PRIMARE
DAC30

Price Indicated: € 2,490

Remember, a few months ago, our enthusiasm was sincere on the subject of the BD32 universal reader, uniting the best of both worlds in audio-video. Indeed, we were captivated by the truth of the colours, contrast, the grey-scale of the image and the obvious musicality of this exceptional BD32. Primare has renewed the performance, drawing on work done on the audio section of the BD32 by offering a pure universal converter, the very high performing DAC30.

It is capable of handling all stereo digital sources (24 bit, 192 kHz) with such definition that you can really enjoy the quality of high resolution lossless music files via a computer, but also naturally from the digital outputs on CD players. It has a wide range of digital inputs including: Asynchronous USB, AES EBU balanced stereo, three coaxial S/PDIF connectors and three Toslink fibre optical connectors. Finally, it has balanced and unbalanced analogue output stages with low distortion, which also contribute to the exceptional musicality of this model converter. In fact, its design power is based on a balance of excellent filters and individual power supplies for the conversion circuits, and a discrete and well designed analogue section, resulting in an extremely high standard for obtaining the best signal/sound ratio and the highest resolving power for low amplitude signals, essential in the pursuit of true musicality.

Construction

A careful construction, with properly chamfered black aluminium frame; each corner has been carefully rounded. Mounted on three feet, which are reminiscent of those used on the BD32, the design has a restraint

that we appreciated. The use of white LEDs in low light seemed perfectly suited to the discretion expected from such a device. The first row lists the five sources. A second, the sampling frequency detected. Two elegant and discreet buttons help to control everything for source selection and the on/off for the device. On the back, we are pleased to discover a set of balanced analogue outputs, which also proved to be more efficient than the unbalanced output.
Moreover, we see that the internal construction of the product is also balanced. The main part of this connection is through 3 S/PDIF inputs with RCA format and by three fibre optic inputs. We then find an AES/EBU digital input and the no less conventional USB 2.0 type B input.

The remote turns out to be quite comprehensive and pleasant to use. Too often overlooked with this type of device, the source switching cannot naturally be done automatically; this seems right to us, especially when, with the help of a learning remote and programmed macros, integrating the source switching is indispensable. Finally, we note that the remote can control other devices from the brand.

