

Audioengine D2 24-bit Wireless Computer Interface Review

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Wireless audio in the home has traditionally been handcuffed by CD quality 16 bit / 44.1 kHz sound, mandatory playback software, wireless network configuration, or all three. Any one of these restrictions can be showstoppers for many users. I love the Apple AirPort Express and AppleTV wireless products but am not thrilled by the lack of high resolution audio support. On the other hand Squeezebox users love the ability to play high resolution audio but the required use of Logitech Media Server software is the elephant in the room. These obstacles, and many more, have been removed by Audioengine's D2 wireless computer interface. It's a wireless USB DAC, wireless USB to S/PDIF converter, and wireless optical S/PDIF stereo link. The D2 wireless computer interface supports up through 24 bit / 96 kHz audio, is compatible with every playback application supported by the host computer, and requires absolutely no wireless network setup. Audioengine has not only freed users from the technical prohibitions of other wireless audio devices but has also created a good sounding device in the D2 wireless computer interface.



What Is The Audioengine D2 24-bit Wireless Computer Interface?

At the most basic level Audioengine's D2 comprises a pair of devices that transport music from point A to point B wirelessly. People uninterested in the finer details can stop reading right here knowing that the D2 just plain works and does what Audioengine asserts.

On the surface the D2 consists of a wireless transmitter and receiver(s) capable of streaming high resolution audio to three separate zones. The D2 transmitter connects to an audio source by USB or optical S/PDIF. When connected to a computer via USB the transmitter can be powered from the computer. Connecting the transmitter to a computer or other music source via S/PDIF requires use of the included external power supply. The front panel contains two dual purpose lights that are both indicators and initiators of a function. The Power light is self explanatory but also functions as an on/off

button for the transmitter. The Pair light indicates a wireless handshake between sender and receiver and functions as a button for pairing additional receivers to one transmitter. The D2 transmitter conveniently features a volume control on the front panel as well. This volume control is disabled when using the receiver's digital output thus doesn't require a setting of Max level like software playback applications. When the receiver is connected to a preamplifier via the RCA 2 volt analog outputs I found setting the volume at its maximum level to be sonically preferable when using the preamp's volume control. The transmitter's volume control is most useful when the receiving end of the D2 is connected to a pair of powered loudspeakers or when the convenience factor of a volume control at arm's length outweighs all else. While working at my desk and sending audio from a MacBook Pro to my main audio system I used the D2's volume control several times simply because it was convenient. My only major complaint about the D2's external design is the fact that the audio inputs and optional power port are located on the same side as the volume control. I consider this side of the unit to be the front. Snaking a USB cable around to the front of an audio component is rather unsightly and can consume precious space when placed on a desk. All USB cables I used with the D2 protruded from the front of the unit at least 2.5 inches. Granted this is a first world problem but a problem nonetheless. Considering the rear of the D2 transmitter and receiver contains wireless antennas there may be solid engineering reasoning for placing more sensitive audio inputs on the front panel. The body of the D2 receiving unit is distinguished from the transmitter by its lack of volume control, digital optical S/PDIF output, and pair of analog RCA outputs. The digital optical output connects via TosLink cable to nearly all DACs and receivers produced today. Connecting digitally allows use of an external digital to analog converter or receiver of the user's choice. The D2's analog outputs take advantage of the unit's internal DAC and allow removal of at least one additional external component (receiver or DAC and even preamp) in one's audio system. Throughout the review period I switched between both analog and digital outputs. I was pleasantly surprised how good the analog output sounded when connected to my Spectral Audio DMC-30SS Series 2 preamp.



Digging deeper into the Audioengine D2's design reveals an asynchronous USB interface, independent closed wireless network, and a unique method of sending volume level from transmitter to receiver. The D2 transmitter houses a Texas Instruments 1020B USB interface chip. This is a very popular chip used in many high end audio products. Despite the fact that Audioengine's website says the D2 uses adaptive USB transfer mode, I believe the D2 runs as an asynchronous USB device. Using Apple's USB Prober tool it's easy to see the D2 is an Isochronous asynchronous data endpoint. I brought this apparent discrepancy up to the Audioengine team and received a very humble response. Instead of shooting for the mystique of an asynchronous classification Audioengine focussed more on the sound of the product. These guys have no interest in the technical debates surrounding what makes an interface asynchronous or adaptive. In my view they've erred on the side of caution by not touting the D2's async capability. Classifying this product isn't as easy as a traditional wired USB DAC. In the D2 transmitter the I2S and wireless subsystem decouple the clocks and at the D2 receiver the data is re-clocked. End to end the D2 isn't identical to what async purists may consider true asynchronous. Another advantage of the D2's USB implementation is driverless installation. The D2 is plug n' play on Windows, OS X, and Linux up through 24 bit / 96 kHz.

