Zen 24/192 DAC

Coax, Optical, USB inputs
Auto up-sampling of all inputs and all sample rates to 24 bit 192 kHz
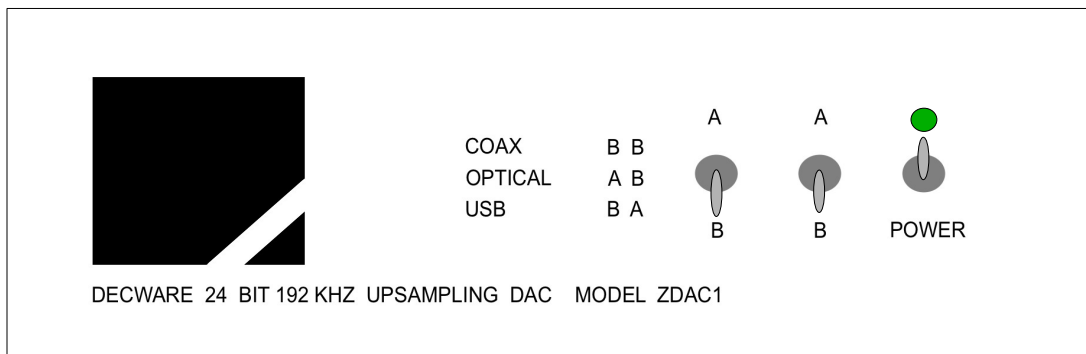
DECWARE OWNERS MANUAL   –   *MODEL* ZDAC-1

FRONT PANEL CONTROLS

The ZDAC features an on/off switch with silver contacts. It is the far right location of the three switches. There is a green LED located above it that will light when the unit is powered ON. This is a diffused LED with the brightness carefully set. Nothing worse than an obnoxiously bright LED on the front of an audio component!

The remaining two switches are used in combinations to select the desired input. Setting the left switch to A and the adjacent switch to B will tell the DAC to use the Optical input cable. Setting both switches to B will select the COAX input. USB is selected when the left switch is set to B and the adjacent switch to A.

You can for example switch from Optical to Coax by simply changing the left switch from A to B while you are listening to music ("on the fly") without worries. Similarly you can change from Coax to USB by simply changing the adjacent switch from B to A! You get the idea.

COAX	B B
OPTICAL	A B
USB	B A

A   A

B   B   POWER

DECWARE 24 BIT 192 KHZ UPSAMPLING DAC   MODEL ZDAC1

Locations and function of front controls

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REAR PANEL CONNECTIONS

Starting at the left is a fused IEC connector of the absolute highest quality. It's the real deal, not some Chinese gold plated piece of crap being sold as high-end audiophile IEC's. Good cables make a big difference including the power cord. We couldn't recommend a high-end power cord in good conscience knowing it was plugged into the all too common two dollar IEC connector. Is this component worthy of a $1000.00 power cord? Yes, it is but if you don't want to pay that much for it, buy ours.

To the right of the IEC connector is the COAX/digital input jack. A single gold plated RCA jack. Experimenting with different digital interconnects will have big rewards.

Next in line is the Optical/digital input jack. It's a small square opening with a removable plug to keep dust out when not in use. Use fiberoptic cables for this input.

Locations and function of rear jacks

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REAR PANEL CONNECTIONS (continued)

Finally on the right, the large square jack with the green LED next to it, is a standard USB jack, compatible will both 1.0 and 2.0 USB standards and will work on all PC and MAC computers. The ZDAC-1 is plug and play, no drivers are needed or installed on your computer. When the USB cable is plugged into the ZDAC and your computer is ON the green LED will light showing you that the connection is solid.

And finally below the USB input jack are your LEFT and RIGHT analogue output jacks. These are gold plated RCA jacks with Teflon insulators and are made in Japan. We have used over 20,000 of these jacks over the past 15 years with zero problems.

The RCA output jacks have a very small band near the chassis with either black or red paint inside. Black is the left channel and Red is the right channel.

GENERAL DESCRIPTION

The ZDAC-1 is an audiophile implementation Cirrus Logic's flagship 192kHz multi-bit CS4398 DAC Chip. It features Coax, Optical and USB inputs via a digital receiver with 32kHz~192kHz sample frequency range and low-jitter clock recovery.   All three inputs, including USB are up-sampled to 24-bit/192kHz and are selectable from the front switches. The output stage features high grade op amps that have been carefully voiced for each channel to handle the I/V conversion from the DAC chip to the dual-mono buffer stage for a nice low output impedance.

START-UP

Inspect your ZDAC-1 for any visual sings of damage. If the unit has been damaged, keep the packing container it came in as the shipper will require it to process the claim.

