Berkeley Audio Design® Alpha USB®

The Alpha USB is an asynchronous High Speed USB to digital audio interface designed to provide the highest possible audio quality from computer and music server audio sources. Please take a few minutes to familiarize yourself with this User Guide before connecting power to the Alpha USB. Doing so will help ensure the best possible performance.

INSTALLATION

The Alpha USB should be installed in a space with several inches of clearance above, behind and on both sides of the chassis to provide adequate ventilation. Avoid placement directly above other equipment that produces significant heat.

Power Connection

The Alpha USB is designed to run continuously when connected to AC mains power. It has no power switch and as soon as AC power is connected the unit is powered on. Units for sale in the United States are set internally for 120VAC operation. An Alpha USB dealer can select 240VAC operation for use outside of the United States by setting an internal switch and adding a 240V label to the rear panel. 100VAC operation requires a specific power transformer. The AC power fuse used for all mains voltages is a 5 x 20mm Cartridge, .05A Time Lag (Slo-Blo) Littelfuse 0218.050MXP or 0218.050HXP. .

Powering the Alpha USB from the same power source as the D to A converter and other analog components is recommended. Its linear power supply has several layers of isolation between the power cord and the digital circuitry, and it performs best when treated as an analog component. The computer or music server should be powered from a separate circuit whenever possible to minimize radiation and conduction of power line noise.

Signal Connections

Alpha USB Rear Panel

The Alpha USB has a High Speed USB 2.0 input data connection and has switch selectable output signal type – either coaxial SPDIF using a BNC connector or balanced AES using an XLR connector. Sampling rates up to 192 kHz and word lengths up to 24 bit are supported.

Lead Dress

It is good practice to keep various types of signal and power cables physically separated from each other. This is especially important for the USB cable to the computer. It should be routed away from the chassis of the Alpha USB and any other component or cable that is part of the audio system. 1.5 meters is a good default length for USB, SPDIF and AES cables.

OPERATION

Alpha USB Front Panel

Controls & Indicators
- Output Select: switch selects coaxial SPDIF or balanced AES type output
- Status LED: Green indicates USB Lock, Amber indicates Standby

The Alpha USB has one control and one bi-color indicator LED. The digital audio output is available as either a 75 ohm SPDIF signal on a BNC connector or as a 110 ohm balanced AES type signal on an XLR connector. A switch on the rear panel selects which output is active. Only one output is active at a time in order to minimize jitter. Whenever possible, use of the balanced AES signal output is recommended for best performance.

The indicator LED on the front panel is amber when AC line power is on but the USB connection is not active. As soon as the USB connection to the computer is established and the computer and the Alpha USB are talking to each other, the LED turns green.

In normal use, AC power to the Alpha USB should be applied first. Then the computer should be powered up or the USB cable connected. Nothing catastrophic happens if the computer side is powered up first, but since the Alpha USB audio master oscillators are not powered, the USB driver in the computer may become confused. If this happens, unplug the USB cable and then plug it back in.

The Alpha USB has no AC power switch and is designed to be left powered on. It draws only 3 watts of power and when the USB input is not active, the unit goes into a standby mode.

Computer Configuration

The Alpha USB is designed to work with Apple Macintosh and Windows PC computers and Linux based music servers. For Linux, the operating system must be ALSA 1.0.23 or above. It must also have the ability to select the output device.

Apple Macintosh Computers
The Alpha USB interface conforms to the USB 2.0 High Speed audio interface standard that supports sample rates up to 192 kHz/24-bit. This means that for Apple Macintosh computers using the Snow Leopard or later operating system, the USB Audio Driver from Apple interfaces correctly with the Alpha USB. It is not necessary to install our driver. This is also true for newer versions of Linux, and newer versions of Windows 10. For optimum audio quality with a Mac, use of high resolution music server software such as Audirvana, Amarra, Pure Music or JRiver Media Center set up for bit-perfect operation is highly recommended.

The Pure Music application uses iTunes to manage files and as a user interface, but the audio data is played through its own engine, bypassing core audio in the Mac for bit-perfect output. It also has the ability to switch sample rates on the fly in full coordination with the Alpha USB and Alpha DAC, while maintaining bit accurate transparency.

Please **follow the 27 steps below in exact numerical order** to install and optimize Pure Music for use with the Alpha USB.

