RAL-DSDHA1 Setup Guide

Rev. 1.0   12/Feb/2013

RATOC Systems, Inc.

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1. Introduction

Thank you for purchasing RAL-DSDHA1. We are confident that you will enjoy listening HD as well as DSD music with your PC audio system without 'Harsh Noise' at a gap of music (PCM to DSD, DSD to PCM). RAL-DSDHA1 receives DoP format compatible DSD digital music stream, passes it to DSD Direct enabled DAC and creates clear and natural sound without any conversion, and also,

RAL-DSDHA1 is fully compatible with DoP(DSD over PCM) Standard 1.1 and works with popular Music Players, such as Audirvana Plus on MacOS X, foobar2000 with foo_asio_dsd, HQPlayer and JPLAY on Windows PC.

1-1.Features

●Fully compatible with USB 2.0 (HS 480Mbps) Specifications.

●Fully compatible with USB Audio Class 2.0 Driver.

●Accepts DSD 2.8224MHz data with Markers for DoP and standard-compliant,
   and L-PCM 24bit/16bit,192kHz/176.4kHz/96kHz/88.2kHz/48kHz/44.1kHz (2ch).

2. System requirements

2-1. PC running on Windows 8,7,Vista,XP(SP2 or newer) 32/64bits

●One USB 2.0 HS(480Mbps) enabled Host port.
●One CD-ROM Drive to install USB Audio 2.0 Driver.
●RAL-DSDHA1 USB Audio Class 2.0 Driver installation required.
●The bundled CD-ROM includes the driver, installer and Instruction Guide.

Note) The knowledge and experience regarding 'Control Panel' for 'Sound Audio
Device', 'Device Manager', Audio Music Player application such as foobar,
MediaPlayer, iTunes and CD Ripping applications are required to use
RAL-DSDHA1. Refer to the User Guide, Instruction Guide or Online Help
of these Applications.

2-2. MacOS X 10.7 or newer

●One USB 2.0 HS(480Mbps) enabled Host port.
●MacOS X 10.7 or newer already includes USB Audio Class 2 Driver.
  ** You don't need to install the driver. The bundled CD-ROM does not include
    any drivers and software for MacOS X.

2-3. Stereo Headphone

●Equipped with Standard 6.35mm(1/4") Phone Plug.
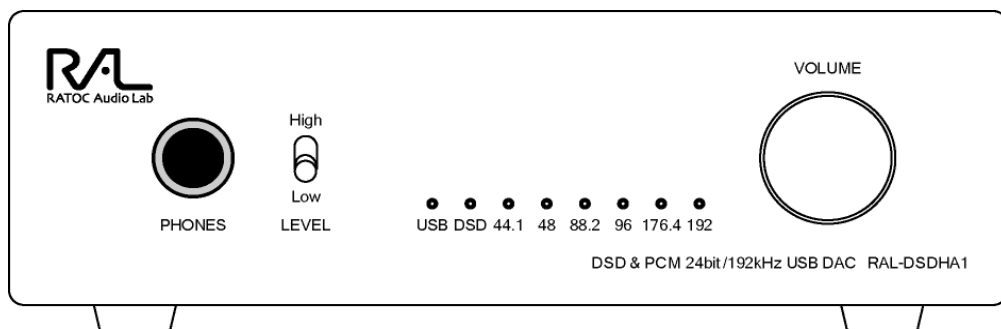●Impedance 16-Ohm to 600-Ohm

3. Package contents

RAL-DSDHA1 package includes:

●RAL-DSDHA1

●AC adapter

●USB2.0 Cable (1m)

●CD-ROM includes USB Audio Class 2.0 Driver for Windows
and 'RAL-DSDHA1 Setup Guide' (PDF file. This document.)

4.Front Panel, Rear Panel Layout

4-1. Front Panel

[PHONE]・・・Headphone Output Jack for 6.35mm(1/4") phone plug

[Volume]・・・Output level control for Headphone/Line out

[Level]　・・・Output level adjustment for Headphone out.

　　　　　Set "High" for High impedance Headphone(100ohm-600ohm)

　　　　　Set "Low" for Low impedance Headphone(below 100ohm)

LED indicators

[USB]・・・Comes on at RAL-DSDHA1 being configured as a USB Audio Device

[DSD]・・・Comes on to indicate audio stream is detected

※If DSD(DoP) music source is being played, both LED(DSD and 176.4) come on

[44.1]・・・Comes on to indicate 44.1kHz sampling rate is detected

[48]　・・・Comes on to indicate 48kHz sampling rate is detected

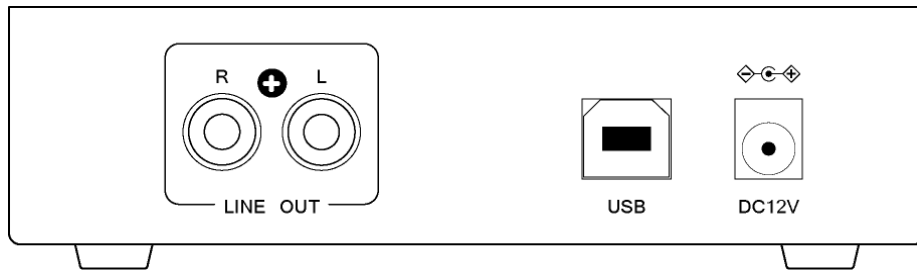[88.2]・・・Comes on to indicate 88.2kHz sampling rate is detected

