e.One by bel canto

DAC2.7
User's Guide

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DAC2.7

Asynchronous DAC Preamp
with

HDR HIGH-DYNAMIC RESOLUTION CORE™

T A B L E   O F   C O N T E N T S

Important Safety Information

Explanation of symbols used in this manual or on the rear/underside of the apparatus:

The Lightning Flash with arrowhead symbol within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product enclosure that may be of sufficient magnitude to constitute a risk of shock to persons.

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

TO COMPLETELY DISCONNECT THIS APPARATUS FROM THE AC MAINS, DISCONNECT THE POWER SUPPLY CORD PLUG FROM THE AC RECEPTACLE.

THE MAINS PLUG OF THE POWER SUPPLY CORD SHALL REMAIN READILY ACCESSIBLE.

Disconnect supply cord before changing fuse.
Refer servicing to qualified service personnel.

WARNING: TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS APPARATUS TO RAIN OR MOISTURE AND OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES, SHOULD NOT BE PLACED ON THIS APPARATUS.

- Read, keep and follow these instructions.

- Heed all warnings.

- Do not use the apparatus near water, ie near a bathtub, kitchen sink, laundry tub, in a wet basement, near a swimming pool etc.

- Clean only with dry cloth.

- Do not block any ventilation openings. Install in accordance with the Manufacturer's instructions. Site the apparatus so that its location or position does not interfere with its proper ventilation. For example, the apparatus should not be situated on a bed, sofa, rug, or similar surface that may block the ventilation openings, or placed in a built in installation such as a bookcase or cabinet that may impede the flow of air through the ventilation openings.

- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus that produce heat.

- This apparatus uses Class I construction and must be connected to a mains socket with protective earthing connection.

- Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and at the point where they exit from the apparatus.

- Unplug this apparatus during lightning storms or when unused for long periods of time.

- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug has been damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

- Mains plug: Use the mains plug to disconnect the apparatus from the mains supply. The mains plug must be accessible at all times. Use the mains switch (if applicable) when the apparatus is not in use.

- Objects and liquid entry: Do not let objects or liquids fall into the apparatus. Do not expose the apparatus to dripping or splashing. Do not place a vessel containing liquid on top of the apparatus.

- No naked flame sources, such as lighted candles, should be placed on the apparatus.

- The apparatus has been designed for use in moderate and tropical climates

Fuse replacement:

This appliance is fitted with a non-rewireable 10 amp mains plug. The plug contains a 10 amp fuse. If the fuse has blown it can be replaced as follows:
a) Pull out the black fuse cover/carrier.
b) Remove and dispose of the blown fuse.
c) Fit a new 10 amp BS1362 approved fuse into the carrier and push the carrier back into the plug.

Always ensure the fuse cover is fitted. If the fuse cover is missing do not use the plug. Contact your Bel Canto retailer to obtain a replacement fuse cover. Fuses are for fire protection and do not protect against electric shock.

⚠ WARNING: THIS APPLIANCE MUST BE GROUNDED.

FCC NOTICE

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
• Reorient or relocate the receiving antenna.
• Increase the separation between the equipment and receiver.
• Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
• Consult the dealer or an experienced radio/TV technician for help.

Green By Design

All Bel Canto products make use of compact and efficient design principles. Our products use less resources per unit to produce better performance than ever before. Everything from reduced packaging volume, to less weight in transport helps to reduce the overall environmental impact of bringing our products into the market.

Our products make very efficient use of electricity. Low energy usage and compact size ensure that the physical and environmental footprints of all Bel Canto products are minimized. Quality and performance play into this approach as all of our products are designed to remain vital and valid performers for many years. Should you want to upgrade to one of our new products, we even offer trade-in value for your old Bel Canto product to ensure that it is recycled in the most efficient and responsible manner.

RoHS and WEEE

All of our current products are designed and produced to RoHS standards, ensuring that dangerous materials do not enter the waste stream. Lead free electronics assemblies and environmentally safe finishing and production methods are utilized to ensure that our products and processes are environmentally safe.

Bel Canto Recycles

Bel Canto has always been a forward thinking company. In the same way that we are focused on the development of high-end audio products, we are also conscious of what we leave behind. For many years we have implemented environmentally sound measures to make the most efficient use of resources and keep our impact at a minimum.

