

RAL-24192DM1 Setup Guide

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1. Introduction

Thank you for your purchasing RAL-24192DM1. We are confident that you will enjoy listening High Definition music with it. RAL-24192DM1 gets Digital Music stream from PC or Mac through USB 2.0 High-Speed (480Mbps) port and converts it to Analog Stereo Signal with well-established Multi Bit DAC(PCM1704). The DAC chips are controlled by our original software and work with low-jitter Bit-Clock which is provided by dedicated X-tal Audio Master Clock generator modules (22.5792MHz and 24.576MHz).

RAL-24192DM1 has two independent Digital Audio input supports up to 32bit/192kHz High Definition Liner PCM audio stream. Also it has three Analog Audio output. The first one is Audio stereo Line Output through RCA jacks, the second one is Analog Stereo Line Output through AES connector and the last one is a Stereo Headphone Output at the front panel.

You can enjoy HD sound with RAL-24192DM1 with minimum Audio System personally consists of PC/Mac and high class headphone. If you have an excellent legacy Audio amplifier, RAL-24192DM1 provides a good sound to you.

1-1. Features:

- Fully compatible with USB 2.0 (High Speed 480Mbps) Specification. And requires High Speed operation.
- USB 2.0 EHCI Isochronous High-Band Width mode allows 32bit/192kHz with USB Audio Class 1.
- Fully compatible with USB Audio Class 1.0 Driver. This brings add-on driver installation free for customers.
- Accepts 24bits/32bits, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz and 192kHz.
- Uses Sign Magnitude 24bit/192kHz Multi bit D/A Convertor chip (PCM1704).
- Includes wide range frequency response headphone amplifier.
- OCL (GND reference) headphone amplifier provides clear and pure sound.
- Includes powerful headphone amplifier, it provides 50mW/68-Ohm each Ch..
- Use 32bit parallel processor and multi thread operation. Low overhead software provides noise-free, clear and rich music.

2. System requirements

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

- One USB 2.0 High Speed(480Mbps) enabled Host port.

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-24192DM1. Refer User Guide, Instruction Guide or Online Help of these Applications.

2-2. MacOS X 10.7.x (Lion) or 10.6.8 or newer.

- One USB 2.0 High Speed(480Mbps) enabled Host port.

Note) The knowledge and experience regarding 'Audio MIDI Setting', 'System Preference', Audio Music Player application such as iTunes are required to use RAL-24192DM1. And utilities such as 'Bitperfect' or CD Ripping applications are very useful to enjoy High Definition Music with RAL-24192DM1. Refer User Guide, Instruction Guide or Online Help of those Applications.

2-4. Audio equipment with S/PDIF output.

- RAL-24192DM1 has one Coaxial S/PDIF compliant RCA(75Ohm) input. It accepts 16bit/44.1kHz , 16bit/48kHz, 16bit/88.2kHz, 16bit/96kHz, 16bit/176.4kHz 16bit/192kHz, 24bit/44.1kHz, 24bit/48kHz, 24bit/88.2kHz, 24bit/96kHz, 24bit/176.4kHz and 24bit/192kHz.
- You can select S/PDIF input or USB input with Mode Switch at the front panel.

2-5. Stereo Headphone

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

2-6 Stereo Amplifier

- Equipped stereo line input (RCA) or AES input.