[96]　・・・Comes on to indicate 96kHz sampling rate is detected

[176.4]・・・Comes on to indicate 176.4kHz sampling rate is detected

[192]　・・・Comes on to indicate 192kHz sampling rate is detected

4-2. Rear Panel

[Line Out]

　　　Stereo(L, R ch.) Audio analog line out

[USB]

　　　Connect to USB-A port of PC or Mac with USB 2.0 HS compliant cable

[DC IN]

　　　External Power(DC +12.0V) input jack

5. Setting up Mac/MacOS X
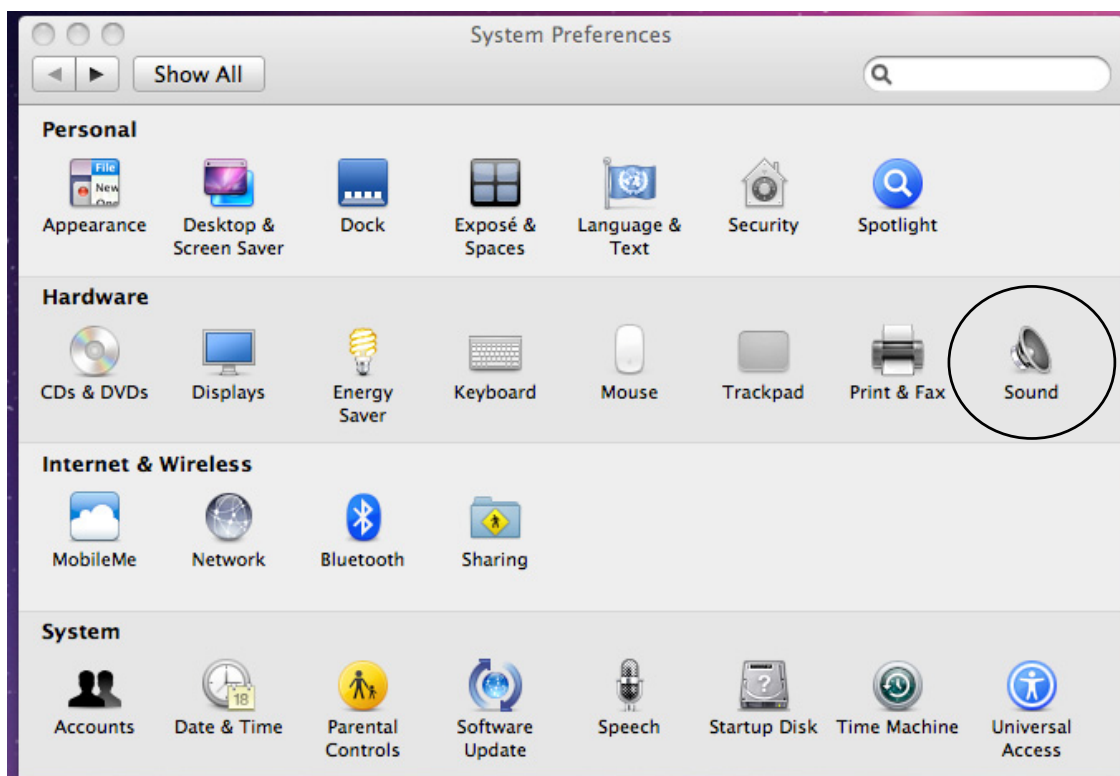
5-1. Connecting RAL-DSDHA1 to Mac USB port

Getting started with setting up your Mac/MacOS X 10.7 or newer.

(1) Connect RAL-DSDHA1 to Mac USB port with USB cable.