We reuse or recycle more than 99% of the packing materials for our incoming parts shipments. Each year we divert massive amounts of cardboard, paper, plastic film, and Styrofoam from landfills. Our plastic and Styrofoam is delivered directly to local facilities that process it on site for use in their manufacturing. Steel, aluminum, and other metal waste products are delivered to local metal scrap yards for recycling back into the production stream.

We also participate in Waste Management's e-Cycling program. All electronic waste is processed in the US, with hazardous material being separated from non-hazardous, at ISO 9001 and ISO 14001 certified regional processing centers.

Our commitment to responsible production processes ensures that the absolute minimum of material used in the making of our products enters the waste stream.

Warranty Information

Bel Canto products are automatically covered by a 90 day factory warranty that covers all internal parts and labor. Register online (http://www.belcantodesign.com/Belcanto_Warranty.html) within 30 days of purchase from an authorized dealer to automatically extend your warranty for 2 years starting from the date of purchase. If you do not have web access, please contact your dealer for assistance. Upon fully completing registration, within 5 business days you will receive an email that officially validates your warranty. Your information will be used for internal use only and will not be sold or released outside Bel Canto. Your comments and suggestions are appreciated and help us continually improve our products and services.

The warranty is only valid to the original owner and is non-transferable. Damage caused by unauthorized modification, abuse, or neglect of product will void your warranty. Any cost associated with return of product is the sole responsibility of the owner. All returns require a return authorization number issued after completing the RMA form in the support section of our website. If you have any questions, please contact us online at info@belcantodesign.com.

Unpacking Your DAC2.7

DAC2.7 packaging contains the following:

    1 (one) – DAC2.7
    1 (one) – DAC2.7 User's Guide
    1 (one) – Power cord [6.6' – 2 meters long]
    1 (one) – Remote Control

Carefully unpack each piece and check for shipping damage. If there is any damage, or if anything is missing, please contact your dealer, distributor or Bel Canto Design. Save all packing materials as they are specially designed to protect the unit during transportation or shipping. If the packing becomes lost or damaged, please contact your dealer, distributor or Bel Canto before attempting to transport your unit.

Setup & Placement

The power supply on the DAC2.7 is preset for the proper voltage. The power cable should have the correct plug for your local power system. If you believe this to not be true, please contact your dealer immediately.

This product, like any electrical component, can be dangerous and cause injury if not used properly. Before powering this product, it is necessary to read and follow setup procedures.

Because the DAC2.7 runs cool, it can be placed in many system locations without compromise. We do not recommend placing weights or other objects directly on the DAC2.7. This may scratch or mar the chassis finish. Do not use harsh chemicals when cleaning the outside of your DAC2.7.

Single Ended RCA and Balanced XLR connectors are available. XLR jacks allow balanced hookup using the standard North American pin configuration: Pin1 = Ground, Pin 2 = Signal +, Pin3 = Signal -

⚠ **IMPORTANT!**
Make all connections before powering your unit!

Rear Panel Connections
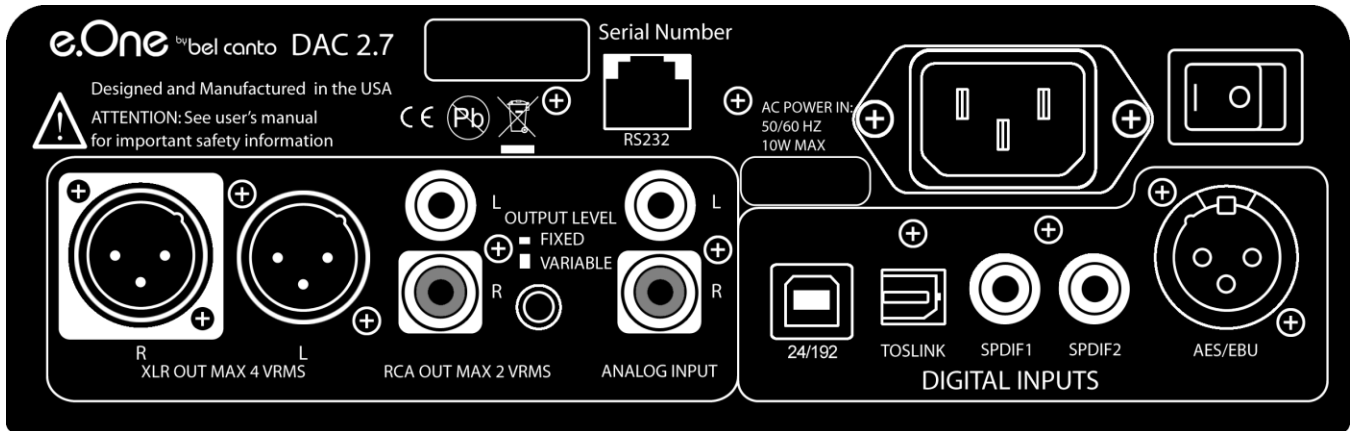
IMPORTANT: If using the DAC2.7 directly into a power amplifier, ensure that the Fixed/Variable Output button is in the OUT (variable) position. Operation in Fixed Mode directly into the amplifier could cause extreme output levels, clipping and damage to the loudspeakers, amplifiers or your ears!

