



Anedio

D1 DAC (Digital-to-Analog Converter) with Volume Control

Operating Manual



Welcome

Thank you for purchasing the Anedio D1 DAC!

Anedio is founded upon the principle that the enjoyment of highest-quality music should be available for everyone, not just for the esoteric few. Our quest is to attain the most realistic and faithful reproduction of music, enabling the listener to experience its beauty, pathos, joy, and delight more fully. At the same time, we strive to make our products affordable by focusing on the essentials and using the most cost-effective technologies. The result, we believe, is a unique combination of sonic excellence and superb value.

At the center of the Anedio D1 is the ES9018 Sabre Reference 32-bit DAC from ESS Technologies. Its oversampling modulator, optimized for accurate reproduction of music, excels at maintaining superb linearity at all levels, tracking fast transients, and resolving lowermost signals. You will be able to hear minute details, accurate rendition of instrumental timbres, and spacial cues from reverberations.

The D1 DAC incorporates multi-stage jitter reduction circuits to tame jitter as far as possible, well below the threshold of audibility. As the digital signal goes through each stage, the jitter level is progressively reduced until the critical final stage, which is driven by an ultra-low jitter oscillator with 0.5 ps rms jitter. Whether you listen to music through USB or SPDIF, the multi-stage jitter reduction is highly effective, delivering consistently natural, musical, and relaxed sound.

The built-in volume control allows power amplifiers to be connected directly to the D1 DAC, eliminating the preamp in the signal path when playing from a digital source. Bypassing the preamp is one of the most significant steps toward a higher level of transparency. To ensure highest signal-to-noise ratios at realistic listening levels, our design uses an optimal combination of 32-bit digital attenuators and thin-film resistor dividers.

All the performance and quality are made available at an affordable price by using highly-efficient manufacturing technologies and by incorporating cost-reduction measures from the very beginning of the design process.

We hope you will experience many years of joy and pleasure in listening to music.

Important Safety Instructions



The lightning symbol within an equilateral triangle is intended to alert the user to the presence of un-insulated dangerous voltage within the product's enclosure that may constitute a risk of electric shock.



The exclamation mark within an equilateral triangle is intended to alert the user to important operating and maintenance instructions.

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.

14. 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 is 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.



WARNING: To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture. The apparatus shall not be exposed to dripping or splashing, and no objects filled with liquids, such as vases, shall be placed on the apparatus.

To completely disconnect this equipment 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 operable.

Setting Up

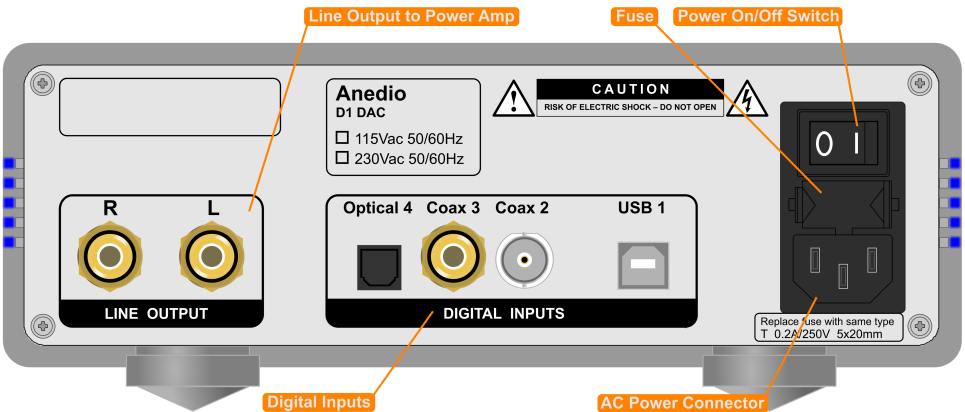
Package Contents

- Model D1 DAC
- AC Power Cord
- IR Remote Control
- Extra Fuses
- User Manual
- Measurements of Each Unit

Front Panel



Rear Panel



Placement of the D1 DAC

If you are using the D1 DAC primarily to listen to music through loudspeakers (instead of headphones), place the DAC and the amplifier *between the two loudspeakers*, instead of setting it off to one side. This keeps the lengths of interconnects and speaker cables short for optimal sonic performance.

Remember that the ideal cable is no cable. *The signal can never be improved by going through a longer cable.* As you shorten the cable length, the signal fidelity approaches that of the ideal cable. The best practice, therefore, is to keep the cables as short as possible by placing the DAC and the amplifier between the loudspeakers.

Bypassing the Preamp

If all your music sources are digital, you do not need a preamp. The built-in volume control allows power amplifiers to be connected directly to the D1 DAC. *Bypassing the preamp is one of the most significant steps toward a higher level of transparency.* To ensure highest signal-to-noise ratios at realistic listening levels, our design uses an optimal combination of 32-bit digital attenuators and thin-film resistor dividers.

Connecting Interconnects and Cables



Before connecting, turn off the power to all the components in your system.

