Usb digital to analog converter

DAC 2.1
The Magenta DAC2.1 has one of the latest and best technology in USB receivers and digital to analog conversion, but it’s performance it’s not only based in this important digital domain section, The MAGENTA DAC 2.1 has a dual shunt power supply and an totally discreet analog output.

The input is asynchronous USB 2.0 to SPDIF converter is the best USB converter, It has up to 8 macro cores inside running at 500Mhz with a very powerfully data processing ability. There are three imported high precision oscillators located close to the receiver chip, making the shortest path and reducing jitter, It is very important for high frequency transferring.

The Analog Output is a totally discrete proprietary circuit that does not use the feedback loop to do the integration or filtering.

The MAGENTA DAC 2.1 has two power supplies, one for the digital section and the second for the analog, both are shunt.

Shunt technology provides a dramatic improvement in Q damping, Good regulation reduces the loss of signal integrity that occurs when the signal itself shifts the amplifier’s operating point.

This topology is a key factor along with its shunt power supply, to give its characteristic sweet detailed and reach sound.

Key note on USB Audio
USB audio is very popular.
One of the reasons is that USB audio is part of the USB standard and as a consequence native mode drivers are available in all the popular OS (Win, OSX and Linux).
Connecting a USB audio device is a matter of plug&play.

USB audio is a flexible solution as any PC offers USB.
If you use a laptop this is probably the way to go if you want to improve on the on-board sound card.

The audio is routed to the USB.
This is a matter of choosing the USB audio device in your media player.
The on-board sound card is bypassed; in fact you don’t need a sound card at all.
The USB audio device is your (outboard) sound card.

Today the resolution of USB audio ranges from 16 bit/ 32 kHz to 32 bit/ 384 kHz.
Your Magenta DAC 2.1 has a range to up yo 32bit/384 khz.

The data transfer from the PC to the MAGENTA DAC 2.1 is asynchronous mode. By design asynchronous mode eliminates input jitter.

- **Asynchronous**
- In this mode an external clock is used to clock the data out of the buffer and a feedback stream is setup to tell the host how much data to send.
- A control circuit monitors the status of the buffer and tells the host to increase the amount of data if the buffer is getting too empty or to decrease if it’s getting too full.
Since the readout clock is not dependent on anything going on with the bus, it can be fed directly from a low jitter oscillator, no PLL need apply.
This mode can be made to be very insensitive to bus jitter.
Resolution
A lot of people think USB audio is limited to 16 bits/48 kHz max.
A lot of (cheap and sometimes not so cheap) USB DACs are indeed limited to this resolution.
Another common misunderstanding is the specification of the bus (USB 1,2 or 3) and the USB audio standard (1 or 2).

USB Audio Class 1 standard (1998)
This standard allows for 24 bits/96 kHz max.
The standard itself doesn’t impose any limitation on sample rate.
Class 1 is tied to USB 1 Full Speed = 12 MHz

Every millisecond a package is send.
Maximum package size is 1024 bytes.
2 channel * 24 bit * 96000 Hz sample rate= 4608000 bits/s or 576 Byte/ms
This fits in the 1024 byte limit.
Any higher popular sample rate e.g. 176 kHz needs 1056 bytes so in excess of the maximum package size.

All operating systems (Win, OSX, and Linux) support USB Audio Class 1 natively.
This means you don’t need to install drivers, it is plug&play.
All support 2 channel audio with 24 bit words and 96 kHz sample rate

USB Audio Class 2 standard (2009)
It is downwards compatible with class 1.
USB Audio Class 2 additionally supports 32 bit and all common sample rates > 96 kHz
Class 2 uses High Speed (480 MHz). This requires USB 2 or 3.
As the data rate of High Speed is 40 X Full speed, recording a 60 channel using 24 bits at 96 kHz (132 Mbit/s) is not a problem.
From mid-2010 on USB audio class 2 drivers are available in OSX 10.6.4 and Linux.
Both support sample rates up to 384 kHz.

It is unclear if Microsoft is going to support USB Audio 2.
You need a third party USB class 2 driver on Windows.
Using High Speed USB for playback there are no limits in resolution.

USB Speed
- Superspeed - 10 Gbps USB data rate (USB 3.1)
- Superspeed - 5 Gbps USB data rate (USB 3.0)
- High Speed - 480 Mb/s with a data signalling tolerance of ± 500ppm (USB 2).
  This means every 125 µs a SOF packet arrives with a allowed deviation of ± 0.0625 µs.
- Full Speed - 12 Mb/s with a data signalling tolerance of ±0.25% or 2,500ppm. (USB 1&2)
  This means every 1ms a SOF packet arrives with a allowed deviation of ± 500ns.
- Low Speed - 1.5Mbits/s with a data signalling tolerance of ±1.5% or 15,000ppm (USB 1&2)

USB cables
- Cable length between full speed devices is limited to 5 meters. For a low speed device the limit is 3 meters.
- As the signal degrades proportional to the length of the cable, a short cable is often recommended.
- Other says this can put a source of RFI (the PC) to close to the USB-DAC.

Audiophile USB cables
- As file based audio is gaining momentum and many believe asynchronous USB the way to go there is a growing market for audiophile grade USB cables.
- The question of course is why a cable can have any impact on sound quality.
Specifications:

Digital to analog converter is high resolution 112DB S/N ratio and -93DB

coaxial output support 44.1K to 192Khz sampling rate

Harmonic distortion: 0.002%

Max Output voltage 2.4 Volts

For IOS the drivers are already in the computer.

For PC users download drivers from:

www.margules.com