

Instructions and Manual

Rev 1.0

Orchid

Realistic yet Natural Sounding DAC

Mhdt Labs
Audio Products

Thank you for purchasing the Mhdt Labs' *Orchid* DAC.

Please take a few moments to read over this instruction manual to get the most out of your unit. The manual describes how to operate the Mhdt Labs' Orchid DAC and provides some technical background information.

Should you have any further questions or suggestions on how to improve this manual, please feel welcome to get in touch with us.

We hope this investment will bring you many years of outstanding listening enjoyment.

Important Safety Instructions

Please follow these precautions when using this product:

- Read and keep these instructions.
- Heed all warnings.
- Dangerous voltage is inside this apparatus. Opening is only allowed by qualified service personnel.
- Verify line voltage before use.
- Protect the power cord from being walked on or pinched, particularly at plugs, convenience receptables, and the point where they exit from the apparatus.
- Do not use this apparatus near water.
- Do not use this apparatus outside.
- Do not expose the apparatus to dripping or splashing. Do not place objects filled with liquids (flower vases, drink cans, coffee cups, etc) on the

apparatus.

- Unplug the unit from the mains supply before cleaning. The case should normally only be cleaned with a dry, soft, non-fluffy cloth. Do not spray any liquid cleaner onto the cabinet, as this may lead to dangerous shocks.
- Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat. Avoid exposure to direct sunlight.
- This unit runs slightly warm when operated normally. Operate in a normal ventilated area. If this product will be installed in a rack, make certain there is sufficient air movement within the rack.
- Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as when the 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.
- To reduce the risk of fire or electric shock, do not expose this apparatus to rain or moisture.

1. Introduction

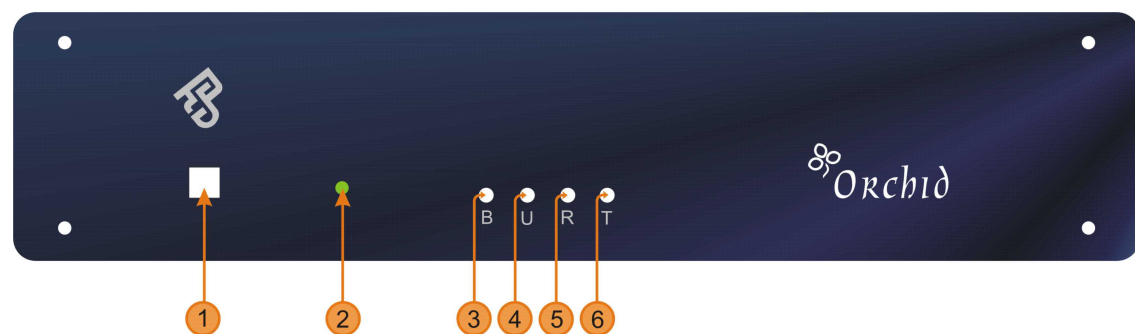
Orchid DAC is capable of up to 24bits/192kHz digital signal inputs.

Orchid DAC is a non over-sampling, no digital filter, no op-amp, no feedback structured DAC. This tends to produce most realistic and natural sound.

The USB input section can handle 16-24bits at 44.1, 48, 88.2, 96, 176.4 and 192kHz digital signals. This makes **Orchid** DAC a powerful digital music station.

2. Connections and Operation

2.1 Front Panel

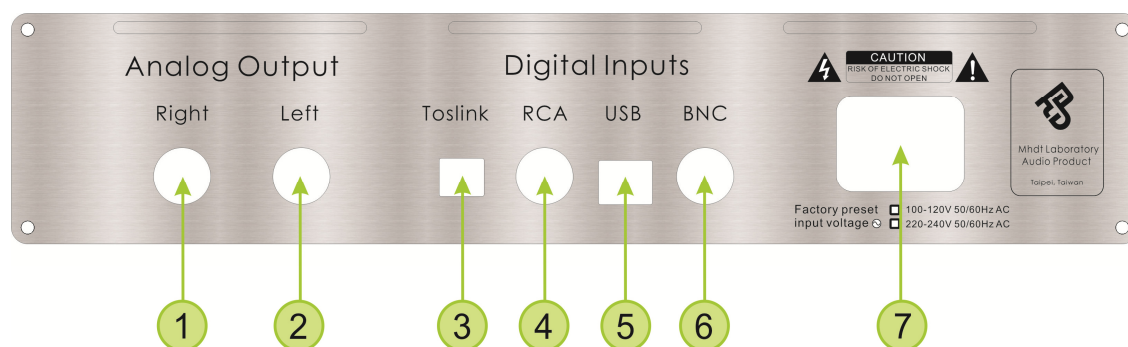


- 1** Main power push on/off switch
- 2** Indication Led, lights on when signal is locked
- 3** Digital input select switch – B, BNC input, SPDIF format
- 4** Digital input select switch – U, USB input, SPDIF format
- 5** Digital input select switch – R, RCA input, SPDIF format

6 Digital input select switch – T, Toslink input, SPDIF format

When any of digital inputs is selected, this input is stored after selection, and will remain the last selection after disconnection from mains power.