Prior to sending the digital audio signal over the wireless interface the D2 resamples all data to 96 kHz. Changing the sample rate is controversial to purists who demand bit perfect data in and out. I consider myself a purist for bit perfect audio, but I'm willing to accept the workings of some products that offer capabilities not found in other products I've used, such as wireless streaming. That said I'm certainly not going to replace my reference level DACs with the D2 but I'm sure that's wasn't Audioengine's intention when it created the D2. Different horses for different courses as they say. In addition to resampling the data Audioengine encodes the volume information in a separate I2C sideband independent of the audio bands. This separate sideband is used by the PCM1792A DAC chip's attenuator circuit in the D2 receiver. According to Audioengine this volume attenuation never affects the digital audio signal and this separate-path wireless channel transmits volume information to the analog section of the Receiver. However, researching the PCM1792A leads me to believe this chip attenuates in the digital domain and reduces bits like other chips ([Link](#)). I admit I'm no expert in this area and I was unable to independently verify exactly how the D2 volume attenuation works. Either way the D2 is a good sounding device that delivers on Audioengine's promises.

Sending audio from the transmitter to the receiver is done via an independent closed 802.11G wireless network. The D2 creates its own network link between sender and receiver. This link is closed to all other wireless traffic. I like this method for a couple reasons. First, there is no network setup or difficult device pairing configuration needed by the end user. In fact the D2 sender and receiver come pre-paired in the box. Second, a closed network eliminates a myriad of variables involved with a shared network including competing for bandwidth as is happening right now in my house while my wife streams HBO Go to her iPhone and complains it's running too slow. With a 105Mbps Internet connection and Gigabit Ethernet / 802.11N (2.4 & 5 GHz) dual band network in our house I'm pretty sure the network isn't the cause. I would have absolutely no doubt about ruling out network congestion if my wife had her own independent closed wireless network like the Audioengine D2. I would enjoy saying, "Honey you're on your own private network." Throughout the review period I never heard a single dropout or sonic oddity related to the D2 wireless network. It's independent. It's closed. It just works.

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Audioengine D2 24-bit Wireless Computer Interface In Action

The biggest selling point of the Audioengine D2 system is freedom. The D2 transmits all (PCM) music file formats from any computer media player to any device with optical S/PDIF or analog input. In layman's terms this means users of Mac, Windows, Linux, JRiver, Windows Media Player, Foobar, Amarra, Pure Music, Decibel, Fidelia, MPD, MOG, Spotify, Pandora, YouTube, etc... can use the D2 as a wireless device. The D2 functions completely independent of the playback application. It simply appears as a USB DAC to the operating system. The applications can either send music directly to the D2 using WASAPI or route the music through the operating system to the D2 using DirectSound or Audio Midi on a Mac. Plus, the D2 transmitter can send up to three HD audio streams simultaneously to different D2 receivers. All three receivers must play the same music as there is only one output device.

I connected the D2 transmitter to my Windows 7 / JRiver [C.A.P.S. v2.0 server](#) and the receiver to a Chord Electronics QBD76HD DAC via Optical S/PDIF TosLink cable. In this configuration the D2 was used as a wireless USB to S/PDIF converter. The receiving end of the D2 requires a switch mode power supply. As such using the optical output is likely beneficial because it electrically isolates the D2 from the rest of the audio system. Using the D2 with JRiver required a bit of trial and error to get smooth playback. I found WASAPI Event Style with the hardware buffer set to 10 milliseconds to be a bullet proof solution. Once JRiver was configured I used JRemote for control and



never returned to the computer for further configuration or due to playback issues. 

Playback through the Chord QBD76HD sounded good. Sonic drawbacks with this setup compared to a direct USB connection to the Chord could be heard as rounded edges of transients, a loose bottom end, and lack of clarity in the upper most frequencies. Readers should keep in mind the Chord USB connection is very good and set the bar very high. I didn't expect the wireless D2 system to best the Chord via USB in any way. Also, asynchronous USB operates vastly different from optical S/PDIF. Via USB and S/PDIF I set the QBD76HD's internal buffer to Max to attempt to even the playing field between inputs and improve the quality of the audio. Working strictly from memory I believe the Squeezebox Touch via wired Ethernet is sonically superior the D2 in my system when using both unit's digital outputs. Analog outputs are a completely different story. The Audioengine D2 surprised me very much by how good the analog outputs sounded when connected to my Spectral Audio DMC-30SS Series 2 preamp. One possible reason for the D2's sound signature via its digital output may be related to a sample rate abnormality I discovered during testing. When connected to the Chord QBD76HD the display on the Chord DAC had the letters ERR instead of 96.0 for the locked sample rate. Further testing with a Berkeley Audio Design Alpha DAC revealed the incoming sample rate from the D2 as 95.2 kHz. I've seen this type of behavior one other time because of an incorrectly set or lack of a status bit from the sending device, in this case the D2. However, Once music was played I was previously able to cycle through the inputs and see the correct sample rate on my DAC. This was not the case with the D2. No matter what I tried the Chord DAC displayed ERR and the Alpha DAC displayed 95.2 kHz.