USB Operation

There are no drivers required for USB operation. When you plug the ZDAC-1 into your computer with a USB cable, your computer will automatically find it and use it in place of it's own sound card. Your computer will operate as it always did, the only difference is that it will sound better! The ZDAC-1 will accept 16/44kHz, 24/96kHz and 24/192kHz files on all three inputs including USB.

Why USB?

There are a couple things to know about USB operation vs. COAX or OPTICAL. Believe it or not, the transport used to play CD's and the cable that connects it to the ZDAC-1 (or any DAC for that matter) is largely responsible for the amount of jitter the ZDAC will have to negotiate and try to remove. Jitter is one of the primary causes of compromised fidelity during CD playback. The less jitter, the better the sound quality. It is recommended that you spend as much or more on a transport as you did your DAC.

Despite the quality of your Transport and cables, your CD's will have errors. Some scuffed up CD's will have 100's of errors. Interestingly enough CD's with errors may error in different locations on the tracks each time they are played. Using programs like "Exact Audio Copy" for your PC will let you copy the contents of a CD to your computers hard drive without errors by re-reading the disk as many times as it takes to get an error free copy. If a track can not be read without errors, it is flagged. The software can compare the tracks that were copied against an online database of all redbook CD's to verify that you have a perfect error free copy of the original recording. Regrettably a transport can't do that.

Once you have an error free copy of the CD on your computers hard drive, you can use whatever software your computer presently uses to play it back. Your computer uses the USB to send the digital data to your ZDAC-1. However, Microsoft Windows and MAC will likely pass this error free data through a DSP section of the processor that will manipulate the data before it gets sent out on the USB port to your ZDAC-1. If this is going to happen, there's little sense in having error free copies of your CD's. What is needed is called "BIT for BIT" output from the error free copy on your computers hard drive directly to the ZDAC-1 and bypassing all internal manipulation.

This means you're going to need a program other than what was packaged with your computer to play back the music files you copied onto your computers hard drive. One of the first good ones to become available for audiophile use is called FOOBAR and is a free download on the internet. There are of course others. Using Exact Audio Copy to put the CD's on your computer, and Foobar to play the songs (Note volume on the computer must be set to 100%) will result in error free playback with far less jitter (almost none) than you would get from an entry-level transport.

The USB cable you choose is another consideration. In theory there is no difference between the data that comes out the end of a generic USB cable and some fancy audiophile cable at 10 or 20 times the price. The problem seems to be that the USB cable also carries power and ground to the device it's connected to. This is what makes small USB devices like memory sticks able to work without an additional power cord. (*Some cheap DACs actually use this power from the computer instead of a real discrete fully regulated power supply. They are of course a waste of time.*) Even if the DAC doesn't use any of the power from the USB cable, the ground is usually connected

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Why USB? (Continued)

creating a path between the horribly noisy computer power supply and the DAC. The noise rides on the ground path created by the cable. For this reason certain after market cables can be a benefit. We find that using a lap top computer works rather well as a music server. During critical listening sessions, the lap top can be unplugged from the wall and run off battery. This reduces the problem just described above. NOTE: The Mac Mini is our first choice for a non-battery operated computer.

For more information on software that can be used for audiophile playback, visit the ZDAC-1 support forum on our web site.

OPTICAL

The ZDAC-1 has an optical input sometimes referred to as "tosslink" that use a fiberoptic cable to connect the ZDAC-1 to the transport or other audio component such as a receiver with digital outputs.

The jack on the ZDAC-1 has a small square plug installed that must be removed before you can plug the fiberoptic cable in. This is to keep dust out of the jack. The jack contains a laser that sends light signals through the cable so dirt or dust will reduce performance*.*

Choosing an optical cable should be taken seriously. It will effect the sound quality, staging and imaging not to mention overall smoothness. We recommend glass cables for the best optical purity and hence the best sound.

COAX INPUT

The coax input on the ZDAC-1 is a single RCA type jack on the rear of the ZDAC-1. No special instructions associated with it other than the sound quality will be effected by the digital cable you use. It pays to try a few different cables.

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COAX and OPTICAL CABLES

One technique that you can use to hear the difference in cables is to use your ZDAC-1 front panel switches to change between COAX and OPTICAL. Have one of each type plugged in and you can change between them "on the fly" while the music is playing. This makes it easy to hear the difference between the two cables. If your coax cable is the better sounding of the two, than use it. Meanwhile you can start to audition better optical cables. If you find one that sounds better than the coax cable, use it instead. Now that your using your new optical cable, you can start auditioning better coax cables to see if you can find something better than your optical cable. Repeat this process as many times as you want.

