rails of discrete 24BIT resistors handpicked to within 0.005% precision resistance for core R2R native 1BIT PCM decoding capability. It also has an additional ladder for 6BIT DSD processing, (32 steps FIR Filters). dCS will argue that despite the tiny margin of error, there is still an element of error. And that error is continual given that R2R's current source management is the same for every bit thus the resultant analog signal will carry some level of distortion with it. Hence, dCS pitches the Ring DAC as superior for error and thus distortion control via a thermometer-coded DAC design and its Mapper implementation to decorrelate errors and remove linear distortion from the signal. Thus, the Aquarius offers higher decoding rates when compared to the Lina Network DAC at up to DSD1024 and PCM 32BIT/1536kHz using its custom-designed USB solution. However, dCS's contention is that the output from Lina's lower DSD128 and 32BIT/384kHz performance is going to offer better distortion control and a better level of detail. Of course, one cannot put a price on preference, but at least that is the technical pitch and to my knowledge, no one has yet produced a set of measurements showing an R2R DAC to outperform a Ring DAC system for low noise performance.

Design

I love the design of the Aquarius, it's a bit sleeker, lighter, and similarly minimalistic compared to the Lina Network DAC design. However, even I have to admit that the bigger and bulkier Lina is a lot more feature rich with a vastly more modern interface. The Aquarius does very well in terms of immediate access to some very strong upsampling and filter options and combined with NOS/OS interoperability it's fairly feature-rich for an R2R DAC. What it lacks though is the Lina Network DAC's easy-to-understand LED interface which is a lot more informative, and the ability to interface with a network and stream as well as MQA for those faithful to that format. By logic, the lack of RJ45 connectivity or any sort of wireless capability means the Aquarius also lacks a modern audiophile's digital-centric needs also with no app for remote control, updating firmware, or streaming services integration. It is about as classic as you can get for controlling your options. The one ace up the sleeve

of the Aquarius for me is the dual I²S connectivity at the rear panel. Here you can connect to a streamer such as the Cayin iDAP-6 at full bitrate potential and in doing so, add a lot of that missing functionality. Given the price gap, you will still have a fair bit of change left over even after adding a streamer expansion to the Aquarius. Of course, there is no Master Clock integration with the Aquarius, that's a game changer, albeit an expensive one, in terms of resolution and dynamic range. Throw in a superior line out voltage rating of 6V from the Lina Network DAC compared to 3.59V maximum from the balanced output of the Aquarius you can see where another audible advantage might be.

Performance

Kicking off with the one main weakness of the Aquarius which is a slightly below average fixed Vrms output level for both SE and balanced compared to what the Lina Network DAC can offer, especially with its 6V output level. That can make a big difference with the Diana TC. For example, you will find yourself pushing for the controls to get the Aquarius volume matched, and even then there are some technical gaps when comparing both DACs beyond that. The Lina presentation is going to sound more vivid and dynamic and hits a little harder also compared to the Aquarius. It is also the more resolving and powerful sounding pairing with the blacker background. The Aquarius, at similar volume levels, will come across as more languid in its pacing, slightly softer on the edges, and more relaxed, especially through to the mids. I do find the bass depth better than the TT2 performance but not quite as dynamic as the Lina. Also, there the clarity and control are more palatable from the Lina. What I mean by that is the level of instrumental separation and layering is perceptibly superior, more polished sounding also with the resulting presentation able to pull out micro detail quickly but without any smear from the Diana TC. The Aquarius DAC's focus is on creating a familiar analog tone that R2R fans adore, especially in NOS mode. I must admit that the richness of the texture of its vocal performance is also quite beautiful. It is not overly warm, in fact, it is relatively neutral in many respects but certainly, this is the more forgiving DAC when compared to the very transparent and punchy Lina Network DAC tuning.

Chord Electronics Hugo TT2

Like the Bartok comparison, the Hugo TT2 is multi-featured. It includes a headphone amplifier, pre-amp capability, and modular expansion connectivity to incorporate other Chord devices such as the M Scaler. However, just as in the Lina Headphone Amplifier review, we will narrow the focus on one aspect only, the DAC. In this instance, we will use the Lina amplifier in order to compare both DACs connected in a balanced line-out configuration.

Technical

Both companies are well known for designing their own in-house DACs and they are very different from each other in their approach to DAC designs. The Hugo TT2 focuses on the tap limitation of delta-sigma blocks and hugely expands it with their in-house FPGA-focused engineering to go beyond those '100s' tap markers into nearly 100k taps using a Xilinx Artix 7 FPGA processor and FIR filter-based design. The processor allows for a much more complex level of filtering with no less than 86x 208MHz cores running in parallel. This allows the TT2 DAC to deliver an advanced 16FS WTA 1 filter with a ceiling of 98,304 taps. The Lina Network DAC's Ring DAC is a discrete design that combines a proprietary FPGA control board and a thermometer-coded DAC design. The main purpose of the control board and the mapper implementation is to reduce noise, properly noise-shape the stream, and ensure the clocking is ultra-precise, i.e., do away with digital jitter before moving it to the analog conversion. The DAC uses dCS's own proprietary mapping algorithm to take the sampled audio from the control side or decorrelates it from the signal thereby rendering mute any parts performance shift that can come from resistor-based topologies. In theory, the Ring DAC performance will not shift or denigrate over time as some ladder DACs can do.