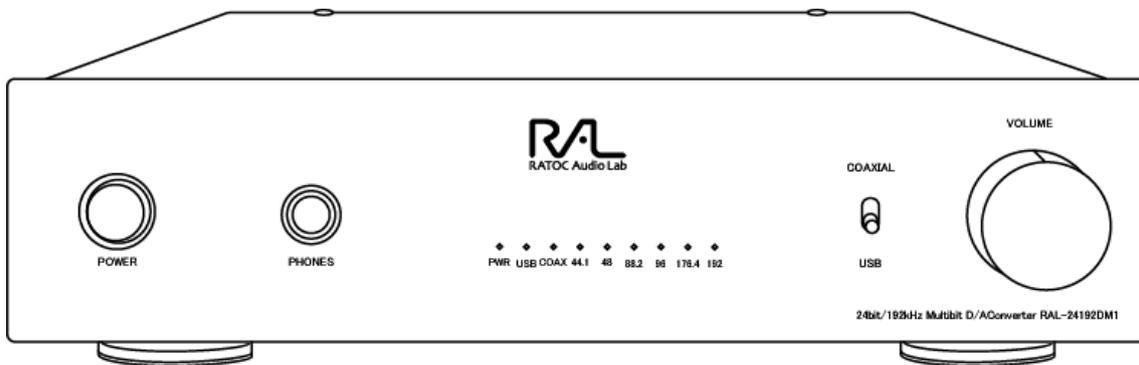
3. Package contents.

RAL-24192DM1 package includes:

- RAL-24192DM1
- USB Cable (1m) with USB High Speed Compliant Logo.
- RAL-24192DM1 Setup Guide

4.1 Front Panel, Rear Panel Layout.

4-1. Front Panel



[PHONES] ---- Headphone Output Jack for 6.35mm(1/4") phone plug.

[VOLUME] ---- Output level control for Headphone..

LED indicators

[USB] ---- lights on at RAL-24192 being configured as a USB Audio Device.

[44.1] ---- lights on to indicate 44.1kHz sampling rate is detected.

[48] ---- lights on to indicate 48kHz sampling rate is detected.

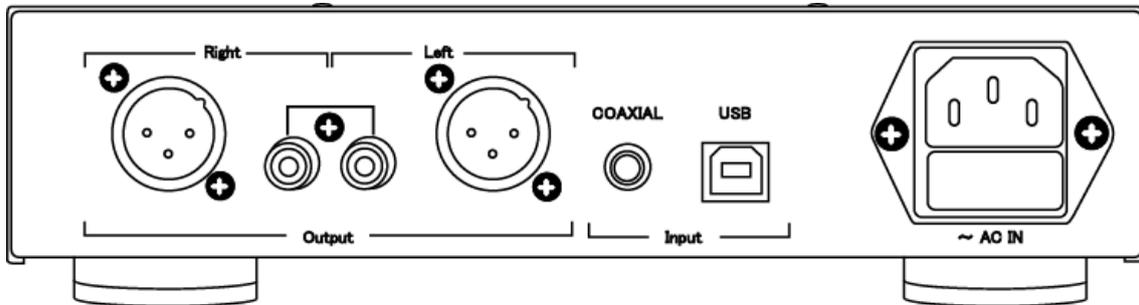
[88.2] ---- lights on to indicate 88.2kHz sampling rate is detected.

[96] ---- lights on to indicate 96kHz sampling rate is detected.

[176.4] ---- lights on to indicate 176.4kHz sampling rate is detected.

[192] ---- lights on to indicate 192kHz sampling rate is detected.

4-2. Rear Panel



[AC IN]

External Power input inlet. AC 100V to 115V. To use AC 200V to 220V, the internal setting must be required.

[USB]

Connect to USB-A port of PC or Mac with USB 2.0 High Speed(480Mbps) compliant cable.

[Digital Audio In : COAXIAL]

S/PDIF Coax digital audio input port.

Input impedance 75-Ohm, 0.5Vp-p S/PDIF signal. Accepts 16bit or 24bit/44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz or 192kHz Linear PCM format.

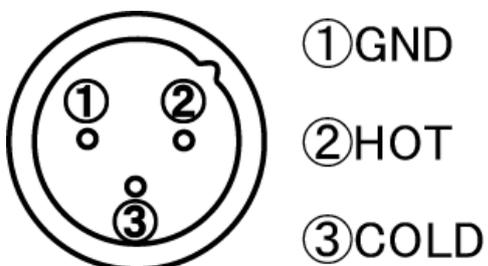
This signal is isolated by Isolation Transformer.