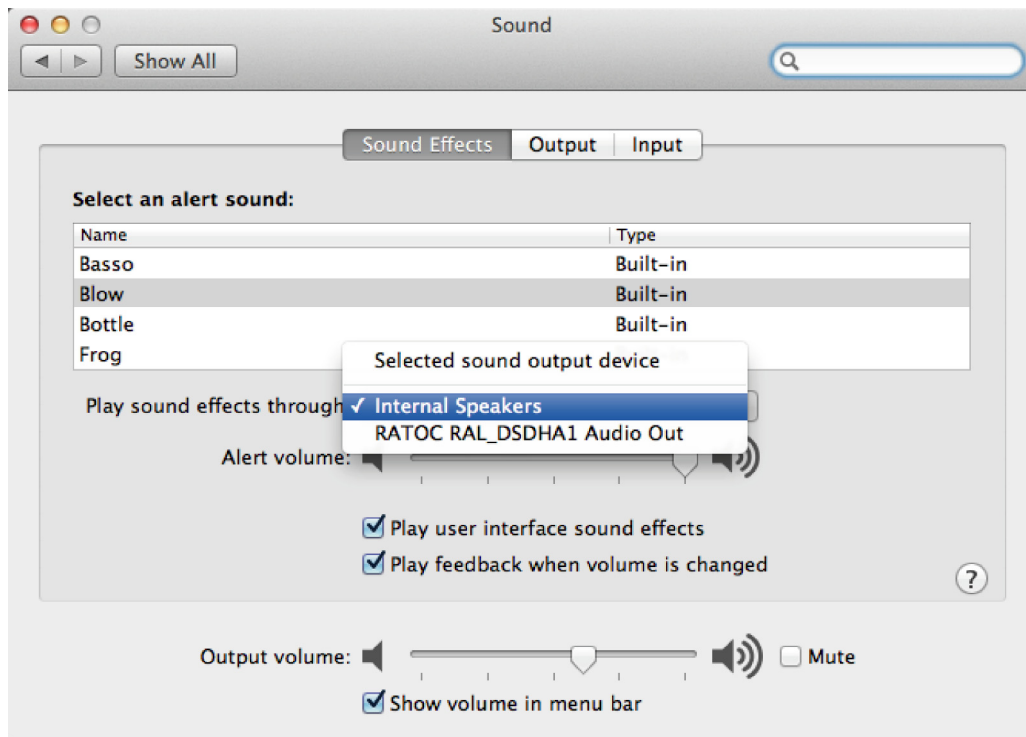The cable should be compliant with USB High-Speed(480Mbps) certification.

MacOS X will detect and recognize RAL-DSDHA1.

(2) Click on the "System Preferences" app on Dock.

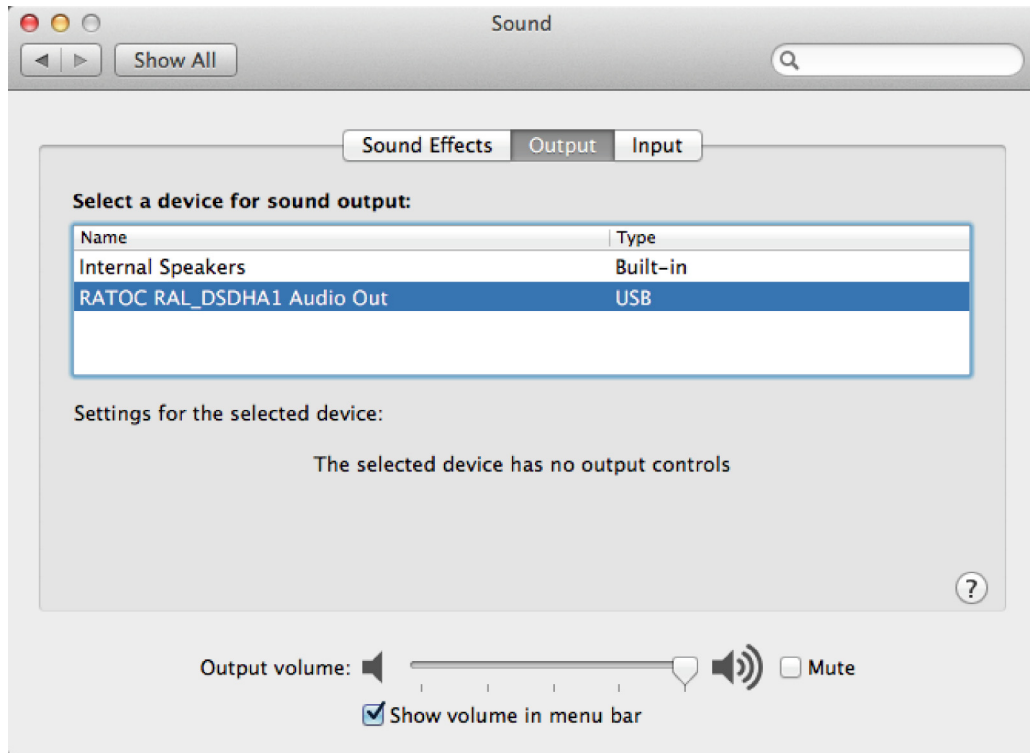(3) Click on the "Sound" icon at the second row:Hardware.

5-2. Setting 'Sound Effects' output to Internal Speakers

Click on the "Sound Effects" tab to prevent alerts and effect sounds such as "e-mail received notification sound" from being routed to Audio System.
Set Play sound effects through 'Internal Speakers'".