1. Plug the Alpha USB into one of the USB ports on the Mac. See Note below.
2. Under the Apple Menu, click on "About This Mac".
3. Click on "More Info".
4. In the Contents column under Hardware, click on "USB".
5. In the USB Device Tree "Alpha USB Digital Output" should appear.
6. Make sure it is the only active device on its USB High-Speed Bus. See Note below.
7. If necessary, move the USB cable to a different port, or disable the conflicting device and check again.
8. Quit the System Profiler.
9. Open the Audio MIDI Setup application in the Utilities folder.
10. "Alpha USB Digital Output" should appear on the list of devices.
11. It should **NOT** be selected as an output device. Select "Built-in Output" for music and system sounds.
12. Quit the Audio MIDI Setup application.
13. Launch Pure Music.
14. If you have altered the default settings, go to Preferences under the Pure Music Menu.
15. Click the "Defaults" button near the bottom, and accept the action. PM will re-launch.
16. On the Pure Music menu bar under Metering, click on "Signal Metering" to un-select it.
17. Under the Music Server menu, click on "Memory Play" and "Disable DSP Options" to select them.
18. Under the Pure Music menu, click on "Audio Setup…"
19. In the Output Device area, select "Alpha USB Digital Output" in the drop-down list.
20. Check the box "Enable Exclusive Access ("Hog" Mode)".
21. Near the bottom of the window, click on the "Click to Apply Changes" button.
22. After PM re-launches, once again go to Pure Music > Audio Setup…
23. To the right of the Hog Mode check-box is a box for "Native Integer Format Support".
24. Click to check the box. Note: Native Integer Format Support is not available at present with the Lion operating system. For the Lion operating system do not check the box.
25. The menu should close and take you to iTunes with the message "Nonmixable Integer Output Stream" (if selected) and "Select track and press return".
26. Select a track and press play or return.
27. The track should start playing through the Alpha USB, and on the Pure Music bar above iTunes there should be a series of status messages in small green letters:

- Alpha USB Digital Output
- Native Sample Rate (xxx kHz)
- Playing from Memory
- Native Integer Device Stream (if selected)
- DSP Options disabled

Pure Music setup is complete.

NOTE: not all USB connections on a computer are equal. USB does not have a guaranteed latency mode, so for a real time task like audio stream delivery, it is important to connect the Alpha USB interface to a lightly loaded hub. All USB devices and where they are connected can be seen under "About This Mac" under the Apple Menu. Click on it, and then on "More Info", which launches the system profiler. Click on "USB" under Hardware to see the full list.

Windows PC Computers

NOTE: PC's using Microsoft Windows 10 release 1703 and above do not require installation of the Alpha USB Windows driver and the driver provided with Windows should be used. Only Microsoft Windows PC's using Windows XP, Vista, 7, 8, 8.1 and earlier versions of 10 require the Alpha USB Windows driver. Windows 7, 8 and 10 function well as an audio server and are preferred over XP. Vista is not recommended.

To obtain the Windows driver, go to **http://www.berkeleyaudiodesign.com/downloads**. Under **Alpha USB Windows Driver and Instructions**, click on **Download →**. The **Alpha_USB_Windows_Driver_and_V1.1.3_Instructions.zip** folder will download.

Unzip the **Alpha USB Driver Installation Instructions V1.1.3.pdf** file and the **Alpha_USB_Windows_Driver_v126b** folder from the .zip folder.

Open the **Alpha_USB_Windows_Driver_v126b** folder, and run **setup.exe**.

NOTE: For Windows 8, 8.1 and older versions of 10, the 1v26b version of the Alpha USB Windows driver will install and operate but <u>Windows 7 compatibility mode must be used for the installation.</u>

Using Windows 7 compatibility installation mode:

Right click on the driver's **setup.exe** icon, select **Properties** from the contextual menu then click on the **Compatibility** tab. In the Compatibility section, select the **Run this program in compatibility mode for:** check box and select **Windows 7** from the drop-down list. Click on the **OK** button and then run **setup.exe**.

Follow the onscreen instructions, which include connecting the Alpha USB to a USB port, and, usually, exiting any Microsoft Wizard that tries to do things automatically. During the installation two dialog boxes may appear warning that Microsoft has not blessed the software. Click on the **Install Anyway** button in both cases.

Windows compatible music players such as JRiver Media Center, Media Monkey and Foobar should be used to provide bit-perfect output. Windows Media Player is not recommended.

For Windows 7, 8 and 10 the preferred connection is WASAPI. It provides low-overhead, bit-perfect data output with automatic sample rate switching, and works very well.

For Windows XP, ASIO must be used to connect the music player to the USB output to get bit perfect data. The Alpha USB ASIO driver identifies itself as "TUSBaudio ASIO driver" in the music player's output select setup dialog. JRiver Media Center, Media Monkey and Foobar all support ASIO for Windows XP. A "Kernel Streaming" output may also appear. Do not select it.

SPECIFICATIONS

- Input: High Speed USB 2.0/USB 3.0 connection - type B receptacle
- Output: switch selected, coaxial SPDIF - BNC, 75Ω or balanced AES type - XLR, 110Ω
- Supported sampling rates: 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
- Supported word lengths: up to 24 bit
- Supported operating systems: Apple Macintosh, Microsoft Windows and Linux
- Enclosure dimensions: 2.3"H X 10.5"W x 5"D, 2.55"H including feet
- Mains power: 100 or 120 or 240 VAC, 50/60 Hz, IEC power input connector
- Power consumption: 3 Watts line, 1.5 Watts USB, designed for continuous operation

For further information on the Alpha USB, please contact Berkeley Audio Design, LLC at: info@berkeleyaudiodesign.com or call 1-510-277-0512