2.2 Rear Panel Connections



- 1 Right Channel Analog Output – Connect to Pre-Amplifier or Receiver's line input
- 2 Left Channel Analog Output – Connect to Pre-Amplifier or Receiver's line input
- 3 Fiber Optical Digital input – Connect to CD Transport, CDP, DVD or PC's Digital Optic output. Capable of 16-24bits, 32-192kHz SPDIF digital signals.
- 4 Coaxial Digital Input / RCA - Connect to CD Transport, CDP, DVD or PC's Digital output. Capable of 16-24bits, 32-192kHz SPDIF digital signals.
- 5 USB Digital Input - Connect to PC's USB Port, please do not connect to USB port on external hub to achieve better sound quality. Capable of 16-24bits at 44.1, 48, 88.2, 96, 176.4 and 192kHz digital signals..
- 6 Coaxial Digital Input / BNC - Connect to CD Transport, CDP or DVD Digital output. Capable of 16-24bits, 32-192kHz SPDIF digital signals.
- 7 Main Powercord Inlet – Check the preset voltage indicated below this slot, this can be either 220-240VAC or 100-120 VAC (50/60Hz).

The 4 digital inputs, i.e., 3, 4, 5, 6 are independent to each other, only one among them will be active and is controlled by the tact switches located in front

panel.

2.3 Powering up

Before applying power to the **Orchid** DAC, ensure that the correct mains voltage is used. This can be either 220-240VAC or 100-120 VAC (50/60Hz). The factory preset voltage is indicated on the rear panel.

After applying mains voltage, a blue led will light up in one of the tact switch on the front panel.

The filaments of vacuum tube located in the right side of the DAC will also slowly lighting up, it is visible through the transparent acrylic front panel. A slightly click sound of relay can be heard in about 10-15 seconds after power on and it represents that the DAC is in stand-by mode.

3. Technical specifications

Digital Receiver CS8416 x 1

D/A converter TDA1541A – R1

I/V stage: discrete ideal transistors (OPA861 used as transistor) , no feedback

Frequency response: 20 Hz to 18 kHz (± 2 dB)

Output impedance: 32 ohms

Output level: 3.0 Vrms

USB input 16, 24 bits 44.1 kHz or 48 kHz, 88.2kHz, 96kHz, 176.4kHz and 192 kHz; drivers required

USB inputs are all in asynchronous operation.

All other inputs (SPDIF) 16, 24 bits 32 kHz up to 192 kHz

Dimensions clear (W x D X H) 276 x 150 x 60 mm

Dimensions w/ socket (W x D X H) 295 x 170 x 60 mm

Weight 2 kg

4. Warranty

Warranty of this product is one year after original purchase. During the period of warranty, all repair needed parts, labor and shipment is free. Moreover, we usually replace with a new unit within this warranty period.

This warranty is enforceable only by the original retail purchaser and cannot be transferred or assigned.

This warranty does not cover claims for damage due to abuse, neglect, alteration or attempted repair by unauthorized personnel, and is limited to failures arising during normal use that are due to defects in material or workmanship in the product.

5. USB input driver installation

No driver installation is needed if using w/ Mac and Linux OS, just plug and play

USB2.0 driver installation on Windows OS

To support 176.4kHz and 192 kHz formats, the **Orchid** DAC is operated in USB2.0 full speed condition. Thus, you have to install USB2.0 driver before use USB input.