5-3. Setting RAL-DSDHA1 as an Audio Output

 Click on the "Output" tab and select "RATOC RAL_DSDHA1 Audio Out".

This selection will route the sound from iTunes or other Audio Applications to your Audio system.

5-4. Setting up 'Audio MIDI Setup' Application

(1) If "Audio Midi Setup" application is not found on Dock, open the Hard Disk icon and
   open the "Applications" folder.
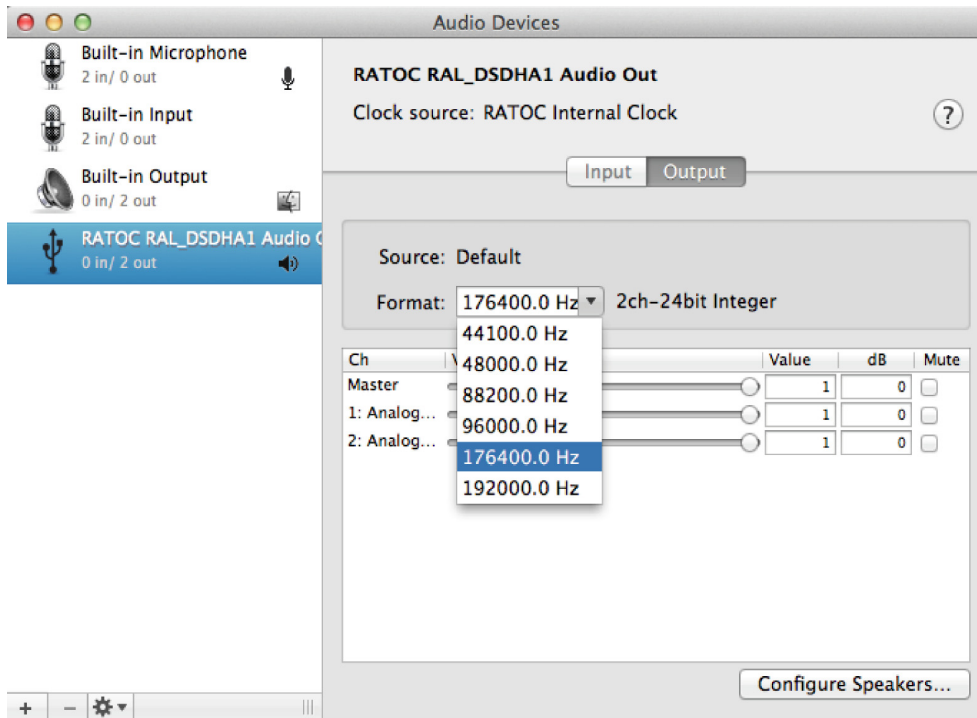   You can find the "Audio Midi Setup" application at the "Utilities" folder.

(2) Open the "Audio Midi Setup" application and select "Audio Devices".

(3) Click on "Output" tab. Select   "RATOC RAL_DSDHA1 Audio Out" for the "Default
   Output" to send the sounds from iTunes or other applications to Audio system.

(4) Select "Built-in Output" for the "System Output" to route system alert sound such as
   "new mail received" sound to built-in speaker.

(5) Select "RATOC RAL_DSDHA1 Audio Out" and then select your desired sample rate
   such as 192000 Hz. at "Format".

If sample rate which is not identical to the sample rate of original music file itself is
selected, MacOS X Audio driver will execute sample rate conversion. As this conversion
will affect audio quality, we recommend to select adequate sample rate which is identical
to one of music file at this field.

5-5. Launch and play iTunes or other Music Player application

Launch iTunes or other Music Player application. Start it and select Music file. You will listen and enjoy fine and clear sound from your Audio system. To learn more about Music Player application, refer to User Guide or Online Help of the application.
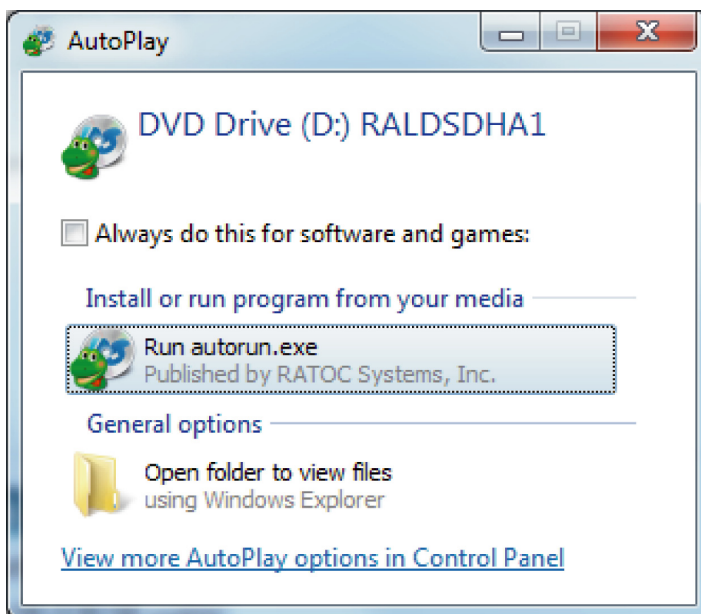
6. Setting up Windows PC (Windows 7)

This chapter describes the driver installation and setting on Windows 7 as an example, these process is almost the same as one on Windows 8, Vista, XP.