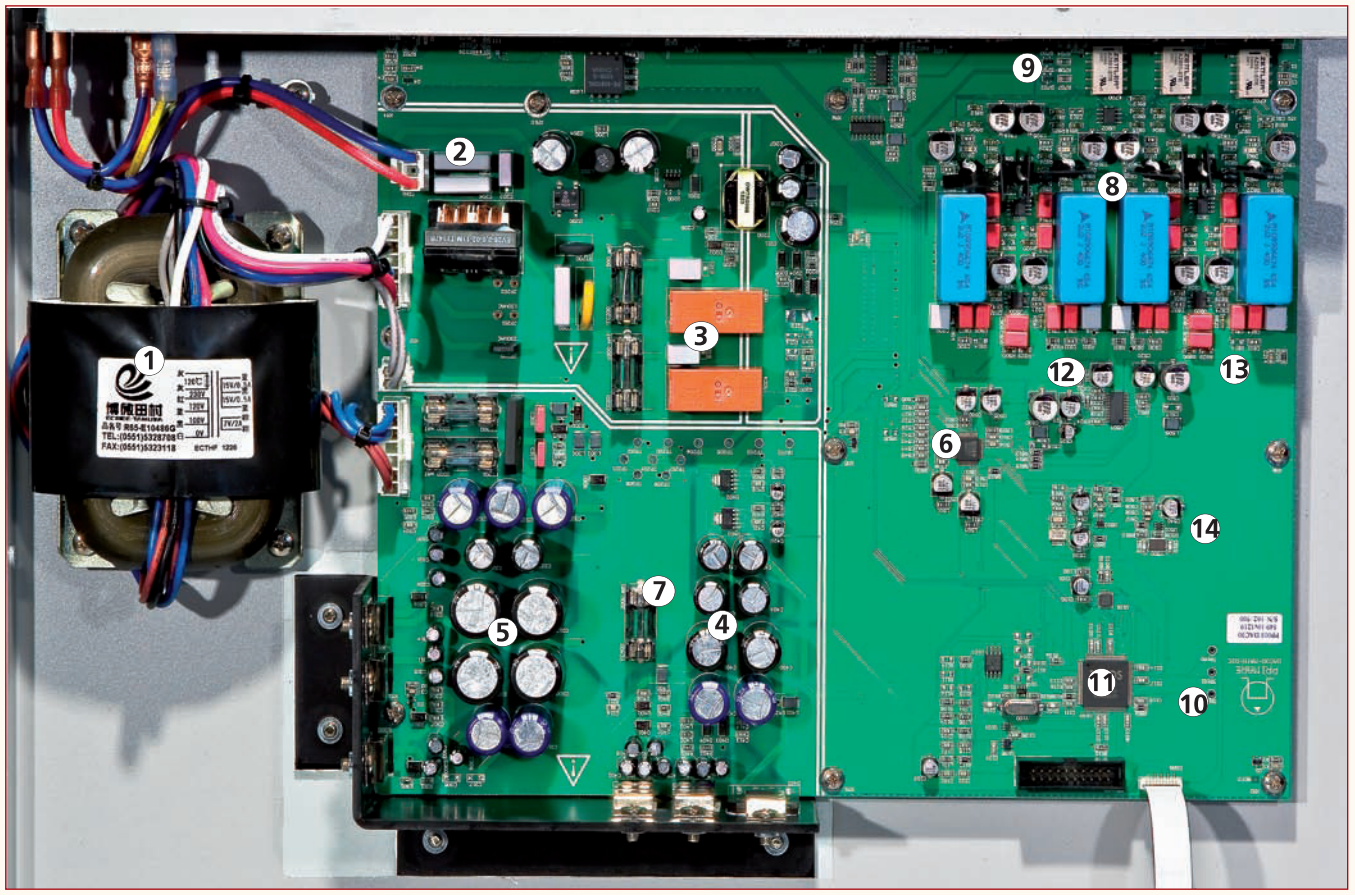
The interior also stirs our interest. Right away, we detect the R-Core-type transformer, which is an important contributor to the musicality of the DAC30. R-Core transformers, by their construction, are about 30% more compact and 40% lighter than their EI counterparts. Their uncut structure and specific development has reduced leakage for an excellent efficiency above 90%. Similarly, their structure limits resistance losses, heating is reduced. The filtering area is well separated on the layout, and we see the spread and symmetry (as advertised) of the analogue section. The power transistors are cooled by heat transfer, screwed to the frame. The technology used at the heart of the device is based on a typical Primare assembly: analogue portion filtered and regulated twice, output stage based on Texas Instruments OPA 2134 operational amplifiers, WIMA capacities, EPCOS filtering and MELF resistors.
The design, based on an integrated card of 4 layers, is also advantageously used to implement the muting function by an atypical circuitry based on a relay. USB streaming is entrusted to a XMOS transmission stage in USB 2.0. Constituting one of the two major industry standards, it offers perfectly united performance and stability for the construction of audiophile equipment. Note that the XMOS devices require the use of a driver in the Microsoft Windows environment, which introduces a clear and analytical signature to the sound; we will see later that this was perfectly anticipated by Primare.
The S/PDIF inputs come out, like the output of the XMOS chipset via its SMSC transceiver, on a conversion stage managed by the classic Texas Instruments SRC4392. This works on a 24-bit platform and supports all multiple sampling frequencies of 44.1 kHz and 48 kHz up to 192 kHz.