Please download necessary files from our web site:

<http://www.mhdtlab.com/Usbdriver.htm>

Or directly download from

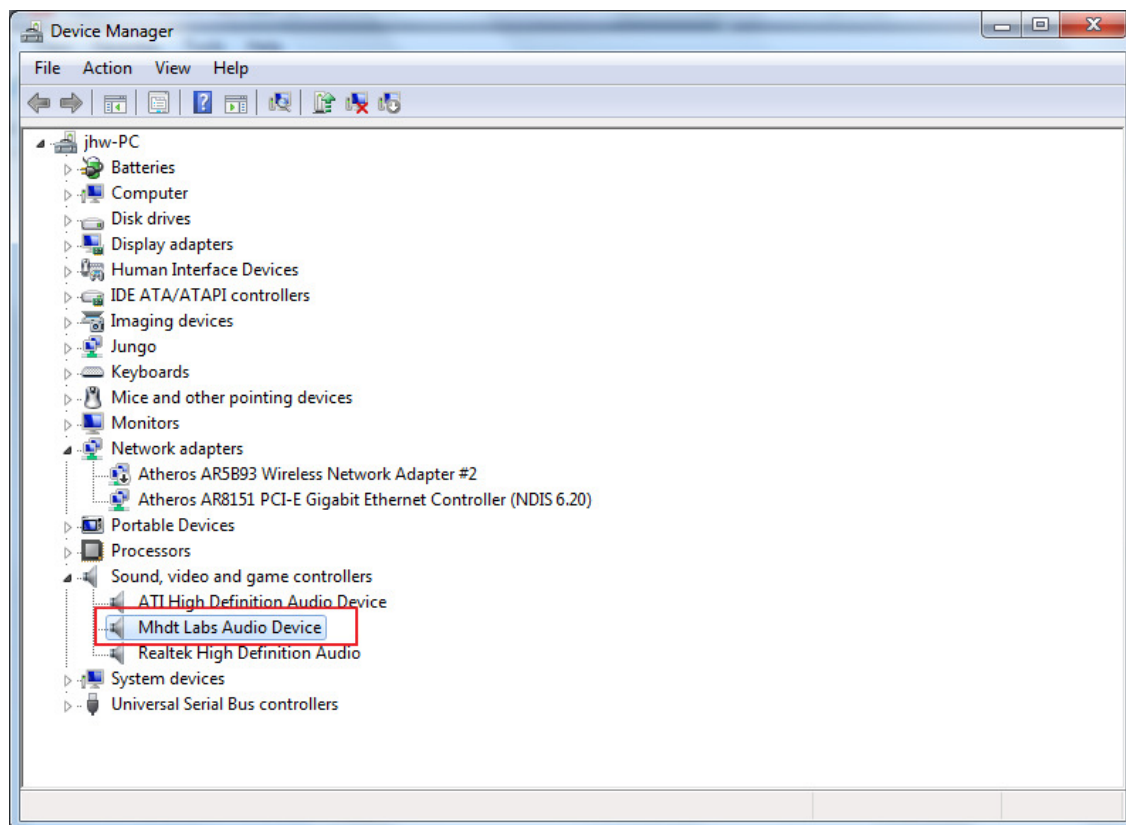
[http://www.mhdtlab.com/CM6631_6631A-1.03\(CR\).rar](http://www.mhdtlab.com/CM6631_6631A-1.03(CR).rar)

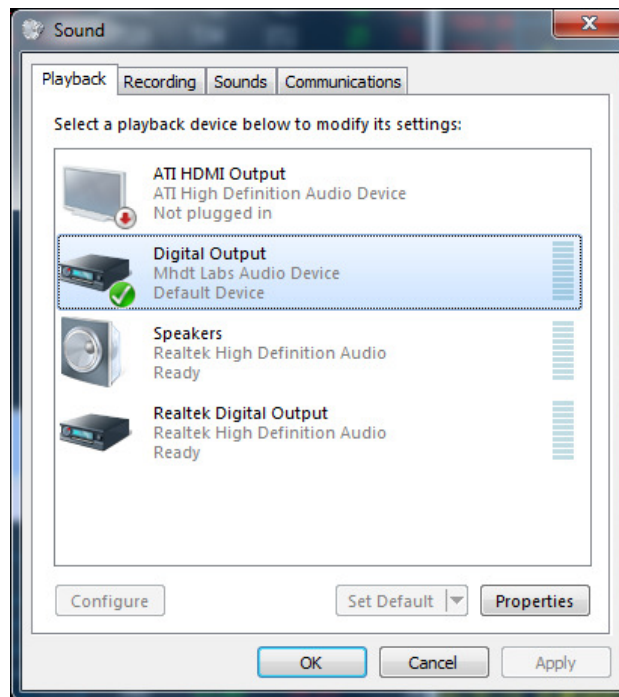
The use and setup of USB2.0 can be referred to our USBridge user manual located in: <http://www.mhdtlab.com/Usbdriver.htm>.

