BelCantoDesign

DAC 2

24/192 Upsampling D/A Converter

User's Guide and
Operating Information
(External & Internal Version)

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DAC2

24/192 Up-sampling Digital to Analog Converter

The Bel Canto Design DAC2 is a 2- channel digital to analog converter that up-samples 16/44.1 signal to 24/192 and applies a 96kHz slow roll off filter. The DAC2 has remarkable performance and long-term value through quality of design and versatility.

Bel Canto Design grew from the quest to achieve the ultimate musical satisfaction from an audio system. This quest began with the discovery of the inherent sonic qualities and musical performance potential of a nearly forgotten technology, the single-ended triode amplifier. The ability of this type of amplifier to recreate the musical experience and evoke a powerful emotional response in the listener, much like the live event, inspired the development of the SET line of amplifiers through the ultimate expression of this technology. The SET circuit was developed for use as both a cornerstone for a modern audio system and as a reference tool for developing more accessible, modern home entertainment equipment.

For more than ten years this effort has continued and the result is a unique line of fine audio amplifiers, preamplifier, and source components that are designed to embody unparalleled musical reproduction. Bel Canto Design's goal is simply to provide the most expressive and powerful musical experience outside of the live event and bring some of the greatest musicians and their performances into the intimacy of your home.

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Design Features

The DAC2 was designed to reveal the exceptional musicality hidden within 16 bit/44.1kHz CD recordings. By up-sampling 16/44.1 material to 24/192, applying Zero-Jitter and 96 kHz slow roll-off technology, the DAC2 will compel you to reevaluate the performance potential of CD based digital audio. The DAC2 is also capable of playing 24/96 DAD recordings, delivering stunning results.

• The goal of the DAC2 Processor development was to remove the last sources of error in the conversion of digital music data to analog signal. These error sources are in four areas:

1) Timing Jitter in the DAC clock.
2) Quantization and Sample Rate Converter noise in the Digital to Analog conversion process.
3) Time domain smearing.
4) Electromagnetic Interference (EMI) distortion sources.

1. The latest S/PDIF and up-sampling receiver technology eliminates Jitter sources on the DAC clock and 24 bit processing lowers the quantization noise floor by over 40dB – well below that of the original recording. The DAC clock in the DAC2 is a local Crystal Oscillator driving the Digital Filter/DAC directly. A buffered clock output from the Digital Filter is sent back to the input sample rate converter circuit where it is compared digitally to the incoming data, setting internal registers for calculating the precise relationship between the incoming S/PDIF data and the DAC clock – *eliminating jitter*. **Result: Clear, superb musical resolution.**

2. The DAC2 uses a Burr-Brown PCM 1738e 24/192 DAC along with 96 kHz slow roll-off digital filter technology for minimal time domain errors, significantly improving transient response. The new Asynchronous Sample Rate Converter (ASRC) used in the DAC2 provides a minimum of 139 dB of dynamic range. **Result: Any filter residue is well below the noise floor of the original recording, providing better imaging and high frequency coherence.**

3. Most processors use brick wall filters that introduce a time smearing effect. The DAC2 uses a 96 kHz, slow roll-off Digital filter, similar to an analog moving coil cartridge. **Result: Analog-like energy response with minimal coloration of high frequency harmonics.**

4. The use of the latest DSP and DAC technologies permits us to package the DAC2 in an extremely tight space and reduced power, reducing critical clock and data line lengths to fractions of an inch. This approach, combined with a 4 layer circuit board, isolated analog and digital ground planes and multiple stages of power supply filtration ensures that EMI is even lower than on the DAC1.

Unpacking

Unpacking (External Version Only)

The box containing your **DAC2** contains the following parts:

- 1 - Power Cable for connection to utility power [1.85m, 6' long] **(External Box Version Only)**

- 1 – **DAC2** Digital Converter.

- 1 - Owner's Warranty / Registration Sheet

Carefully unpack your new unit and check for shipping damage. If there is any damage, or if any piece is missing, please contact your dealer or Bel Canto Design.

Save all packing materials as the packing is specially designed to protect the DAC2 during shipping or transporting. If you lose or damage the packing materials or carton, please contact your dealer or distributor before attempting to transport the preamplifier.

The DAC2's power supply is preset for the proper national voltages before you receive it. The power cable (External Unit Only) will have the correct plug for your local power system. If you believe this is not true, please contact your dealer immediately. Do not attempt to alter or change power settings yourself!

Initial Setup and Placement

Input Panel Connections:

S/PDIF:

- One (1) Coaxial (RCA type)
- One (1) Toslink (plastic optical)

Note: Either one of these two connectors can be used at a time. Which one of these two inputs you use may depend on the quality of the source output to which you connect it. If you have both types of outputs available from your digital source we recommend that you try both before making a decision about which connection to implement.

•RCA Main Output Jacks for Left and Right Channels (External Box)
-These connectors are found on the opposite side of the Digital inputs.

The DAC2 has one pair of RCA type outputs that can be run into any line level input of any preamplifier or integrated amplifier/receiver with RCA type connectors. The output level is the standard 2 Vrms. As with all analog audio sources the quality of the cables is important to ultimate sonic performance and we recommend optimizing these for your system.

-Placement of the DAC2 Within your System (External Box Only):

The DAC2 may be situated within your system in any convenient manner desired. The most typical arrangement places the DAC2 near or behind the preamplifier or digital source in order to make as short a connection as possible.

- **Coaxial/Toslink switch**

A small push-push button switch next to the RCA Digital Input will allow you to switch between either coaxial or Toslink digital inputs. This switch is ideal for those connecting digital audio from a satellite TV receiver, in addition to a CD/DVD source.

- **Indicator Lamp**

A three-color LED lamp activates when power is applied (red) and no signal lock is present. When a valid S/PDIF source is being received the LED will turn green. When using CDs with pre-emphasized encoding the LED will turn amber. The DAC2 will correct proper emphasis automatically.

Specifications

Up-sample Rate • 192kHz

Bit Depth • 16 to 24 Bit

Signal to Noise Ratio • > 117 dB A Weighted

Dynamic Range • 117 dB

THD (Distortion) • < 0.003%

Frequency Response • 2 Hz to 80kHz - 3dB

Output • 1 Stereo Pair RCA

Input Options • 1 S/PDIF (RCA Type), 1 S/PDIF (Toslink)

Output Impedance • 20 ohms

Output Level • 2 Vrms Fixed

Power Requirements • 115/230 VAC; 50-60 Hz 10 watts

Size • 3.6 x 3.6 x 9 inches
Weight • 4lbs