[Line Out]

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

RCA : 2Vrms/ch.

AES : 1.87Vrms/ch.



5. Setting up Mac/MacOS X.

5-1. Connecting RAL-24192DM1 to Mac USB port.

Getting start setting up your Mac / MacOS X 10.6.8, 10.7.x (Lion) or newer.

(1) Connect RAL-24192DM1 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-24192DM1. And then install USB Audio Class driver automatically for RAL-24192DM1.

(2) Click on the “System Preference” 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” are routed to Audio System.

Set “Play alerts and sound effects through ‘Internal Speakers”



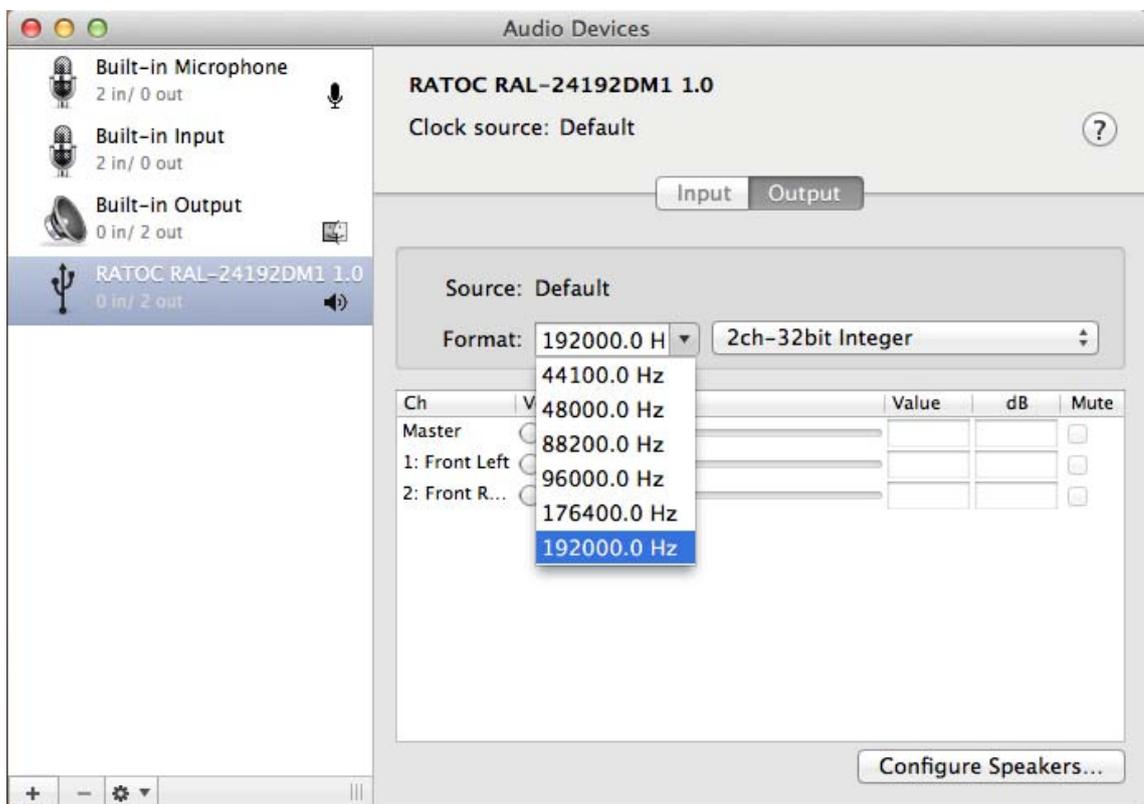
5-3. Setting RAL-24192DM1 as an Audio Output.