- IEC power cord jack: Connect the supplied or a quality aftermarket power cord from this jack. Note the power setting indicated on the back of the unit before connecting the power.

- Power Switch: Power is on when the switch is toggled to the I position and off in the O position

- XLR or RCA outputs are used for directly driving a power amplifier in variable output mode or a preamplifier input when in fixed output mode

- RCA Analog Inputs

- RS232 connection

- USB Input can be connected to a computer for playback of any audio format up to a 24/192 data rate. The DAC2.7 is enumerated as *Bel Canto uLink Audio* when using the custom Bel Canto USB2 Windows driver with Windows XP or later and Macintosh OSX 10.6.x or later.

- TOSLINK input accepts any standard plastic or glass fiber optical TOSLINK cable and operates to 24/192 data rate

- SPDIF1 and SPDIF2 accepts RCA connections from any 75 ohm SPDIF source and operate to at least 24/192 data rate

- AES/EBU Input accepts any AES/EBU standard 110 ohm digital source and operates to at least a 24/192 data rate

When all connections to and from the unit have been made then double check everything before plugging the DAC2.7 into the power source. After turning on, the DAC2.7 will go through its display check and show the software revision number. The unit will be in Soft Mute with the AES input selected. The volume will be set to 50.0 even if the fixed/variable button is in Fixed mode.

CONDITIONING

The sonic performance of the DAC2.7 will begin to stabilize after more than 100 hours of continuous power up.

Single Knob Control Functions & Display

Front Panel Control Knob:

The control knob is a continuously rotating control with a push-switch function. Always push the button with your finger in the direct center of the knob. Pushing the knob will switch between selectable values on the display. Rotating the control left or right will adjust the selected value.

Upon Power Up:

When switched on, the DAC2.7 will perform its startup sequence followed by displaying the firmware revision.
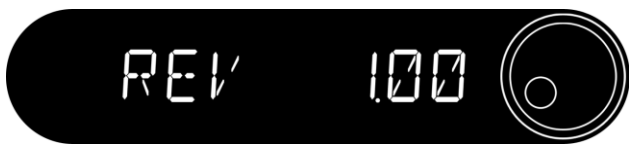
After 2 seconds, Input Selection Mode will become active. The AES input will be selected by default and Soft Mute will be active. The volume will be set to 50.0 even if the fixed/variable button is in Fixed mode. The selected input is on the left of the display and the volume is on the right. The volume level will automatically ramp down and up during this selection process

Input Selection Mode:

Briefly press the control knob and the input on the left of the display will be highlighted. Rotate the control knob to scroll to the desired input. Inputs are indicated as: AES, SP1 (SPDIF1), SP2 (SPDIF2), OPT (TOSLINK), USB (24/96 USB Input with Galvanic Isolation) and ANLG (Analog Input).

Variable Output Mode:

The DAC2.7 Variable Output operating mode, selected from the rear panel Fixed/Variable output switch, allows you to change volume level by rotating the knob or via the supplied remote control.

To adjust the volume, press the knob until the volume number on the right of the display is highlighted.

The volume down function (counter-clockwise rotation) is very rapid and allows quick changes in the volume level. Volume up (clockwise rotation) functions rapidly up to a displayed volume level of 65.0. Volume is adjustable from 0.0 to 100.0 by increments of 0.5.

Fixed Output Operating Mode:

Pressing the rear panel Fixed/Variable Output switch to the in position will set the DAC2.7 in a fixed output operating mode. This mode is used when driving an analog preamp or integrated amplifier input. The volume control function is then provided by the associated preamplifier or integrated amplifier.