TECHNOLOGY BY THE IMAGE

1 - On/Off Button. In the Off position, the device is in standby, the main switch is located on the back
2 - Source Selector, alternates between the 5 inputs, 3 S/PDIF, 1 AES/EBU and USB
3 - Source, the LED display can be removed using a Primare C23 or C33 remote control
4 - Sampling, LED display of the sampling frequency detected

1 - Analogue outputs on XLR jacks for a connection to the integrated preamplifier/amplifier. We strongly recommend its use because the internal setup is due to the symmetrization
2 - Unbalanced analogue RCA outputs for connection to the integrated preamplifier/amplifier.
3 - 1 RCA S/PDIF 75 Ω input up to 192 kHz
4 - 1 Toslink S/PDIF input up to 96 kHz, the input is coupled with the RCA 1 input
5 - 2 RCA S/PDIF 75 Ω input up to 192 kHz
6 - 2 Toslink S/PDIF input up to 96 kHz, the input is coupled with the RCA 2 input
7 - 3 RCA S/PDIF 75 Ω input up to 192 kHz
8 - 3 Toslink S/PDIF input up to 96 kHz, the input is coupled with the RCA 3 input
9 - AES/ABU digital input on XLR file
10 - USB 2.0 input requires loading a specific driver on the Primare site for use with a PC running Microsoft Windows. The support is direct via the USB 2.0 Mac driver.
11 - Digital S/PDIF output on RCA 75 Ω outlet up to 192 kHz. To connect the output to a digital amplifier.
12 - Female IEC power outlet
13 - ON button, the front button for standby

TECHNOLOGY BY THE IMAGE



1 – Exceptional transformer, 15V 5A and 7V 2A which will supply the analogue and digital sections separately. It is observed that impressive filtering is executed: 48,000 µF for the digital section, 74,000 µF for the analogue section. 2 – Input of the filtering sector using a passive Shafner filter in common mode. 3 – The set comes out on the 5V 8A relay. You can observe that a first set of fuses protects the device in the same area. 4 – Filtering area by a set of carefully assembled capacities that will offer a better impulse response and improved dynamics. 5 – Screwed to frame, 6 transistors execute the output stages for both channels. For the balance, use of Mosfet known for their musicality. 6 – Regulation based on a different assembly for the digital and analogue parts. The digital part is based on a 5A regulator; in input they transform to a low voltage (here, a priori, 5V in terms of the power stage) a high current with very low power surge (low dropout). The analogue part uses a two-stage LM317/337 based assembly and then transfers to a discrete high speed circuit located in the region of the analogue components. 7 – Texas Instruments OPA2134UA operational amplifier specifically designed for high-fidelity. The noise filtering is particularly well done, what is also confirmed upon listening to the device is that it shows, even with a very weak signal, an amazing resolution and background noise without any skipping. 8 – Analogue output management with meticulous power management by WIMA capacity bridge by unbalanced or balanced analogue output. 9 – Source selector processing area managed by a TI HC151. 10 – XMOS USB 2.0 chipset, asynchronous management of the connection for the computer via USB Type B in that back of the unit. 11 – 16 Mb flash memory for the execution of the device firmware. 12 – Analogue converter to Digital Texas Instruments SRC4392, excellent component with a dynamic of 144 dB to -60 dB for a total harmonic distortion of -140 dB. 13 –Cirrus Logic CS4398 converter, 24-bit/192 kHz with DSD Support. The dynamic is 120 dB for a total harmonic distortion of - 107 dB. 14 – SMSC 3318, high speed USB transceiver. The role of the transceiver is to receive and send data. Here, this model is responsible for managing the flow to and from the XMOS chipset.

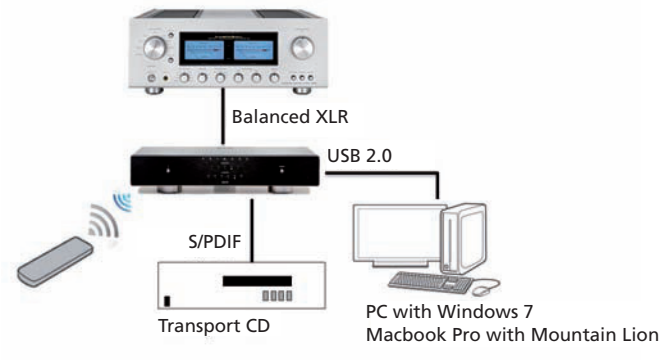
The Primare DAC30 by numbers

The integrated TI SRC4392 allowed us to transfer all the test tracks via USB or S/PDIF.
We therefore offer the following summary table:

