



PRESS RELEASE

Naim launches Zero S/PDIF Jitter DAC

25 August 2009. Salisbury The Naim DAC is a true high-end product that can deliver an audiophile and, more importantly, a musical performance from virtually any digital source. It is also a truly convenient way to access music. The Naim DAC is the world's first¹ Apple authenticated high-end DAC, which means it can connect digitally to any iPod² or iPhone and take the output digitally of anything that would have been sent to the headphone output. This includes UPnP streaming, the thousands of internet radio stations available via apps on the iPhone or iPod Touch and all the music stored on any iPod. The Naim DAC will be available in late September early October.

¹ While the Naim DAC has passed all internal and first stage Apple approvals Naim expects final approval in two to three weeks.

² iPod generation 5 onward



Overview

The new Naim DAC is a high performance zero S/PDIF jitter digital to analogue converter. It is power supply upgradeable, includes eight S/PDIF inputs: Two 75Ω BNC, Two RCA and Four TOSLINK (EIAJ optical). In addition, the Naim DAC includes a USB (Type A socket) on the front and rear panels, which facilitate USB memory stick playback and fully authenticated digital connection from an iPhone or iPod.

What makes it a Zero S/PDIF Jitter DAC?

Besides the usual attention to the finest detail for which Naim's R&D is world-renowned and which will be obvious from the list of key points below, the special element of the design is the way in the Naim DAC that the master clock is not recovered from the S/PDIF signal as in other DACs. Instead, the incoming audio data from S/PDIF is stored in solid-state memory and then clocked back out to the DAC chips using a fixed-frequency local master clock.

This eliminates jitter caused by S/PDIF. In essence the memory, master clock and DAC structure behaves in a similar manner to the CD, master clock and DAC structure of a CD player.

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The Naim DAC's high-speed DSP (digital signal processor) front-end is electrically isolated from its high-resolution DAC and analogue circuits. The two sections are also run from separate power supplies significantly reducing the effect of RF noise (S/PDIF is a source of RF noise) from the S/PDIF circuitry on the DAC stage.

Naim's buffer or memory method of jitter removal relies on a simple concept: the audio data is clocked into the memory at the incoming inconsistently-timed rate, and is then clocked out of the memory and into the DAC chips using a precise clock. The rate at which the memory fills and empties is controlled by selecting the master clock that best matches the average incoming clock frequency. In this way, the data entering the DAC chips is completely isolated from the incoming jitter.

The Naim DAC digital filtering is handled by an extremely powerful SHARC DSP chip running unique Naim authored code to create an ultra high precision 40bit floating point filter. The filter over-samples by 16 times on 44.1kHz data and provides stop-band attenuation of 156dB with virtually no pass band ripple. Following the digital filter are the DAC's two mono Burr-Brown PCM 1704 digital to analogue converters, as used in the CD555 CD player. Finally, the Naim DAC features a very high performance, low noise, and low distortion fully discrete analogue output stage.

All that technology - what does it sound like?

Naim's reputation has not been built on technology alone. It has been built on delivering sound quality driven by solid engineering, clever use of technology and of course consistent reliability and customer service.

The Naim DAC is no exception; its musical performance is quite exceptional. It combines the detail, control, and accuracy of truly great digital playback with a musical sense of performance and inherent rightness that is a joy to listen to. Old and new recordings become alive, with a sense of renewed vitality and communication.

Key Points

- Zero S/PDIF Jitter design
- 8 S/PDIF inputs: 2 75Ω BNC, 2 RCA and 4 TOSLINK (EIAJ optical)
- 2 USB inputs
- 10 separate sine wave (Colpitts) generated clocks for lowest RF noise generation.
- Fixed frequency clocks for zero S/PDIF Jitter
- 16 Times oversampling of 44.1kHz or 48kHz signals
- Automatically switches to asynchronous sample rate conversion if input is out of specification
- Memory buffered digital input
- Naim custom designed Digital Filtering and 16 times oversampling (aka Integer Upsampling)
- Two mono PCM1704 DACs as used in Naim CD555
- Power Supply Upgradeable – just add a Naim XPS or 555 PS
- Apple authentication chip
- Full digital connection to iPod (5th Gen onwards) and iPhone



- USB Stick music playback to 24Bit 768kHz with control of tracks played
- Isolated S/PDIF inputs
- Power Supply and Digital processing completely isolated from DACs and Audio Output
- Remote controllable: Naim remote or Apple remote
- Field upgradeable firmware
- Ground switchable for optimal performance with all systems
- iPod charging is switchable for best sound quality – Not charging sounds better.
- SHARC® processor for flexibility in digital filtering and future upgradeability
- Fully input integrates with a Naim integrated amplifier or pre-amplifier: becomes inputs 7-0
- Front input buttons double as transport function buttons when USB or iPod is connected.
- Linear Power Supply
- 210VA Toroidal transformer with 26 regulated low impedance supplies
- New bayonet PCB mounting for all circuit boards
- Switchable DIN / RCA analogue output connectors decoupled from case for low microphony
- Slim line non-magnetic low-resonance chassis and sleeve
- Machined from solid, brushed and anodised front panel
- Designed and manufactured in Salisbury England.