BURN-IN for ZDAC-1

The ZDAC-1 is using a myriad of hi-end capacitors both in the signal path and in the power supplies. These extend the time it takes for a new ZDAC-1 to "burn-in". You can expect about 3 weeks of daily use before the unit sounds it's best. We do not recommend using fancy "burn-in" CD's to expedite the process. The burn in process is about the dielectrics in the capacitors becoming trained and the foil seating properly. If you train the caps to reproduce pink noise, triangle waves, and test tones then that is what it will sound best playing. Our recommendation is to use real music to burn in the unit.

OPERATION

The ZDAC-1 can be left on 24/7 without problems. When turned on from a cold state it you will notice that is seems to sound better as it warms up. This is normal and common with most good audio gear. Your ZDAC-1 will automatically select the best sampling rate for any given input at any given time. There are no user adjustments or settings other than the front mounted input select switches.

NOTE about USB:

If you have your computer on and a program playing music through your ZDAC-1 and you unplug the USB cable, the program will likely freeze. This is normal and will happen with any USB DAC or sound card. Plugging the cable back in will re-engage the DAC however the program will still not play music. You will have to quit the program and then restart it before you will hear sound from the ZDAC-1.

MAINTENANCE

Cleaning should be done with the ZDAC-1 turned OFF and at room temperature. A damp towel with alcohol is ideal for removing any smudge marks. Window cleaner also works fine.

Input jacks can also be cleaned with an alcohol soaked Q-Tip inserted into the jack and rotated. If the Q-Tip comes out with dark stains on it, your jacks were dirty. Jacks can get dirty after only a single insertion of a non-cleaned interconnect cable. Having clean connections is important. Finger oils do not help the sound.

Products like Caig DeOxit, ProGold and other contact cleaners/enhancers can also be used as a part of a regular maintenance program. The inside of the ZDAC-1 should not need cleaning as the chassis for this amp is sealed to keep dust and smoke out of the inside of the amplifier. Do not remove the bottom cover.

FUSE

There is a 2 amp fuse located in the IEC connector for the power cord. It is integrated into the jack itself and is hard to see that you can pry a small square door open and find the fuse inside.

POWER CORDS and CONDITIONING

Upgraded power cords can and do make a difference when the overall strength of the audio chain begins to show a stfock power cord as the weak link. We hear nice improvements with the use of silver/Teflon DHC-1 power cords.

SERVICE and REPAIR

Your ZDAC-1 is covered by a one year parts and labor warranty to the original owner. Should it ever need repair or you just want it checked, contact us or fill out the RA form on our web site and include it with your unitf when you ship. We'll contact you after it has arrived and let you know what we've found and determine exactly what caused it.

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GETTING THE MOST FROM YOUR ZDAC-1

If you're not getting the sound you're after or grow tired of your ZDAC-1 please feel free to contact us. Talk to Steve (the designer) directly. He is always pleased to offer some free consulting in the interest of making your stereo sound better. The advise is always honest even if it means recommending someone else's gear.

There are also over 100 articles written on the web site to this effect and active support forums for you to meet like minded audiophiles and share experiences.

SPEAKERS and AMPLIFIERS

If the day comes when you want to further improve the sound of your stereo and a more expensive DAC seems like a good thing to try, ask yourself how your amplifier rates against all the best sounding amplifiers in the world... If it's not in the top 10% then it's possible your amp is not letting you hear the true picture coming from your ZDAC-1 and trying different DAC's may yield minimal changes. Consider a Decware amplifier if this is the case and you'll be able to hear the full potential of the ZDAC-1! This is going to be true regardless of what speakers you have. Yes, speakers will make an obvious difference, however the imaging, transparency, control, dynamics, detail, etc, all comes from the amplifier so getting better speakers instead of a better amplifier is usually an all too common mistake.