Getting started with setting up Windows 7 (32bit or 64bit) PC.
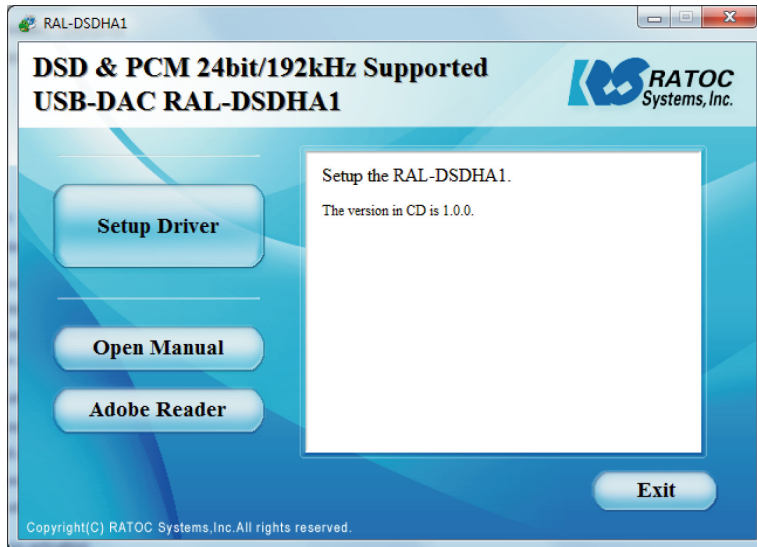
6-1. Installation of USB Audio 2.0 Class Driver

RAL-DSDHA1 requires USB Audio Class 2.0 Driver. You need to install it before using RAL-DSDHA1. If you forgot it or failed to install it, RAL-DSDHA1 would not be configured as a USB Audio Device.
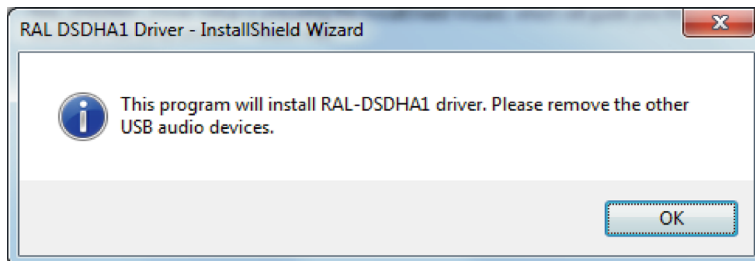
(1) Connect RAL-DSDHA1 to USB 2.0 HS(480Mbps) enabled port on PC.
(2) Log in as an Administrator. You must log in as an Administrator to install USB Audio Class 2.0 Driver.
(3) Insert the bundled CD-ROM to CD-ROM drive.
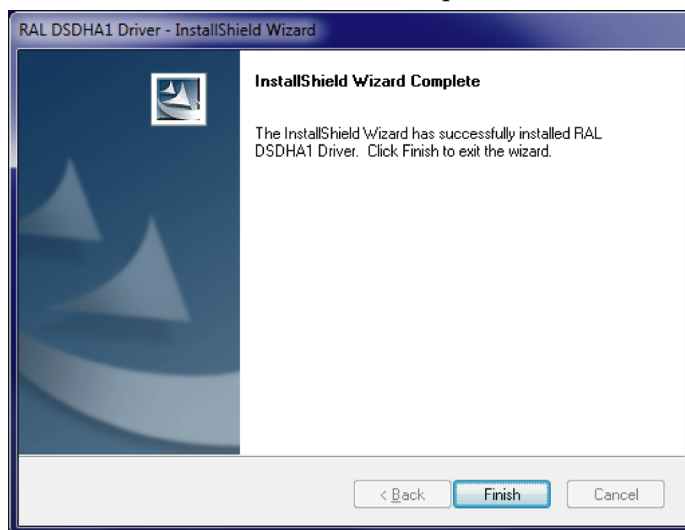(4) If "RAL-DSDHA1 installer" does not start automatically, click auto-run icon of the CD-ROM folder.

(5) The installer will be launched and start automatically. Follow on-screen instructions and select "Setup Driver". If "User account control" dialog box shows up, click "Yes".

(6) Click "Setup Driver" button and get started with the installation.