Frequency	Dynamic (bits)		Coaxial	Toslink	USB
44.1 kHz	16	24	✓	✓	✓
88.2 kHz	-	24	✓	✓	✓
48 kHz	16	24	✓	✓	✓
96 kHz	-	24	✓	✓	✓
176.4 kHz	-	24	✓	(1)	✓
192 kHz	-	24	✓	(1)	
384 kHz	-	24			
352.8 kHz	-	24			
2822 kHz	-	1			

Listening Conditions

The Primare DAC30 is a converter only. We built a configuration accordingly with several different sources upstream. We suggest you consult the following diagram to familiarize yourself with the inputs evaluated.



For our tests, we connected the converter alternately with balanced and unbalanced outputs. If you have a preamp or one integrated with balanced line input, it has been proven superior to the unbalanced one.
The audio from high-end CD by RCA S/PDIF input has also been used as a basis of lossless comparison. On the USB input, we connected our usual test computer (Windows 7, Intel i5, 10 GB RAM, SSD, battery operated) equipped with JPlay Version 5.0b in ASIO 64-bit and a Macbook Pro equipped with Mountain Lion and Audirvana.

Listening from a high-end CD player through the coaxial digital RCA S/PDIF input of the DAC30.

This first phase began with particularly difficult reading and converting of the tracks of the "*Denon Audio Technical*" test CD for measurements and listening. However, the DAC30, with clarity, precision, and exceptional differentiation, managed to convert the tracks to - 40 dB and even stronger to - 60 dB, without the slightest skip, or distortion, revealing superb dynamics in the process. Indeed, at - 60 dB, the small string section is revealed, with distinct separation between cello, viola, violin (with the majority of converters, this track converts with an intolerable misrepresentation of the most gifted – the strings sound like a "strangled cat"). But the most surprising concerns the holding of the phrasing in the sequence of the piano notes, always at - 60 dB, when most converters overlap an intolerable and variable level of noise on each note, distorting the timbers so that they become unrecognisable. This level of definition has previously been possible only through converters up to ten times in price, and accords with our measurements of the DAC30, where the floor of - 130 dB is reached easily - the limit of our current equipment.

Specifically, this performance, in its compliance with harmonic structures and differentiation of dynamic micro-spaces at rather low levels translates into a genuine definition of micro-information that goes completely unnoticed by a large majority of converters, with the consequence that they fail to transcribe this subtle link that exists between the notes, and when in analogue, are drowned in background noise.
However, most of the great classical artists of jazz, even "popular" music are unanimous about the importance of timing: the resolving the spaces between notes.

With the CD "*The Pulse*", we have a confirmation of this high analytical power, the respect of the passage of accurate timing on the sounds of the bell on the mountainside in espalier, around a Buddhist temple before the dazzling impact of the beam against the side of a huge bronze bell. Indeed, the DAC30 repositions the space not only in width but also in depth for various birdsongs, which in nature are really different in their tones while appearing on the surface to be quite similar to each other.
Numerous sounds in the distance reappear far more significantly, the clink of bottles against each other in a wooden locker has never been so clear. As for the impact of the bell, the energy is present with perfect pitch accuracy. From the moment of impact, the circular effect of decreasing resonance indicates the good maintenance of phase.At the end of this track, the shots in the sub-bass of the cannon in the distance are perfectly clear with a sense of acoustic pressure on the entire body.