SPECIFICATIONS

Dimensions: 2.5" high (with feet) x 6" wide x 10.5" deep
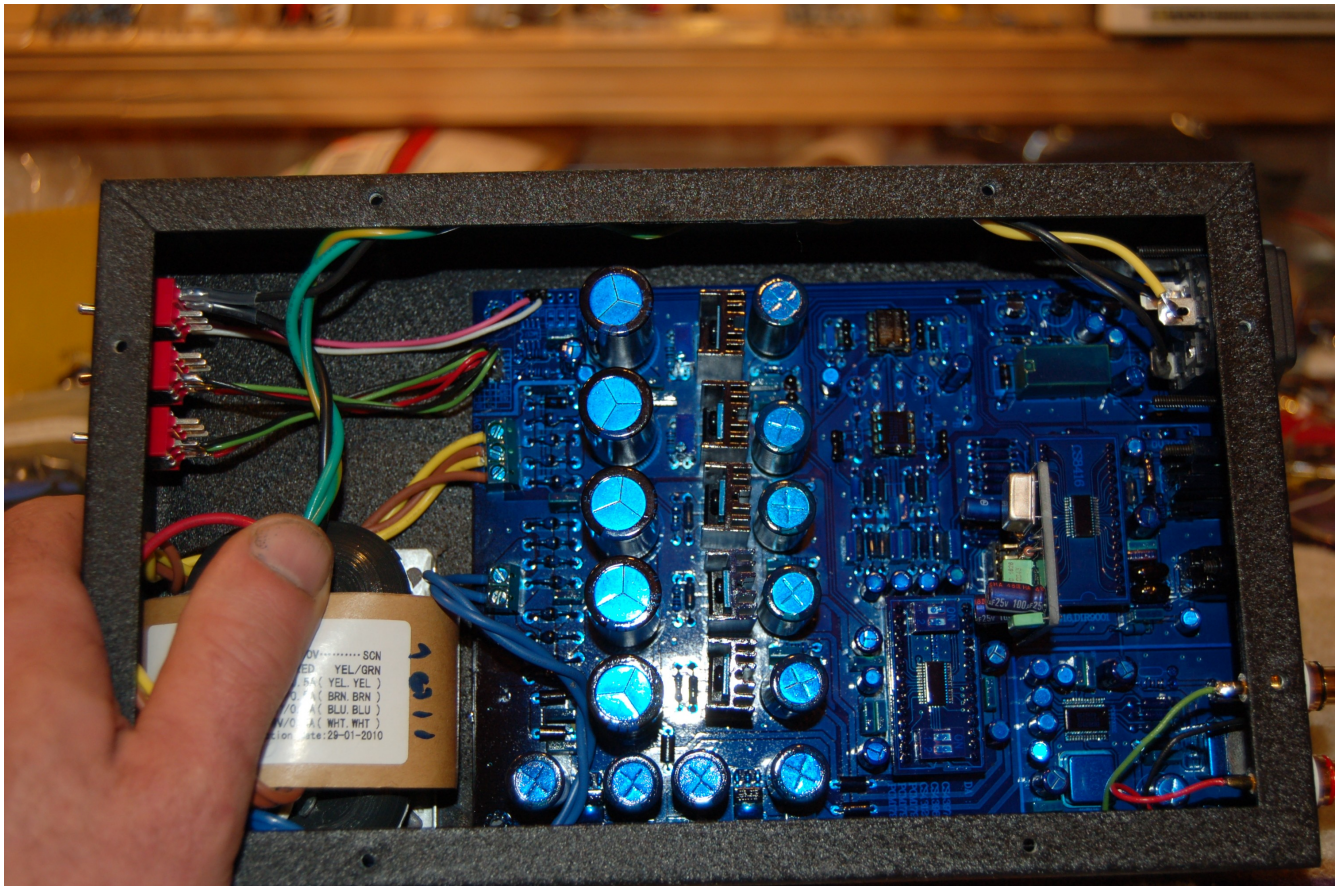*Weight: 7 lbs.*
Output: 1.8 volts
Output Impedance: less than 100 ohms
Noise/Hum: -107dB
Frequency response: 20Hz ~ 20kHz

UPGRADING

There is nothing inside your ZDAC-1 that needs or can be updated. Every resistor and capacitor including electrolytics are audiophile grade. The output stage has hand selected op amps by Linear Technologies and Burr Brown. The crystals are precision grade and the power supply uses fast recovery diodes, and five individually regulated supplies, one for each chip. Really there is nothing left that can be done.

However, the ZDAC-1 has been designed with some expandability in mind. This is of particular interest if you are running the ZDAC-1 directly into an amplifier without using a preamp. A tube output stage can transform the sound of a good DAC rather dramatically. It also has the big advantage of being able to be voiced by trying different tubes, thus taking things to a more personal level.

UPGRADING (continued)

The ZDAC-1 has been designed with two companion products in mind. A matching tube gain stage and a matching tube buffer stage. The tube gain stage will add additional depth and dynamics to the sound and if a good tube preamp is not being used, makes a big difference. The tube buffer stage creates a lower output impedance to better drive solid state amplifiers and or longer cable runs without high frequency attenuation. In this case the tube buffer stage is our well loved ZBOX, which has an amazing ability to take digital sound a step closer to analogue by relaxing the music and improving the overall timing and phase.

You can find out more about these products on the web site and check this owner's manual from time to time as it will probably be updated with instructions on how to hook everything together.

LISTENING

This dac, evaluated on high efficiency speakers and reference electrostatics strikes what we feel is the perfect balance between detail and musicality without fatigue. All you have to do is close your eyes and enjoy the music!