To use the Fixed Ouput mode set the ouput level to 100.0 for a 2.25Vrms maximum level from the RCA outputs or 4.5Vrms level for the Balanced XLR outputs. If you want the outputs set for a lower level then set the volume control to a lower level. For example, for about 2 Vrms out from the balanced outputs set the volume control to 93.5. When the level is set then press the rear panel Fixed/Variable Output button. The front panel display will now show the selected input. Rotating the knob will scroll to different inputs and the Volume and Mute functions on the remote will not function.

Front Panel Digital Lock Indicator:

When no digital input signal is present on an input, LOS (Loss Of Signal) will appear on the display. If this occurs you need to check that the correct input is selected and then check that the digital source is connected, active and functioning correctly.

The DAC2.7 Remote Control has a comprehensive set of control features that are not available on the front panel, including expanded programmability.

To access all DAC2.7 control features press the button marked DAC towards the bottom of the remote control. (The Main CD controls will still operate in the DAC, PRE and Tuner modes.)

PGM: Enter program mode. Here you can assign a four character name to each input, turn each input ON or OFF, and/or activate Home Theater Bypass for the Analog Input.

PGM key launches PROGRAM MODE

LEFT and RIGHT keys NAVIGATE

UP and DOWN keys CHANGE VALUES

CENTER key serves as ENTER

Use the four directional keys at the top of the remote to navigate programming options. Make your selection by pressing the ENTER key.

After selecting YES when entering program mode, you can name any or all inputs. Use the LEFT or RIGHT arrow to select the input to name. Press ENTER. Use the right key to select one of four characters to modify. You can quickly scroll through the characters (A-Z, 0-9, or blank) using the UP and DOWN arrows. After finishing naming the selected input, press ENTER.

Before or after naming an input, you can turn an input ON or OFF by using the UP and DOWN buttons to select ON or OFF and then pressing ENTER.

When on the ANALOG input, you can also choose Home Theatre Bypass (HTB), ON, or OFF. If you use HTB, the analog input simply passes signal through with a fixed output level. Note that this disables the volume control and requires that the volume control on the Home Theater processor be used. **Use this feature only with a volume controlled line level source. Using this with the fixed output of a CD player, for example, could result in damage to the amplifier or loudspeaker!**

When you wish to exit Program mode, simply press the PGM button. You will then be prompted to save your changes. Toggle between YES and NO and then hit ENTER.

 To restore Factory Default settings: Hold in the Control Knob while powering up the DAC2.7, and continue to hold until the display finishes its startup sequence.

VOL+: Increases the volume setting in Variable Output mode. This will Punch Through to any Bel Canto unit in Variable Output mode. The display will show the volume level while changing.

VOL-: Decreases the volume setting in Variable Output mode. This will Punch Through to any Bel Canto unit in Variable Output mode. The display will show the volume level while changing.

CH/SCAN+: This will toggle the input selection up in number and wrap around. Note that the first press of this control will show the active input selection.

CH/SCAN-: This will toggle the input selection down in number and wrap around. Note that the first press of this control will show the active input selection.

Remote Control

Display: Toggles through several display options:

1. Standard: displays selected Input on the left and Volume on the right.

2. Sample Rate: displays selected sample rate. Regardless of the display mode you are in, this display will appear whenever your source changes sample rate:

Phase: Invert the phase. If enabled, you will see a dash to the left of the volume.

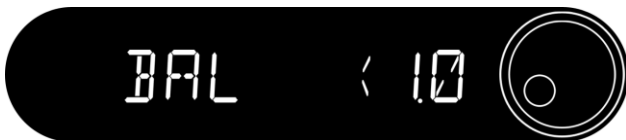When both Balance and Phase shift are in effect, you will see this:

3. Product Name
4. Software Version *see page 6 for image*
5. Display Off: Using the remote or using the control knob will turn the display back on for 3 seconds.

Mute: When in variable output mode this will switch the analog outputs from Soft to Hard Mute and Un-muted modes. Soft Mute is indicated by the word SOFT overwritten on the volume level display. Hard mute over-writes the level display with MUTE. The Mute function will Punch Through to any Bel Canto unit set in Variable Output mode.

Number Buttons: Use for direct input selection.
1: AES *2:* SPDIF1 *3:* SPDIF2 *4:* TOSLINK
5: USB *6.* Analog Input

Bal L/ Bal R: Shift the balance up to 6.0 dB towards either channel in increments of 0.5 dB. If the balance is activated, an arrow will appear on the display. It will point towards the direction in which the balance is shifted

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Using Headphones

When headphones are inserted into the headphone jack, the volume can be adjusted via the control knob or remote regardless of whether the DAC2.7 is in Fixed or Variable mode. The input can be selected as normal from the front panel or remote. The main outputs of the DAC2.7 are disabled when headphones are in use.