Digital Inputs: The D1 DAC accepts four digital inputs, all of which are galvanically isolated for excellent immunity to ground loop noise.

Channel 1 — USB (16 bits, 44.1K, 48KHz)

Channel 2 — SPDIF, 75-ohm BNC
(24 bits, 44.1K, 48K, 88.2K, 96K, 176.4K, 192KHz)

Channel 3 — SPDIF, 75-ohm RCA
(24 bits, 44.1K, 48K, 88.2K, 96K, 176.4K, 192KHz)

Channel 4 — Toslink, Optical
(24 bits, 44.1K, 48K, 88.2K, 96KHz)

Line Output: Connect the left and right channels to a power amplifier using a pair of RCA interconnects.

Extravagant interconnects with exotic materials are unnecessary. Two characteristics, however, are important: (a) low shield (outer conductor) resistance; (b) robust mechanical design for reliable electrical contact. The shorter the cable, the more transparent your system will be.

Plug-and-Play USB Interface

The D1 DAC is a plug-and-play USB device. There is no need to install a USB driver. Simply plug the USB input of the DAC into the USB port of a computer, and you can enjoy listening to music immediately.

Connecting Power Cord

For the lowest ground noise and hum, it is highly recommended that the power cords of all components be connected to *a single point* — usually a single surge protector with multiple outlets. This keeps all components referenced to a single point, as far as it is practically possible, thus minimizing the differences in ground potentials among the components.



Never use a 3-prong-to-2-prong adapter to fix a ground loop problem. This will disable the safety earth ground and may cause electric shocks.

Isolating Cable TV Ground

If you have a cable TV connected to your audio system, ensure that the cable ground is galvanically isolated from the audio ground. The cable TV ground, tied to the earth outside your home, is at a significantly different potential and can cause audible hum if it is not isolated properly. If you suspect this is the case, insert a cable TV ground isolator *inside your home*, just before your cable set-top box or TV RF input.

Surge Protectors

A surge protector is strongly recommended so that the components are protected from large power line spikes, which can occur, for instance, from lightning strikes.

Power Switch

The power switch is located in the back panel. Toggle the switch to

the “1” position to turn power on. To turn power off, toggle the switch to the “0” position.



When turning on and off your music system with a power amplifier, the power amplifier should be the last component to be turned on and the first component to be turned off. This prevents power on/off transients from being transmitted to loudspeakers.

Lock/Unlock Indicator LEDs

The **green** LED light just above the volume display indicates that the DAC is properly locked to the incoming data. The **red** LED indicates that the DAC is unlocked due to the absence of valid data.

Using the D1 DAC

Remote Control

The D1 DAC works with the Sony RM-EZ4 Universal Remote, which was chosen for its ergonomic design. Its large buttons, easily visible and intelligently placed, make it particularly suitable for controlling the volume level.

Only those remote keys described in the manual are functional.

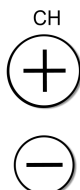


For use with the D1 DAC, select the “CBL/SAT” mode.

CBL/SAT

Channel Selection

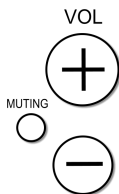
The channel can be set either by pressing the channel button on the front panel or by pressing the channel +/- button on the remote control.



When selected, the channel number is displayed momentarily (e.g., “C2” for Channel 2).

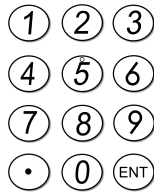
Volume Control

The volume level can be set either by turning the volume knob or by pressing the volume +/- button on the remote control.



Holding down the volume +/- button will continually increase or decrease the volume level.

The numeric keys on the remote control can also be used to set the volume level. Simply key in the volume level, followed by the “ENT” key.



The volume level changes in steps of 0.5 dB. The maximum level, 0 dB, is displayed as “99”. For example, “59” on the display means that the volume level is -20 dB from the maximum.

Safe Volume Level

At power on, the volume level is limited to a safe level (“81” on the display) in order to prevent accidental damages to loudspeakers or headphones.

To prevent entering high volume levels accidentally, the level above “81” cannot be entered directly from the numeric keys, but only by turning the volume knob or by pressing the volume + key.

As you change the volume from “81” to “82”, you will hear a relay click. The D1 DAC uses an optimal combination of 32-bit digital attenuators and relay-controlled thin-film resistor dividers in order to ensure highest signal-to-noise ratios at realistic listening levels,

Mute (Remote Control Only)

The sound can be muted by pressing the “MUTING” button on the remote control. Pressing the “MUTING” button again restores the previous volume level.

Using Another Universal Remote Control

As with most people, we do not like to pile up remote controls in our living rooms. In case you want to use another universal remote to control the D1 DAC, we’ve made it easy to do so by using a common IR protocol that is readily recognized by most universal remote controls. Simply follow the learning instruction for the universal remote of your choice, and you will be ready to control the D1 DAC within minutes.