Click on the “Output” tab and select “RATOC Systems, Inc. RAL-24192DM1”. 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, select the “Finder” application. Select “Places – Applications”, scroll down the list and click on the “Utilities” folder. Find “Audio MIDI Setup.app” and drag it down to Dock.
- (2) Open the “Audio MIDI Setup” application and select “Audio Devices”.
- (3) Click on “Output” tab. Select “RAL-24192DM1” 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 “RAL-24192DM1” at “Properties For:” drop-down list. And then select your desired sample rate such as 192000 Hz. “2ch.-32bit” is required for RAL-24192DM1. 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.

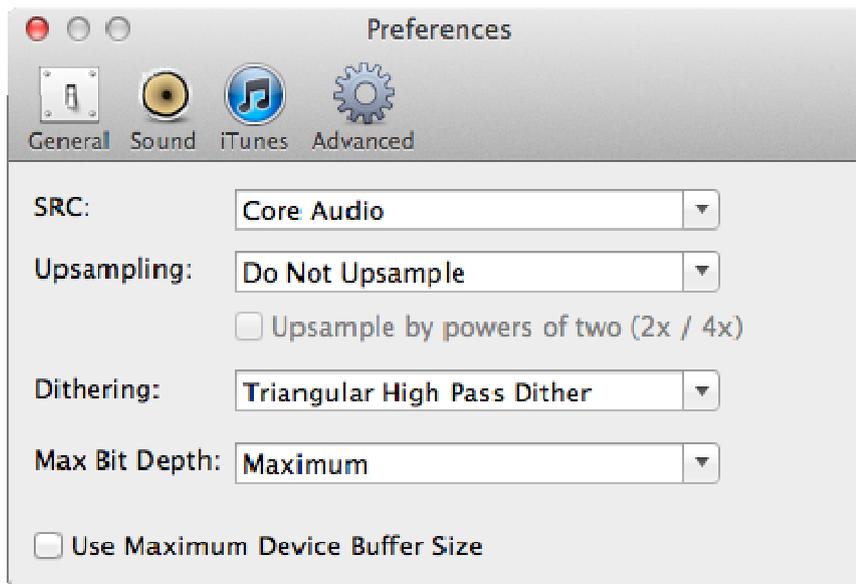


5-5. Launch and play iTunes or other Music Player application.

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 User Guide or Online Help of the application.

5-6. Tips for 'Bitperfect'

'Bitperfect' is a famous and powerful Plug-in software for iTunes. It brings playing back music with original sampling rate. But MacOSX driver divides 24/176.4kHz music data to two odd size isochronous packet. This odd size packet causes some noise. To prevent this noise, please set 'Max bit Depth' to 'Maximum' at 'Bitperfect' Preference' shown below.