Output Connections

We strongly recommend that you use the Balanced XLR output to drive your e.One amplifier. Because of the DC coupled nature of the DAC2.7 there is a small residual DC offset on the outputs. This is typically less than 10mV (0.01 Volts) and will not be a problem for any Bel Canto amplifier or any vacuum tube or solid state amplifier with AC coupling or DC servo control. If desired, there is no problem connecting the DAC2.7 to an additional preamp. If using a Bel Canto preamp there will be no small click or pop when selecting the input. Other preamplifiers that do not ramp the volume up or down may produce a small click when selecting the DAC2.7 input.

Power Up

We recommend leaving the DAC2.7 powered on at all times as it benefits the overall sound quality and draws little power. If your system will not be used for an extended period of time, such as two weeks, or if there is an imminent electrical storm, we recommend shutting off your system.

Connection to a Computer

The USB port can be used for up to 24/192 data, enough for any CD source. When connecting to a PC, you will require a USB2.0 driver from www.belcantodesign.com. The USB connection works natively in OSX. For more details on optimizing computer audio sources please refer to our on-line guide at: www.belcantodesign.com

What to do if there is hum or ground noise

The design of the DAC2.7 greatly reduces the chance for ground loop induced hum and noise. We recommend using the balanced outputs for best performance-the balanced outputs can drive long lines to 10 meter length.

Connect all power cables of the audio system to a common outlet box or power conditioner unit. Having the audio system components share a common ground will greatly reduce the possibility for ground current noise being introduced into the audio signal path.

Volume Control Punch Through

The Volume Up, Down and Mute functions on the remote control will affect any Bel Canto unit in Variable Output mode regardless of whether PRE, DAC, CD or TUNER is selected. It is recommended that only the device with volume control closest to the power amps be in Variable Output mode. Any other devices that are capable of volume control should be in Fixed Volume mode.

Specifications

Digital Section:

    Maximum Input Data Rate:

    24bit Data at 192Ks/s: AES 110ohm XLR, SPDIF 75ohm, TOSLINK, USB

    Master Clock noise: 0.07 picoseconds RMS

Analog 24/192 DAC Section:

    Maximum Output: 4.5Vrms balanced XLR, 2.25Vrms RCA

    Output Impedance: 200 ohms balanced XLR, 100 ohms RCA

    Frequency Response: 20 Hz-20KHz, +/- 0.5dB

    THD+N: <0.001%, 1KHz

    Output Noise: 3.3uVrms, A-weighted 20Hz-20KHz

    Dynamic Range: 124dB, A-weighted 20Hz-20KHz

Analog 24/192 ADC Section:

    Maximum Input: 2.5Vrms RCA

    Input Impedance: 12K ohms RCA

    Frequency Response: 20 Hz-20KHz, +/- 0.5dB

    THD+N: 0.003%, 2.5Vrms in, 1KHz

    Dynamic Range: 110dB, A-weighted 20Hz-20KHz

Headphone Amplifier:

    Maximum Output: 4.5VRMS, 300mA

    THD+N: 0.0015% 1KHz

    Output Noise: 3.3uVrms, A-weighted 20Hz-20KHz

General:

    Power Usage On: 8W

    Power Usage Off: 0.0W

    Internally Set Operating Voltages: 100-120VAC or 230-240VAC 50/60 Hz

    Dimensions: 8.5" W x 12.5" D x 3.5" H (216 mm x 318 mm x 88 mm)

    Weight: 14lbs. (6.5 kg)

Features and specifications are subject to improvements and changes without prior notice.

Application of Council Directive(s):
2004/108/EC and 2006/95/EC, as amended

Standard(s) to Which Conformity Is Declared:
EN 55013:2001 + A1:2003 + A2:2006
EN 55020:2007
EN 61000-3-2:2006
EN 61000-3-3:1995 + A1:2001 + A2:2005
EN 60065:2002/A12:2011

Manufacturer:
Bel Canto Design, Ltd.
221 1st Street North
Minneapolis, MN 55401 USA

The equipment identified here conforms to the Directive(s) and
Standard(s) specified above.

Type of Equipment: Digital to Analog Converter
Models: DAC2.7
Date: January, 2014

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