Specifications

D/A Converter IC:	ESS Technology ES9018 Sabre Reference 32-bit DAC
Sample Rates:	44.1K-192KHz
Total Harmonic Distortion + Noise:	0.0003% @ 1KHz, 0dBFS 0.0003% @ 20KHz, 0dBFS
Intermodulation Distortion:	0.00015% @ 19KHz + 20KHz, 0 dBFS 2nd order IMD
Signal-to-Noise Ratio:	124 dB, 20Hz-20KHz BW, 2 Vrms 126 dB, A-weighted, 2 Vrms
DAC Master Clock Jitter:	0.5 ps rms
Total Jitter at DAC Output:	Refer to “Measuring Jitter” on Anedio web site
Frequency Response:	20 Hz - 20 KHz (-0.15dB)
Phase:	Non-inverting
Channel Separation:	130 dB @ 1KHz 120 dB @ 20KHz
Digital Inputs:	USB, SPDIF 75-ohm BNC, SPDIF 75-ohm RCA, Toslink optical
Digital Input Resolution and Sample Rate:	USB: 16 bits, 44.1K, 48KHz SPDIF 75-ohm BNC: 24 bits 44.1K, 48K, 88.2K, 96K, 176.4K, 192KHz SPDIF 75-ohm RCA: 24 bits 44.1K, 48K, 88.2K, 96K, 176.4K, 192KHz Toslink Optical: 24 bits 44.1K, 48K, 88.2K, 96KHz
USB Operating System Requirement:	Windows 7, Vista, XP. Apple Mac OS X
Digital Volume Control Steps:	0.5 dB
Volume Matching between Channels:	Better than 0.1 dB
Line Output:	Single-ended, RCA jacks with gold-plated contacts and teflon dielectric
Line Output Level:	2.0 Vrms (unbalanced)
Line Output Impedance:	75 ohms
Line Output Offset:	5 mV max

Headphone Amp Current Output:	250 mA peak
Headphone Amp Output Impedance:	0.25 ohm, 20-20KHz
Headphone Amp THD+N:	0.0004%, 2Vrms into 60 ohms
Headphone Jack:	1/4" TRS
Power Consumption:	8 W
Dimensions (W x H x D):	9.0 x 3.4 x 13.0 inches (229 x 86 x 330 mm)
Weight:	8 lbs (3.6 Kg)

FCC Compliance

This equipment has been tested by MET Laboratories, Inc. and found to comply with the requirements of Title 47 of the Code of Federal Regulations (CFR), Part 15 Subpart B for a Class B Digital Device.

Trouble Shooting

Symptoms	Remedy
No power	<ul style="list-style-type: none"> • Ensure the power cord is plugged in fully. • Check the fuse. If blown, ensure that the outputs are not shorted. Replace it only with 0.2A/250V 5x20mm Time-lag (slow-blo). Using an incorrect fuse will void the warranty.
Power on but no sound	<ul style="list-style-type: none"> • Ensure that the correct channel is selected. • Ensure that the source component is turned on. • Ensure that the D1 DAC is not muted, indicated by “o” on the volume display. • Ensure that the power amplifier is turned on. • Ensure that the interconnects and cables are plugged in fully and seated properly. • If the above steps do not solve the problem, recycle power by turning off the D1 DAC, waiting 10 seconds, and turning it back on.
No sound through USB (Ch 1)	<ul style="list-style-type: none"> • In your media player, ensure that “USB Audio DAC” is selected as the device for playback.
Hum	<ul style="list-style-type: none"> • Ensure that all components are connected to a single power strip. • If there is a cable TV or antenna connection, ensure that the cable/antenna grounds are galvanically isolated from the audio ground. This may require inserting a ground isolator.
Diffused stereo imaging	<ul style="list-style-type: none"> • Ensure that the loudspeaker phase is not inverted.

If the problem persists, please contact Anedio via the Contact page at www.anedio.com.



WARNING: Repairs are to be performed by qualified service personnel only. To reduce the risk of electric shock, do not perform any servicing other than that contained in the operating instructions.

Warranty & Repair

One-Year Limited Warranty

Anedio warrants this product to be free from defects in materials and workmanship, subject to the terms set forth below, for periods up to one year from the date of original purchase. The warranty includes parts and labor.

Anedio will remedy the problem by repair or replacement, as we deem necessary, to restore the product to full performance. Anedio will pay the shipping cost one way (the return portion).

This warranty does not cover cosmetic damage or damage due to accident, misuse, abuse, negligence while in the possession of the customer.

Tampering by persons other than factory-authorized service personnel or failure to fully comply with the operating instructions specified in the manual will void the warranty. Any unauthorized disassembly, component replacement, or modifications performed to the product will void the warranty.

The warranty is transferable from the original owner to a subsequent owner as long as a copy of the bill-of-sale from Anedio accompanies the re-sale.

Repair

In the event of a defect or malfunction, contact Anedio for return authorization (via the Contact page at www.anedio.com). Unauthorized returns will not be accepted.

Products must be returned using *original packaging material only*. Anedio is not responsible for damages incurred during transit if the original factory packaging is not used. The packaging material may be purchased from Anedio if necessary.