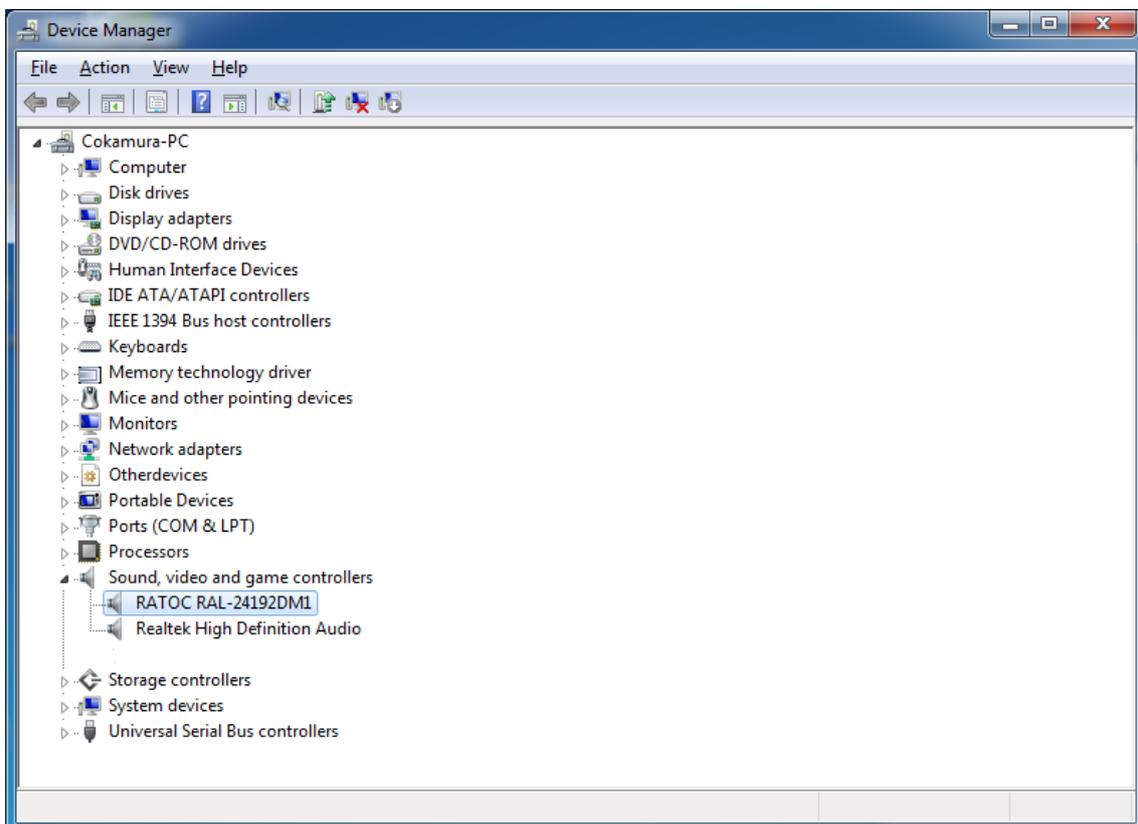


6. Setting up Windows PC.

You don't need to install some software such as drivers and utilities before hooking up TAL-24192DM1 to your PC. Because RAL-24192DM1 works with USB Audio Class 1 driver and USB 2.0 High-Speed EHCI driver and both drivers are already included Windows 7, Vista and XP in default. This means just Plug & Play High Definition Music.

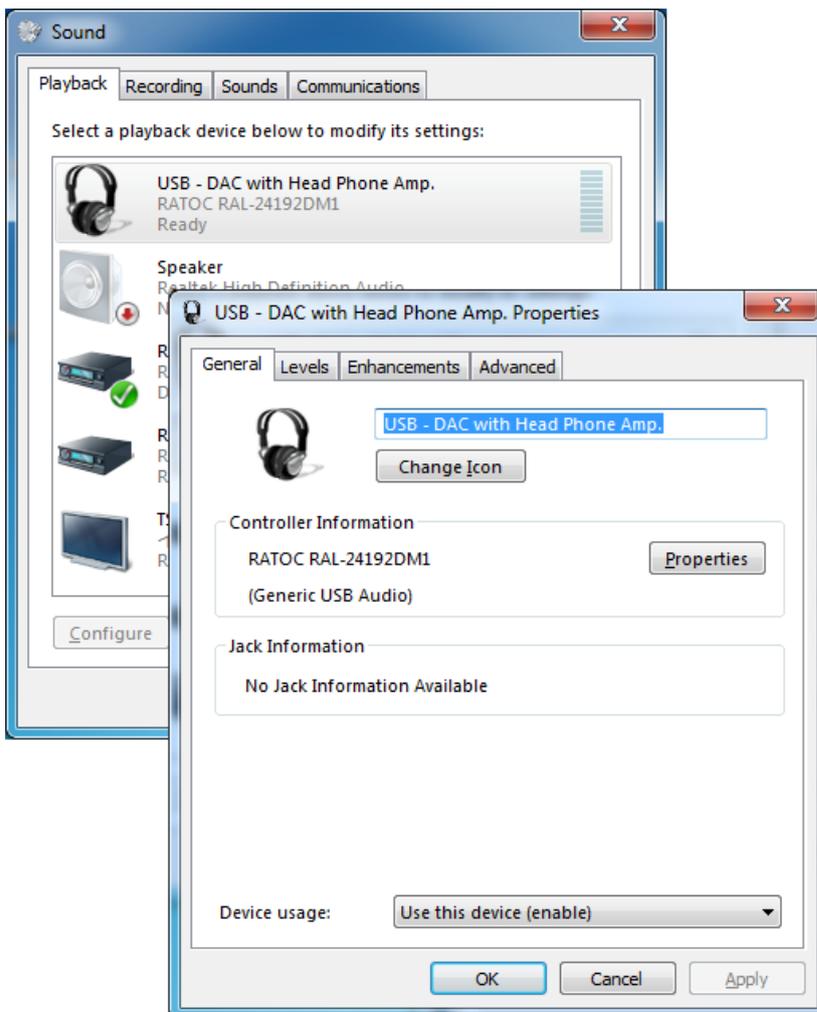
6-1. Connect RAL-24192DM1 to your Windows PC.

