

# Audioengine D2 Wireless 24-Bit DAC & USB-S/PDIF Converter

<http://www.audiostream.com/content/audioengine-d1-wireless-24-bit-dac-usb-spdif-converter>

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Device Type: Wireless Digital to Analog Converter and Wireless USB-S/PDIF Converter

Input (D2 Sender): (1) S/PDIF TosLink, (1) USB

Output (D2 Receiver): (1) pair RCA, (1) S/PDIF Toslink

Dimensions: 4.75 x 5.5 x 1"

Weight: 4lbs (2.0kg)

Included Accessories: 2 ft. USB cable, 2 Power adapters with detachable AC cords, 2 Microfiber bags, and a 6.5 ft. RCA cable

Availability: Online and through Authorized Dealers

Price: \$599.00

Website: [audioengineusa.com](http://audioengineusa.com)

*Dear Abby: My computer is over here while my hi-fi is way over there. It's too far for wires so I need something that'll send the music that's on my computer over to my hi-fi without any. And some of my music is high definition 24-bit/96kHz and I don't want it downsampled, resampled or converted. I want to send and play it in its native resolution along with all of my other resolutions right down to 16/44 and even the occasional 320k MP3 (you know the free streaming stuff). What's a high rez-lovin*

computer audio diggin gal to do?

Dear high rez-lovin computer audio diggin gal,  
The Audioengine D2 wireless DAC will do what you ask, sending your music up to 24/96 in tact and up to 100ft. away. In my house I was getting clean transmission up to around 60ft. The better news is this wireless convenience does not come at any real sonic cost. So the real question is, will you like the sound of the D2's DAC? And only you can answer that question.

Abby

[I wanted to play out the fantasy of a Dear Abby-like hi-fi review and it felt, nice]

### Getting High (definition) Without Wires

The Audioengine D2 DAC is one of a new and few breed of wireless DACs capable of sending, receiving, and playing high definition music up to 24-bit/96kHz. As a matter of fact, I know of no other wireless DAC that'll do the same, today. Of course there are loads of UPnP streamers out there that include wireless capabilities but I'm talking about just-a-DAC with 24/96 wireless capabilities built-in (i.e. no dongle needed). One basic difference is wireless DACs are file format agnostic whereas streamers are not. They're more picky. And most streamers piggyback on your existing wi-fi network whereas the D2 provides its own.

Then there's the [Apple Camera Connection Kit](#) (\$29) that lets you use your iPad as a 24/96 wireless receiver. But you still need your own external DAC (the CCK will only work with certain DACs and I've yet to find a



comprehensive list), an iPad (of course), and an existing home wi-fi network to go down this road.

So, if you want a 24/96 wireless DAC today, and one that will work with your Mac or PC and one that does not require an existing home wi-fi network to work, the Audioengine D2 is your first and last choice. If you want a 24/96 wireless USB-S/PDIF converter because you already own a DAC whose voice you love but it needs to sit by your hi-fi which is too far away from your computer for wires, the Audioengine D2 is your first and last choice, today [footnote 1].

## How Do They Do It?

In terms of the wireless piece, I'll let Audioengine tell their story:

*The D2 system divides the band between 2405 MHz and 2477 MHz into 37 discrete, 2 MHz wide channels. Channels numbered 2 through 38 inclusive are used for system operation. The system scans the spectrum and selects two channels that are 18 channels (or 36 mHz) apart and transmits with 50% of the time on one channel (for example channel 2) and 50% on the other channel (for example channel 20). The system stays on these selected channels until the error detection rate reaches a pre-determined level indicating deteriorating RF conditions. The system will then select a cleaner channel for transmission and move there without any drop in audio. In this way the D2 not only maintains it's own audio integrity, but co-exists nicely with other LAN devices.*

I can vouch for that last part as the D2 did not interfere with my home wi-fi network at all.

The D2 uses the Burr Brown PCM1792A DAC, an Asahi Kasei AK4117 optical receiver for Toslink, and just like the [Audioengine D1 DAC](#) the TI1020B USB controller. Also just like the D1 DAC, the D2 Sender is of the Adaptive mode USB variety. But, and its a big but, since the D2 takes that Adaptive mode USB input and transmits it wirelessly, the D2 Receiver sees the incoming data as...let me refer to the Audioengine website:

*Is the D2 USB isochronous or asynchronous?*

*The D2 uses "adaptive mode" in it's USB receiver. This means that the USB receiver (Texas Instruments 1020B) will keep track of the data coming in from the computer and adjust so as not to miss any incoming data. Due to the nature of the wireless link, the data then becomes asynchronous before arriving at the Receiver. Thus the D2 acts as an asynchronous USB DAC with the added benefit of being 24/96 bit-perfect wireless.*

Just to clarify, you could also put the first part this way, "The D2's Sender uses "adaptive mode" in it's USB receiver (Texas Instruments 1020B). This means that the Sender will keep track of the data coming in from the computer and adjust so as not to miss any incoming data..." This way there's no confusion between a "USB receiver" and "the Receiver". It's also worth reiterating that the asynchronous communication referred to is not strictly speaking related to the USB DAC in the D2's Receiver. Rather its an aspect of the wireless communication between the Sender and Receiver. But what really matters is how it sounds.