Let's take W7 (32/64) as example:

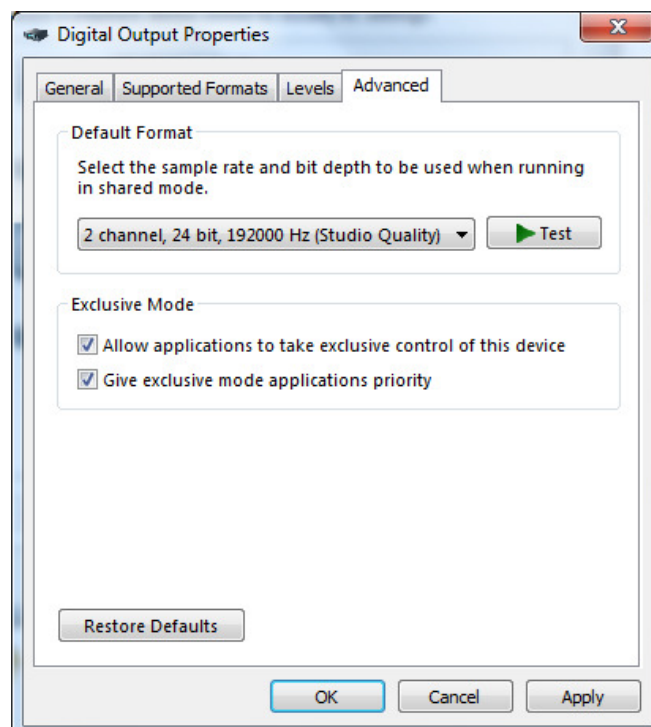
Installed driver version: **CM6631_6631A-1.03(CR)**

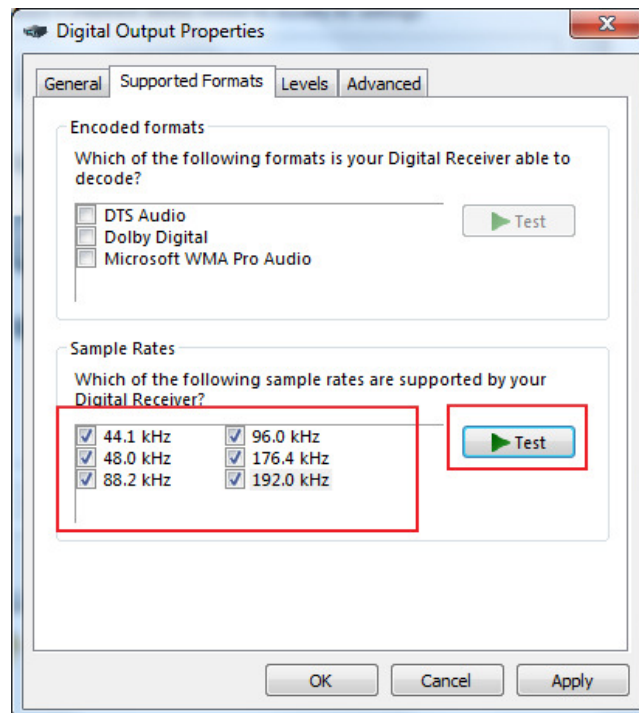
After drivers installed, please check control panel to see if the drivers is properly installed.