Background

We have all heard of jitter when talking about digital signals but very few of us truly understand it. We have all read on forums that it is digital so two digital cables cannot sound different. We have all heard the expression “bits is bits” usually expressed ironically by those just about to say two things sound different. Digital is an element of hi-fi reproduction where people can get very heated and opinionated. It is an area where Naim is quite confident to say there is more to discover.

If we said that two sets of the same digital information (bits) in exactly the same order and at exactly the same time and including no spurious like injected RF noise **might** sound the same, we should be a lot closer to reality.

The truth is we do not know for sure. Along with other experts, we have views and opinions but so far that is all they are. The fact that there are no DACs that are truly source agnostic would indicate that the perfect DAC like the perfect mousetrap has yet to be built. However much experts might like to say they have all the answers we know they do not. We learn more every day. One very good reason for a firmware upgradeable DAC.

The DAC designer is dealing with high frequency information (bits), timing information (clocks) and RF noise affecting both, before the more conventional elements of power supply, case, microphony, and of course control functions. It all makes for an interesting time.



Why now?

Given the number of potential digital sources available now it was only logical that Naim's R&D started a project to design a standalone Digital to Analogue Converter (DAC) that was sonically comparable to a high-end CD player.

Naim's digital design philosophy was that the digital audio master clock must be positioned close to the DAC chips. This philosophy has always required Naim to design one box CD Players in terms of their analogue and digital circuits. Some of course had an external power supply.

Designing a consumer DAC so that the master clock can be in the right place, all the jitter that adding the DAC could add is eliminated and where it's technically possible to improve on the off the shelf digital filters has been, until now, a desire rather than a possibility. Now it can be done.

Specification

Audio Outputs

Outputs:	2 (RCA or DIN, selectable)
Output Level Fixed:	2.2V RMS
Output Impedance	< 20Ω
Frequency Response:	10Hz to 20kHz +01dB/-0.5dB
THD:	<0.002%

Inputs:

Digital Inputs:	8 (2 75Ω BNC, 2 RCA, 4 optical TOSLINK)
USB:	2 (one front, one rear. Front overrides rear)

Control

IR input:	Front IR Receiver
IR input/output:	Rear panel 3.5mm jack sockets

Formats

Audio files USB playback:	WAV (LCPM up to 768kHz / 24bit)
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Sample Rate

USB	32kHz to 768kHz / 24bit
S/PDIF	32kHz to 192kHz / 24 bit
iPod, iPhone	48kHz max

Power

Supply Voltage:	100V, 115V, 230V, 50/60Hz
Power Consumption:	<30VA (max inc. iPod charging)

Physical

Dimensions (mm):	70 x 432 x 301 (HxWxD)
Weight:	5.6 kg
Shipping weight:	8.0 kg
Shipping Dimensions:	200 x 580 x 500 (HxWxD)



See note 1 above



"Made for iPod" means that an electronic accessory has been designed to connect specifically to iPod and has been designed to connect specifically to iPod and has been certified by the developer to meet Apple performance standards. "Works with iPhone" means that an electronic accessory has been designed to connect specifically to iPhone and had been certified by the developer to meet Apple performance standards. Apple is not responsible for the operation of this device or its compliance with safety and regulatory standards.

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About Naim

Naim has a passionate and committed interest in music. This is as true today as it was at the time of the company's formation in Salisbury, England, over 35 years ago. Enjoyment of music has driven Naim to design and manufacture the finest range of audio equipment available.

Top engineering principles ensure that all Naim products meet and exceed the measurable parameters essential for state-of-the-art performance, safety and reliability: all essential qualities for which Naim is renowned. Measurement alone, however, is not enough: every product must also deliver the emotion of music. This is what makes good hi-fi great hi-fi.

Naim quality requires an attention to detail verging on the obsessive: a special and unique approach to component selection and system design, all within a highly specialised production environment. Every aspect of a Naim product's design is considered for its impact on sound quality.

Naim's toughest critics are its management and its employees. Together with customers – music lovers and numerous musicians, who regard Naim's products as the closest to live music – Naim push onward on a path of continuous improvement.

Naim does not chase market fashion and will not move from its overriding objective of achieving consistent musical performance. The company has its own record label, the Naim Label, which specialises in high-quality music recordings. Naim has moved steadily into the world of Audio Video and Multi-Room, introducing the award-winning n-Vi CD/DVD all-in-one player and a range of multi-room audio products: NaimNet, designed to bring new customers to the Naim fold without sacrificing Naim's legendary performance. Naim also announced an exclusive partnership with Bentley Motors in 2008, with the launch of the Naim for Bentley Premium Audio System, which is available across all Bentley models.