- (1) Prepare USB 2.0 High Speed compliant cable and connect RAL-24192DM1 USB-B port at rear panel to USB-A High-Speed enabled port at PC.
- (2) launch 'Control Panel' and double click 'System'.
- (3) Double click 'Device Manager'.
- (4) Check 'RATOC RAL-24192DM1' is shown up underneath 'Sound, Video and Game controllers' without yellow '!' mark, '?' mark or red 'X' mark.



6-2. Check 'Sound Device' and Test.

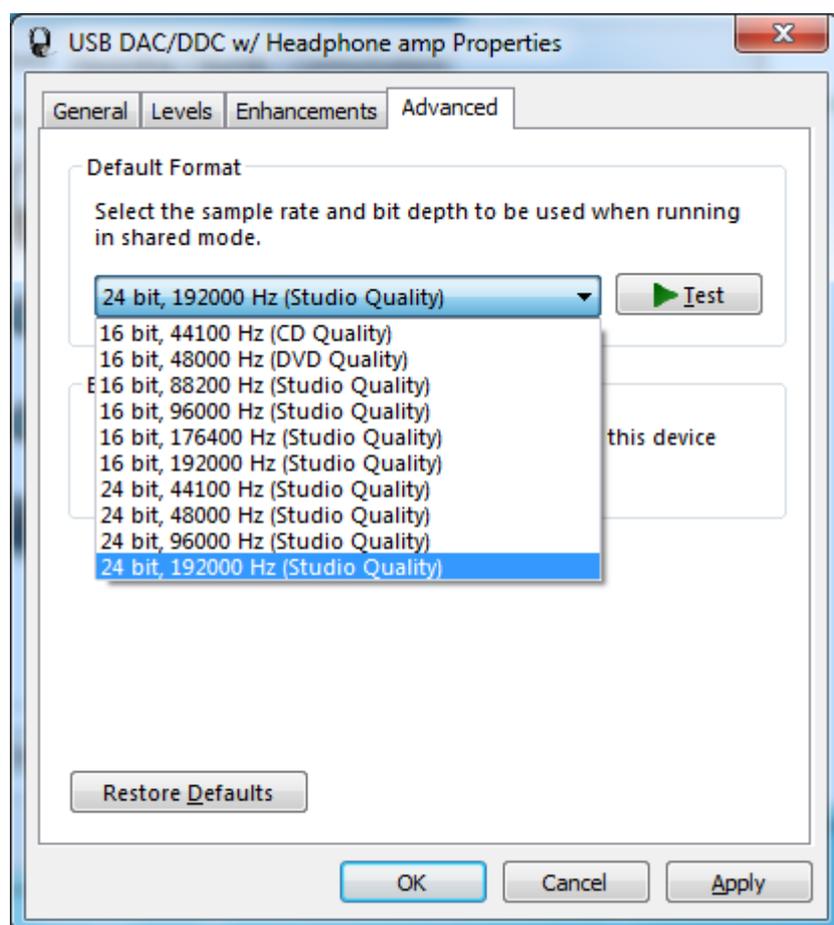
- (1) Launch "Control Panel" and click on "Sound".
 - (2) Select "Built-in Sound card" at the "Playback" tab. Click "Set Default" button to route system sound such as "new mail received" to built-in speaker.
 - (3) Select "RAL-24192DM1" at the "Playback" tab and click "Properties" button.
 - (4) Click "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 ASIO4ALL driver 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.
- Note) You can change icon and device name as you like.