Test if the supported formats sounded normally.,

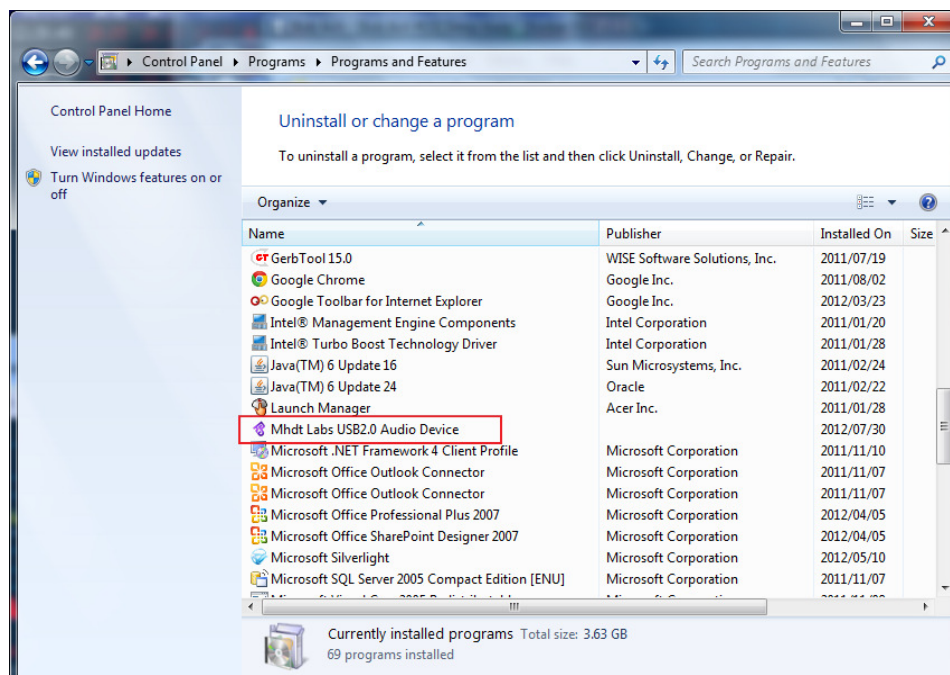




Note:

If you want to install different version of drivers, please uninstall previous drivers before install new driver.

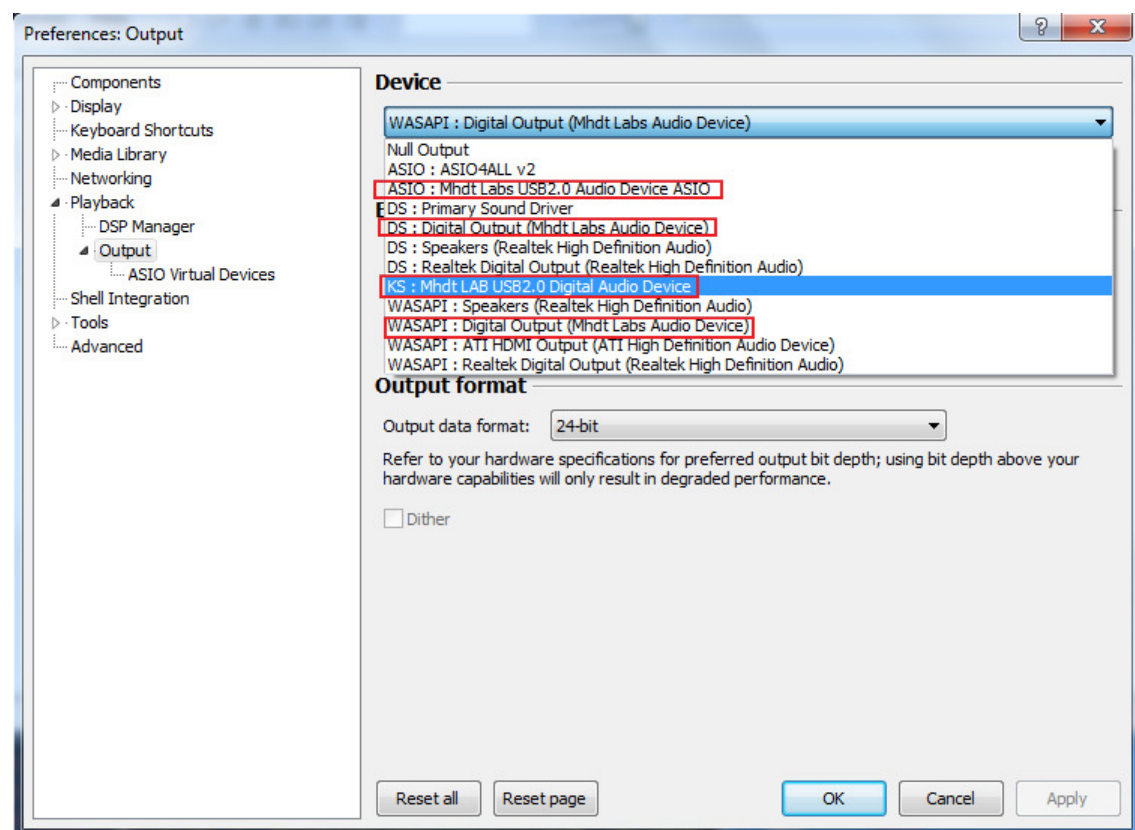
The uninstall is operated in control panel like following:



After driver is installed properly, you may try to run media agent to play the USB2.0 audio.

The **Orchid** USB2.0 input supports: 16, 24 bits 44.1 kHz, 48 kHz, 88.2kHz, 96kHz, 176.4kHz and 192 kHz formats and can handle Direct Sound (**DS**), Kernel Streaming (**KS**)(will support in newer version of driver) and **WASAPI** and **ASIO** with specific player such as FooBar or Winamp etc.