Chord Electronics Hugo TT2 Decoding

The Hugo TT2 does have an edge here in pure numbers with a decoding ceiling of DSD512 and PCM 32BIT/768kHz compared to DSD128 and PCM 24BIT/384kHz on the Lina Network DAC. The Lina can also handle MQA, something which on principle Chord has never introduced into their decoders. Of course, how relevant that is to you depends on what you have on file. The Lina is firmware upgradeable for decoding s.o the lossless limits of decoding may not be fixed in stone for dCS. The Lina Network DAC does have built-in upsampling capability via its OS and dCS Mosaic and it can also integrate with the

Lina Master Clock to further refine the sound. This makes a big difference. The TT2 can also be stacked with the M Scaler via a similar dual BNC for a very comprehensive upsampling capability though it is not the same functionality as the Master Clock.

Design

The Hugo TT2 is the lighter and more compact unit weighing in at around 2.5kg compared to the heftier 7.4kg of the Lina Network DAC. It is also a lower profile with fairly diminutive dimensional measurements so, tiny spaces are more workable though the shoebox style of the Lina will not be too demanding of rack space either. Both are modular units with the TToby and the Hugo M Scaler all part of an integrated stack similar to Lina's amp, DAC, and Master Clock. However, the pitch is quite different with the Chord stack more for desktop quality HiFi and the Lina stack still resolutely functioning as a high-end headphone system. Aesthetically, very contrasting in the design language. The Chord is somewhat asymmetrical, with a mix of see-through ports in the middle, shaded antennae windows, and LCD panels to the left. It is stylistic but nevertheless a busy interface giving you control of not just the DAC but also a headphone amplifier and preamp. The Lina Network DAC has a more minimalist outward appearance. However, it's a better demonstration of design simplicity for me with a bigger and much more useable LCD screen and an easy-to-learn touchscreen control system compared to the challenging orb color scheme on the TT2. Chord does supply a physical remote control whereas the Lina Network DAC relies more heavily on the Mosaic app, (or UPnP compatible app), for remote functionality.

Performance

The first challenge in comparing these two is their respective line-out voltage levels. With the Lina Network DAC, you can change it anywhere from 0.2 to 6V with a total of 4 settings, however, the Hugo TT2 is fixed at 2.5V SE or 5V balanced. The TT2 amp mode's variable voltage control is too powerful being designed to interface with a power amp for HiFi settings. That does mean a very slight but noticeable performance difference between the 5V balanced and 6V balanced output of the Lina Network DAC. Especially with harder-to-drive headphones such as the Susvara and the DCA Stealth. This is aside from each DAC's own inherent characteristics so, aspects such as volume need pushing a bit more for the TT2 with the overall dynamics and staging depth feeling a little flatter and narrower. Personally, the additional dynamic thrust of the 6V Lina Network DAC works a lot better for me when looking to shake-up the low-end of the Stealth. However, dropping both DACs down to 2V/2.5V it is a more even contest for vocal tones and here it comes down to which coloration you prefer.

Coloration

The Lina Network DAC really pushes harder on the Lina Amplifiers AB characteristics than the TT2. That means a heavier more powerful fundamental whereas the TT2 is punchy but slightly lighter in sub-bass weight from around 200Hz downwards using the same Lina amp setup. The TT2 does up the ante offering a slightly warmer and smoother mids presence. It sounds slightly mid-forward, perhaps more forgiving also, but without that supporting fundamental to add the same authority with the aforementioned headphones that I get with the Lina pairing. The Lina Network DAC has a bit more treble shining through offering additional contrast in instrumental timber and a marginally shorter decay to most of its midrange. I find the mids body and vocals, in particular, to sound a bit more robust and vivid in their delivery as a result. Now, with headphones like the LCD-5 and the newer MM-500 to a lesser extent, I was expecting it to sound sharper on the upper mids but that was never the case. More forceful yes but the harmonic balance was accurate and the resulting tone was still very pleasing to the ear.

Our Verdict

The dCS Lina Network DAC is an outstandingly detailed and natural-sounding decoder with a ton of useful features and a very modern supporting app bringing the best of the internet and network right to your fingertips. I would love to just say it's the star of the modular Lina stack but it's hard to talk about the DAC alone without mentioning the transformative effect of the Master Clock and how well it pairs with the amplifier at the same time. Still, if you want energy, dynamics, and a very strong level of detail retrieval without smear or bloat this DAC will give it to you. What is missing? Well, I would have loved to have seen a WiFi module inside alongside the RJ45 just to give it a bit more freedom in placement and power amplifier users

in a HiFi setting probably would be hoping for a pre-amp capability to go along with those excellent but fixed line-level voltage settings. However, for headphone users, unless you are wedded to the romanticism of the R2R sound this is one of the top performers and possibly one of the best DACs I have reviewed to date.