- (5) Click 'Advanced' tab and select Sampling Rate/bit rate correspond to property of music files you like at 'Default Format' box.
- (6) Click 'Test' button, you can listen and check test sound with selected sampling rate from speakers or headphone.

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.



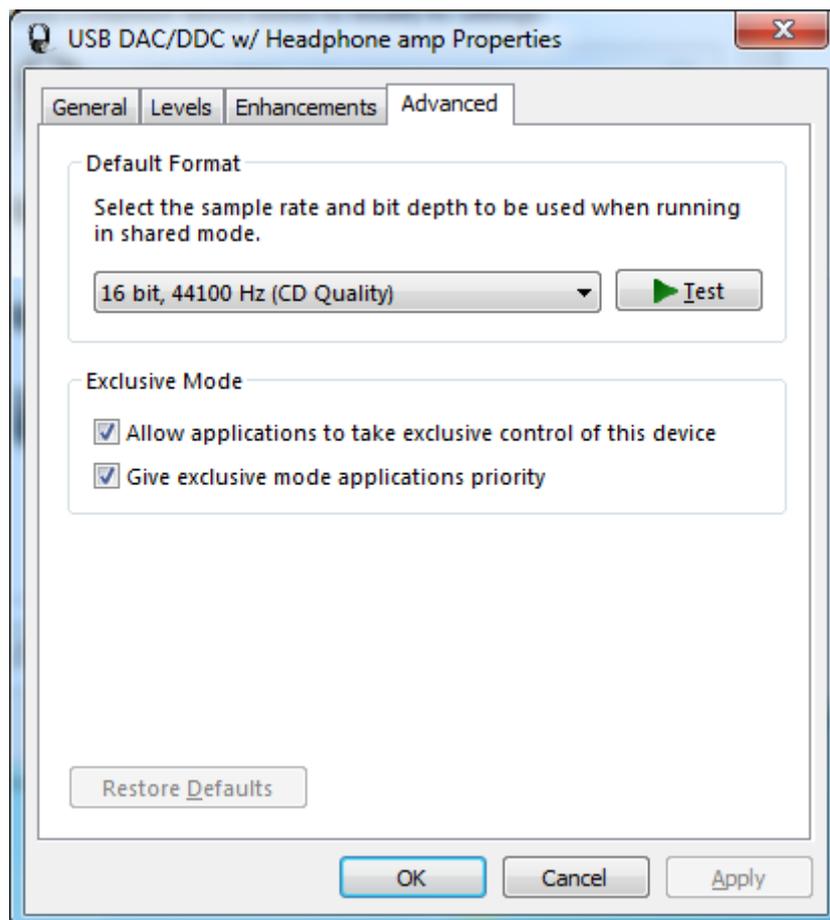
- (7) If you use Media Player or iTunes, those Music Players use this Default Format, For example, if Default Format is set as '24bit, 192kHz' and original format is 16bit/44.1kHz, Direct Sound drivers or QuickTime drivers executes sampling rate conversion (up sampling) and plays back at 24bit/192kHz.

6-3 Listen HD Music with WASAPI mode and skip Kernel Mixer.