(7) When this message shows up, remove USB Audio Device except RAL-DSDHA1.
Only one RAL-DSDHA1 should be connected at this time.
Click "OK","Next","Install","Install" to finish the installation.
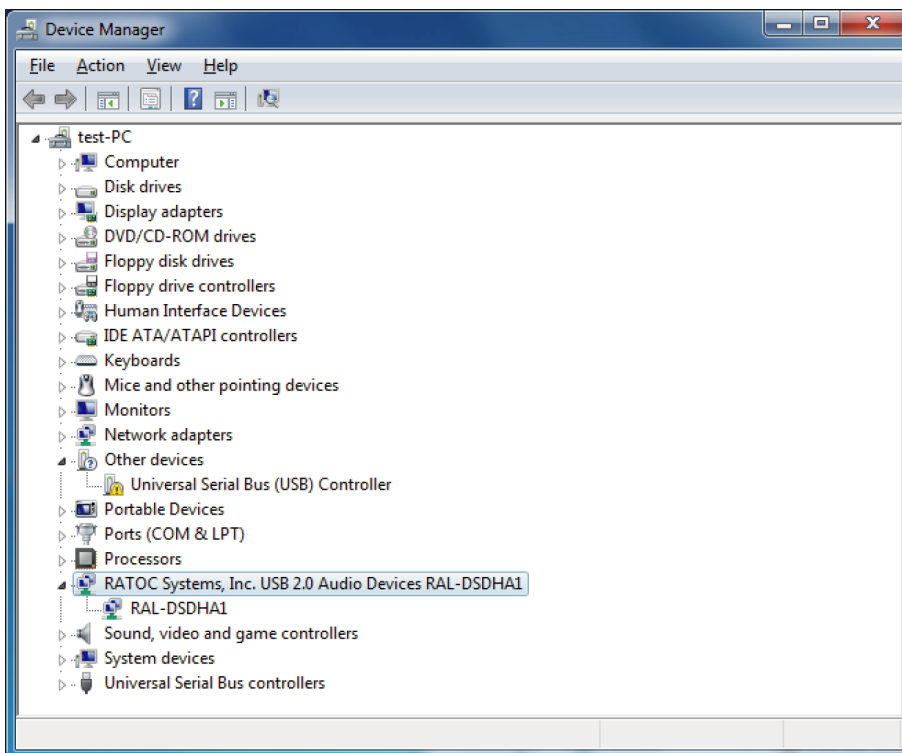

(8) The InstallShield Wizard will complete. Click "Finish".

(9) When all necessary drivers are installed successfully, the installer shows up with "Exit" prompt message. Click "Exit" and quit installation.

(10) Open Device Manager Window and check "RATOC Systems, Inc. USB 2.0 Audio Devices RAL-DSDHA1" are showing up.

(11) Remove RAL-DSDHA1 Set up CD-ROM from the drive.

6-2. Uninstall RAL-DSDHA1 Device Driver

If you failed in RAL-DSDHA1 Driver installation or desire to remove it from your Windows PC, uninstall it and re-install again.

Follow the instructions below.

(1) Insert the bundled CD-ROM into the CD-ROM drive.

(2) If RAL-DSDHA1 installer doesn't start automatically, click "autorun.exe" at CD-ROM folder.

(3) Click "Setup Driver".

(4) Just in case, make sure you will start to uninstall. And then click "Yes."

(5) Click "Finish", remove CD-ROM from the drive and restart Windows System.

7. Grade up setting for Windows

This chapter describes how to improve sound quality and tune up your PC to listen high fidelity and pure sound.

Before installation of Music Player application or additional drivers:

- Check Compatibility and Combination of Sound Drivers and Applications. And select most suitable one for your PC/Mac Audio system. You also need some setting at Device Manager Window to use the application or add-on drivers.

- Set disable to route "System Sound" to your Audio system. Follow steps below:

  (1) Launch "Control Panel" and click on "Sound".

  (2) Select "Built-in Sound card" at the "Playback" tab. Click "Set Default" button to route system sound such as "new mail received" to built-in speaker.

  (3) Select "RAL-DSDHA1" at the "Playback" tab and click "Properties" button.