Take foobar as example.



ASIO driver. You can download these drivers from
[CM6631 6631A-1.03\(CR\)\W7\SoftwareDriver\DLL](#)
W7 is just a demonstration; it can be XP, W8, VISTA

CMUACWOASIO64.dll
CMUACWOASIO.dll

Copy these ASIO drivers to the Components folder of Foobar2000 if you are using Foobar and restart Foobar. Then, you are ready to use ASIO.

6. Plug in Android Phone, Tablet or iPhone, iPad

To get the best audio performance please use USB input if you are using Android Phone, Tablet or iPhone, iPad as source.

iPhone need iOS7 or above

iPad need iOS6 or above

Android system need OS5 or above

For Android Phone or Tablet with micro USB or Type C jacks, you need a OTG (USB On The Go) cable or adapter.

The OTG cable or adapter requires current capacity larger than 500mA to get the best performance although DAC signed up only 100mA.

For Android Phone, you also need a "USB Audio Player Pro" to output USB digital stream to the DAC.

Info of "USB Audio Player Pro" is here:

<http://www.extreamsd.com/index.php/products/usb-audio-player-pro>

For iPhone or iPad, you need the Lightning to USB (Camera) Adapter from Apple.

For some Android or iPhone or iPad, if you get "this device draws too much power" error, you'll also need a powered USB hub.

Powered USB hub is a hub with power itself (better with 500mA or above). You can google "Powered USB hub" and choose by yourself.

7. Tube, Fuse Replacement

The vacuum tube installed in Orchid DAC is GE JAN 5670W.

The reason we choose 5670W is that this tube is very reliable, durable, good sounding and easy to find in nowadays' market,

The typical life of GE JAN 5670W is about 6000-8000 hours. If you listen to music by two hours every day, you don't have to care about tube's life for almost 10 years.

The burn in time will takes about 1 day for components and about one month for tube.

Tubes can be used: 5670, 2C51, 396A, 6385, 6386, 6CC42, 6854, 6N3, CV2575, CV4013, CV5894, CV8247, CV2381

Changing tube is by your own risk. You have to remove the top cover plate to remove and insert a new tube. The hex/torx screwdriver needed is hex/2mm or torx/T8x50.

Please consult to experienced person if you are first time to do this.

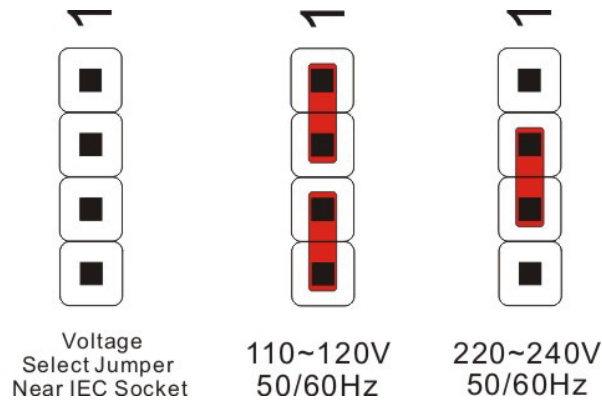
Fuse spec: 5x20mm 1.0A slow blow

8. Selection of input AC Voltage

The input AC Voltage is presented according to your country and is marked in the rear panel.

In case of traveling to different voltage area:

Find JP3 (Voltage selection jumper) on the PCB beside IEC AC socket.



The DAC is designed to be fully regulated in circuit. So, select 110-120V case can also work well in Japan's 100V.

9. Troubleshooting

In case there is no audio coming out of your system, there are a few things to check:

- **Orchid** DAC accepts USB audio signal via USB port. Be sure the input is USB audio signal.
- Orchid DAC accepts only SPDIF (PCM) format digital signal for the rest of inputs; BNC, RCA and Toslink. Other format like dts, ac3... is not accepted.
- Are both sides of filaments of the vacuum lighting? If not, try to firm the tube or the tube is dead. Change a new tube to check the problem remains.
- Orchid DAC does not need to install additional USB driver. However, in case of no sound from USB port, please check if there is any device conflict by device management under control panel.
- Avoid using USB hub in connecting Orchid DAC. Signal through USB hub

may not work properly and also decrease the sound performance.

If none of these suggestions cure the problem, please do not hesitate to contact us.

Latest version of firmware/driver can be downloaded from our website:

<http://www.mhdtlab.com/>