Note: Shortly before publication I received information from Audioengine about this sample rate issue. Here is the explanation. *"The optical is carried through at 95.2Ks. This is due to a characteristic of the wireless modules we use. The output of the receiver module is "natively" 95.2. In order to change back to 96, we would have had to use a sample rate convertor on the receiver side. This would have had two consequences -- 1) higher cost, and 2) higher THD+N on the optical output. Our tests showed that most DACs and receivers did not have any issue with decoding 95.2 vs 96. Also, our philosophy has always been to do as few data conversions as possible. So we decided to leave it at 95.2."*

My experience with the D2 analog outputs was in combination with my MacBook Pro running OS X 10.7.4. In this configuration the D2 was used as a wireless USB DAC. As a DAC the D2 sonically out-punts its coverage. I was impressed by the sound quality and thoroughly enjoyed listening through the D2's analog outputs. I set the D2 volume to 100% and used my preamp to attenuate the output level. Listening to Ottmar Liebert's One Guitar at 24/96 was better via analog outputs than digital. I still heard a bit of the same sonic signature such as rounded transient edges but overall the sound was more enjoyable via analog. Compared to the Squeezebox Touch via analog output the D2 has a much fuller and richer sound. Compared to an Apple AirPort Express via analog out the D2 blows it away in all categories other than price. At \$99 Apple is nearly giving the AE away, but users still have many application and sample rate restrictions when using the AE.

In addition to using the D2 for music playback my main audio system I also used the devices for pure convenience. I try to listen to The Adam Carolla Show podcast every day. Depending on the state of my iTunes library I either have the show downloaded via podcast subscription or I'll play it from the website when I don't feel like messing with iTunes. It was really cool to listen to this show on my main system even though the playback quality through a web browser is 64Kbps MP3. This hobby is all about enjoyment of music and sounds whether an orchestra, Jimi Hendrix, or Adam Carolla's nasally drone. While the D2 was in my system I sent everything from a 64Kbps MP3 podcast to high resolution 24/96 audio wirelessly to my main system using both a Mac and a PC with a number of playback applications. I haven't used another wireless device that enables this much playback versatility and I don't believe one currently exists.

One configuration option I did not try but is worth noting is using the D2 as a wireless optical S/PDIF to

S/PDIF link. This configuration could be used not only with a computer but also something like a TV or Blu-ray player. If a TV is mounted on the wall and an optical cable can't reach one's receiver the D2 could be used to link the TV's optical output to the receiver's optical input wirelessly. I'm sure there are many other scenarios where the D2 can be used as an optical to optical wireless link such as Xbox 360 S, PS3, cable box, etc...

Conclusion

The Audioengine D2 wireless computer interface produces good sound quality and frees wireless audio transmission from proprietary or clunky applications and subpar hardware. While not a reference level component its \$599 MSRP isn't a reference level price. Overall the sound quality is good with the analog outputs besting its digital output capability. Users considering the D2 and other wireless devices should also consider the requirements of all available choices. The big game changer with the D2 is freedom of, and freedom from for U.S. Constitutional experts, playback applications and operating systems. No longer must users care if an application supports Apple's AirPlay because the Audioengine D2 accepts music from any application. Also, the clunky Logitech Media Server software can be tossed in favor of JRiver Media Center or even iTunes. The Audioengine D2 is the wireless interface I prefer over all others for its sound quality via analog outputs, convenience, and software independence.

Product Information:

- Product - Audioengine D2 24-bit Wireless Computer Interface
- Price - \$599
- Product Page - [Link](#) 
- Features Sheet - [Link](#) 
- Setup Guide - [Link \(PDF\)](#) 

Associated Equipment:

- Source: [MacBook Pro](#), [C.A.P.S. v2.0 Server](#)
- DAC: [Berkeley Audio Design Alpha DAC Series 2](#), [Chord Electronics QBD76HD](#)
- Preamp: [Spectral Audio DMC-30SS Series 2](#)
- Amplifier: [Spectral Audio DMA-260](#)
- Loudspeakers: [TAD Labs CR1 Compact Reference](#)
- Remote Control Software: [JRemote](#), [Apple Remote](#)
- Remote Control Hardware: [iPhone 4](#), [iPad \(3rd Generation\)](#)
- Playback Software Windows 7: [J River Media Center 17](#), [iTunes](#)
- Cables: [Spectral Audio MH-770 Ultralinear CVTerminator Series II Loudspeaker Cable](#), [Spectral Audio MI-350 Ultralinear CVTerminator Series II Analog Interconnects \(RCA\)](#), [Mogami W3173 Heavy Duty AES 110 ?](#), [MIT Oracle ZIII Power Cables](#), [AudioQuest NRG-100 Power Cables](#), [Wire World Silver Starlight USB Cable](#), [AudioQuest Diamond USB Cable](#)
- Network: [Cisco SG200-26 Switch](#), [Baaske MI-1005 Ethernet Isolator](#), [Micro Connectors](#)