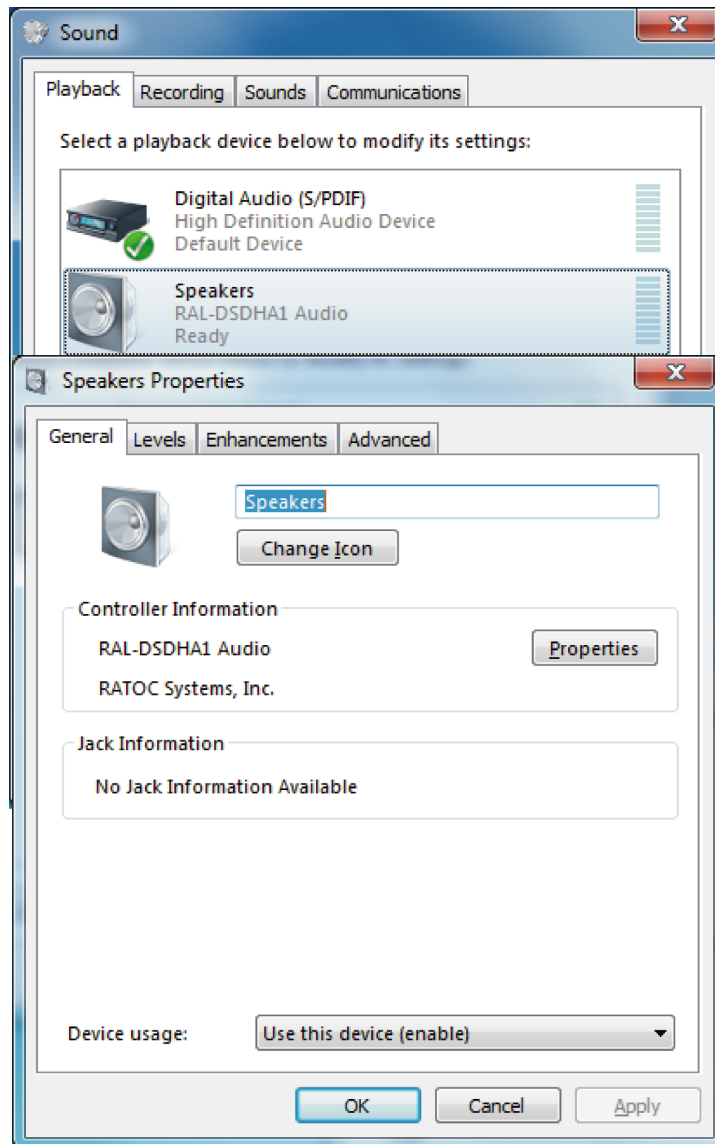 (4) Click "Advanced" tab. And set check mark at both "Allow applications to take exclusive control of this device" and "Give exclusive mode applications priority". These two setting must be set to use our driver, Kernel Streaming or WASAPI mode with Music Player applications. If you would like to use Media Player or iTunes, these applications use Direct Sound or QuickTime Player.

7-1.Listen HD Music with Direct Sound and Kernel Mixer

(1) Double click "RAL-DSDHA1 Audio" at "Playback" tab. Click "Properties" button and open "Speaker Property".
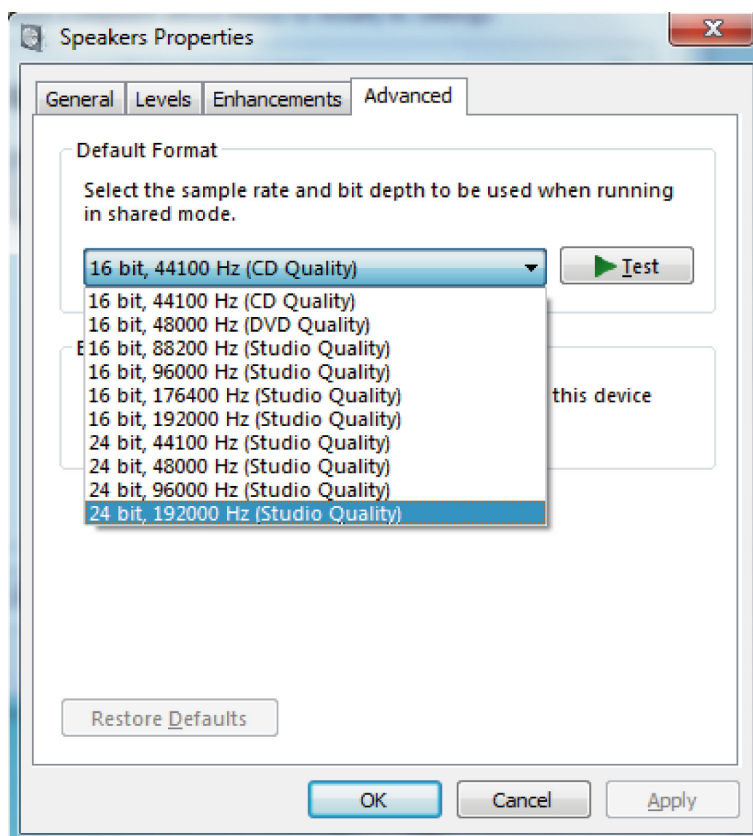

You can change icon and device name as you like.