Turning to music transcription, the DAC30 reveals extreme resolving power but does not lose the feeling of overall "concert style" homogeneity in large formations such as that of the *Scottish Chamber Orchestra under the direction of Robin Ticciati in the passages from the Symphonie Fantastique by Hector Berlioz*. Indeed, the DAC30 offers a spatial presentation that separates, from left to right, each group of instruments and on several levels of depth. There has been, with a number of converters, a kind of stretching of the radiating surface of the various sections of the strings together a global overlapping of sound. However, in going from right to left, the DAC30 installs at distinct well-separated points, the basses, then the cellos always on the right, but on a staggered plane; timpani distinctly in depth, and, behind it trumpet; towards the centre, the violas, behind them, the oboes, and even further back, the brass. Finally, going to the left, the sections of the first, second violins break away with flutes, oboes, clarinet at their back. This specific but homogenous description provides a real perception of a well-structured sound hologram thanks to the DAC30, which exactly meets the position of each and every different tonal tessitura.

The effect is also evident in the hyper-natural sound of the formation *Swing Band accompanying the singer Candice Parise*, where the DAC30 provides the perception of a natural ventilation of different sound levels on piano, drums, bass, trumpet, trombone; the spread of transparency in each of them, one on another when they play simultaneously. Similarly, the voice of the singer is extremely timely in the foreground with a youthful freshness in the pronunciation of every word that the DAC30 makes very intimate. Whether exposing hardness in the high midrange or effect of a breathless voice, all is expressed "naturallly" (this is typical from balanced analogue output stages with Mosfet).

Listening to lossless files

You could easily fall into the lyricism of pulp literature to express what was felt when listening to some high definition files of lossless music through the DAC30. Indeed, *with the duo Katie Melua and Eva Cassidy in "What A Wonderful World"*, the delicacy of the timbers, and the slightly different vocal heights of the two singers, attains new impact: very close to what we've noticed in thirty years of "thin-skinned" sensitivity! The timbers of the two performers singing some verses simultaneously stand out perfectly with the DAC30: not glued, superimposed, but spatially detached, shifted from left to right, with a plausible perspective of the instruments of the group accompanying them.
This ability to resolve very high definition without aggressiveness brings about an intense life-like immediacy - a refreshing perception of how, for example, the guitarist attacks the Fender's strings with the pick. Another important point that you do not often find in the "decoding" of lossless files: good timing of the rhythm. Here, with the DAC30 as distinct from its peers (thanks to its highly precise internal clock placed as close as possible to the processing circuits) the rhythm is perfectly light without the sensation of fluctuation or slow transience.

The effect is experienced very clearly on the file in 24 bit/96 kHz of the album *Diana Krall "From This Moment On"*, where the artist's set on the piano swings instantly thanks to the respect of the timing of the key strikes and the articulation between the notes with all that is revealed between each of them.
We feel, from the DAC30, a kind of extreme agility in the melodic development without delay, hesitation, trouble. Everything is in place as expressed succinctly by the musicians, but in a relaxed atmosphere. The voice is free of any kind of veil incorporating a type of new youthfulness, with more freshness, spontaneity in the articulation of each word.

By T. Gluzman and P. Vercher

SYNTHESIS OF THE SOUND AESTHETICS

We have extended our listening to several days, rediscovering many files with the DAC30.
While comparing the CD media with those decoded by this converter, we found that it clearly goes much further in the precise decoding of the digital stream. Unless you are completely deaf, it is instantly noticeable because the difference is really striking, not only in relation to other digital decoders in this price category where the DAC30 knocks out everyone but also in the upper price category where it pushes out the established references. The DAC30 reconciles both the analogue and digital worlds so that interpretations find their true musicality. At this price, this is a real bargain.

Manufacturer's Specifications

Analogue outputs: 1 balanced pair in XLR and 1 unbalanced pair in RCA, 4.3 Vrms
Digital Output: 1 x S/PDIF (RCA)
Inputs: USB type B, 3 x S/PDIF (RCA), 3 x Fiber optics (TOSLink), 1x AES/EBU (XLR)
Converter: CS4398
Impedance of output: RCA 100 Ohm; XLR 110 Ohm
Consumption: in standby 0.5 W, turned on 50 W, playing 60 W
Dimensions: 430 x 370 x 95 mm
Weight: 8.5 kg
Finish: Black or Titanium