## Music Over the Airwaves

Working with the Audioengine D2 wireless DAC is really a plug it in and play your



music kinda deal. I used the Sender mainly connected to my iMac via USB with the Receiver connected to my hi-fi with Shindo



interconnects. You can power the Sender via USB or the included power cord. The Receiver needs to be plugged in using its included detachable AC cord. One thing to note is if you plan to use the Toslink connection on the Sender, I used it this way with my MacBook Pro, the USB port becomes power-only if connected. In other words, the Toslink connection takes precedence over USB when both are connected. Audioengine states the wireless range to be typically up to 100ft. and I found, using my usual scientific method of walking around the house with the D2 Sender connected to my MacBook Pro playing music, I could get around 60ft. away before the signal began to drop out.

If you check out the Specifications for the D2, you'll also notice this about the Toslink input, "Input data rate: up to 192KS/s (optical)". I clarified this point with Brady Bargaquist of Audioengine and while the D2 will play 24/192 files, they are downsampled in the Sender (as long as your hardware and media player can handle 24/192) to 24/96 before becoming airborne:

*D2 will play any file up to 192KS/s (optical) and 96KS/s (USB), however 192k files are downsampled to 96k by the Sender as that's the limit we can do over the air.*

*On the Receiver side we had the option to convert everything up to 192 at the optical output, but decided against this as noise levels were higher than we wanted (and also decided that bit-perfect 24/96 was the better feature as 24/96 is much more popular than 24/192).*

*Bottom line is that D2 down-samples 192 files as we are limited by the wireless protocol and didn't want to re-sample the stream on the D2 receiver side due to unwanted noise.*

You can connect up to three Receivers to one Sender which seems rather gregarious. Just realize that one source is controlling all three Receivers so you're not getting different "zones" capable of playing different tunes simultaneously. There's also a volume control on the Sender which I used sparingly because I'm not a volume level fiddler. Here's an interesting note on the volume control from the Audioengine website which you really should think of as a remote volume control:

*The D2 incorporates a separate-path wireless channel to transmit volume information from the Sender volume control to the analog section of the Receiver. This means that the volume information never affects the digital audio stream.*

**I Can't Believe You Made Me Wait This Long Before Telling Me How It Sounds**

Yea I know. But all of that information seemed important to cover before getting to the sound of the Audioengine D2 wireless DAC. Well?

Big bass, tight drum thwacks, gentle strings with voices in and out of the mix more or less as the recording demands. Just like its little brother the D1, I found the D2 to be plain old fun to listen to. I also feel the D2 adds a bit more resolution (inside joke from the D1



review) which adds a lighter touch to the music overall. During my time with the D2 I threw everything and anything I was in the mood to hear at it and it threw it right back with very little to complaint about.

But seeing as complaining is a part of my job I'd say the D2 is not the last word in conveying micro-detail where nuance and subtle shifts in tone and inflection are not as apparent as I've heard from other DACs. Vocal impact in particular can be more startlingly present. But I can say pretty much the same thing about other DACs that can't do wireless so I'm really talking about the quality of the sound regardless of the fact that we're talking about a \$599 24/96-capable wireless DAC. So the wireless aspect of the D2 really isn't an issue and that's really good news.

### **It's like having one's cake and eating it in another room too**

To test this theory I used the D2 as a USB-S/PDIF converter by connecting the Receiver's Toslink output to the Audioengine D1's Toslink input while its other end was connected to the Leben CS-300XS integrated amp. And I listened to music playing on my iMac sent wirelessly to the D2 > D1 > Leben. Then I connected the D1 directly to my MacBook Pro via Toslink with the output going straight into the Leben CS-300XS integrated amp and the difference was negligible. This presents another interesting scenario that's worth mentioning again—if you already have a DAC with Toslink input that you enjoy but it's too far from your computer for a wired connection, you can use the D2 as a wireless 24/96 USB-S/PDIF converter which is kinda like having your cake and eating it in another room too.

I'm fairly certain some listeners will simply be happy to have the Audioengine D2 wireless DAC. And they'll be happy to have it for its ease of use, for not having to buy bulk Ethernet cable, and for not having to get up into the attic or down into the basement in order to run cables through walls. But I imagine they'll be even happier when they just plug it in and play their music and realize the D2 wireless DAC delivers the musical goods.

Footnote 1: I realize I've gone out on a limb unnecessarily far when I could have just hedged with a handy, "To the best of my knowledge...". But I tried to find an equal, i.e. a wireless DAC that can handle up to 24/96 on its own wi-fi network and I couldn't. And I did not see or hear one at RMAF or CES (shh don't tell anyone but I'm actually using this as a ploy to see if anyone else can find another).

The closest I found so far was the AD Labs RD26 DAC which can handle up to 24/48. And here's a handy tip when trying to hunt down a high definition capable DAC whether wired or wireless—if you find it impossible to locate clearly stated specifications on a manufacturers website concerning what bit depth and sample rate their DAC can handle, odds are it doesn't do what you want it to do.

### Associated Equipment

Also on hand and in use during the X-DAC review: Audioengine D1, Wavelength Audio Proton, and the T+A MP 1260 R - DAC/Network Client