(2) Click "Advanced" tab and select Sampling Rate/bit rate corresponding to property
   of music files you like at "Default Format" box.
   Note) 24bit/88.2kHz and 24bit/176.4kHz are not shown up at the list.
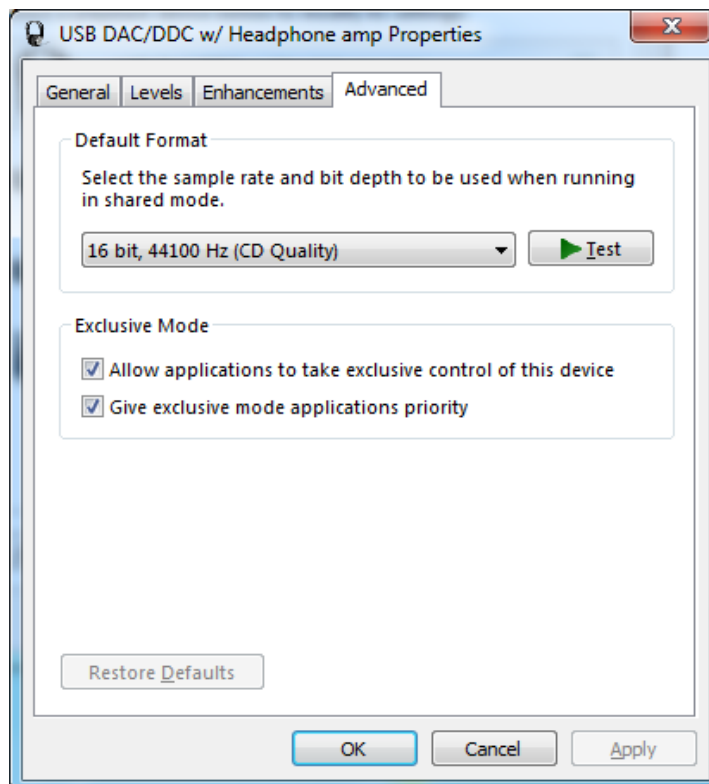   This is the known issue of Windows 7/Vista Direct Sound Driver.

7-2.Using WASAPI mode, skip Kernel Mixer

Windows 8, 7 and Vista(SP1 or newer) includes this function. Once enabled, Windows Kernel Mixer is bypassed and Audio application can pass music data to Audio drivers directly.

** iTunes does not work with WASAPI setting on 64bit Windows 8, 7, Vista.

(1) Click "Start" and launch "Control Panel".
(2) Double click "Sound".
(3) Double click "RAL-DSDHA1 Audio" at "Playback" tab. And click "Properties" button.
(4) Click "Advanced" tab and mark Checkbox of both "Allow applications to take exclusive control of this device" and "Give exclusive mode applications priority" at "Exclusive Mode" box.
(5) Download components suitable for your application such as foobar2000 from the application web site. Install it and follow instructions described at the web page.
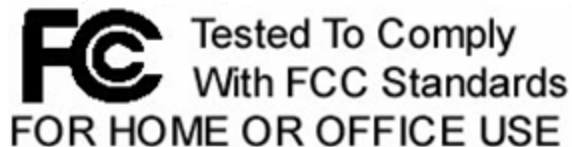
8. Specifications

Name	DSD and HD-PCM ready USB DAC	
Model Number	RAL-DSDHA1	
Inputs	Terminals	USB
	Supported PC	Windows 8, 7, Vista, XP, Mac OS X 10.7 or later. *Windows 64 bit versions are supported.
	Supported Audio Input Format	USB:USB Audio Class 2.0 (Hi-Speed mode is required) DSD 2.8224MHz data with Markers for DoP and standard-compliant. L-PCM24bit/16bit,192kHz/176.4kHz/96kHz/88.2kHz /48kHz/44.1kHz (2ch)
Outputs	Terminals	Analog Stereo Lineout (RCA), Headphones (1/4" phone Jack)
	Supported Audio Devices	Audio devices with analog(RCA) Headphones with a standard stereo plug (16Ω to 600Ω)
	Frequency Characteristics	DC～90 kHz (192 kHz during operation), 10 Hz to 40 kHz (96 kHz when operating), 20 Hz to 20 kHz (44.1 kHz when operating)
	rated output	Headphone output Approx.39 mW × 2 ch @600 ohm(level high) Analog RCA output: 5.7Vrms 10k ohm(MAX), 1.0Vrms 100k ohm, 0.98Vrms 10 ohm
Power-supply Voltage	DC +12.0V(with AC adapter)	
Unit Dimensions/Weight	Approx. 133 (W) x 160 (D) x 43 (H) mm/ Approx. 0.615 kg (not including protrusions)	

9. FCC Declaration

*As of 12/Feb/2013, FCC test is under application.

RATOC Systems, Inc.   RAL-DSDHA1

FCC Tested To Comply With FCC Standards FOR HOME OR OFFICE USE

-FCC Statement-

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

(1) Reorient or relocate the receiving antenna.

(2) Increase the separation between the equipment and receiver.

(3) Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

(4) Consult the dealer or an experienced radio/TV technician for help.

Changes or modifications not expressly approved by the party responsible for compliance may result in this unit not complying with FCC Rules Part 15.