Windows7 and Vista (SP1 or newer) includes WASAPI mode. Once enabled, Windows Kernel Mixer is bypassed and Audio application can pass music data to Audio drivers directly and we can listen more clear sound.

** iTunes does not work with WASAPI setting on 64bit Windows7 or Windows Vista.

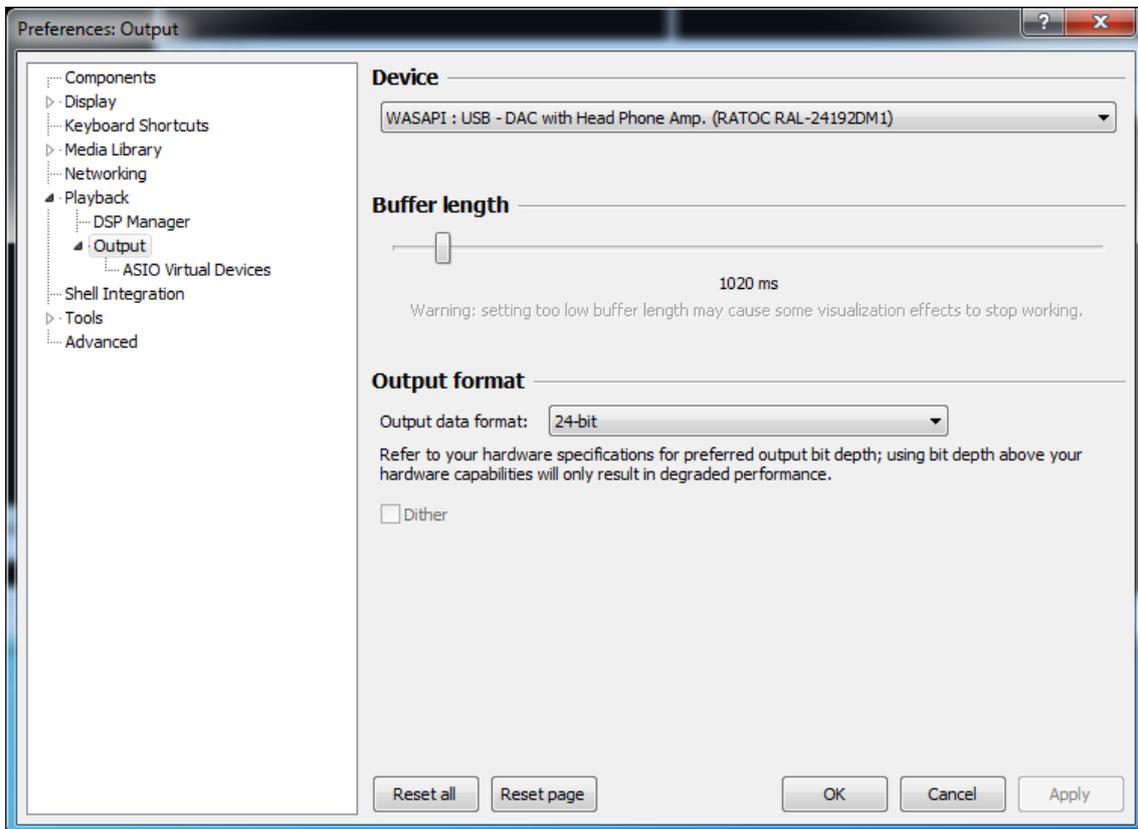
- (1) Click 'Start' and launch 'Control Panel'.
- (2) Double click 'Sound'.
- (3) Double click 'RAL-24192DM1 Audio' at 'Playback' tab. And click 'Properties' button.
- (4) Click 'Advanced' tab and mark Checkbox of both 'Allow applications to take exclusive control of this device' and 'Give exclusive mode applications priority' at 'Exclusive Mode' box.



6-4 Installation and setting application example foobar2000.

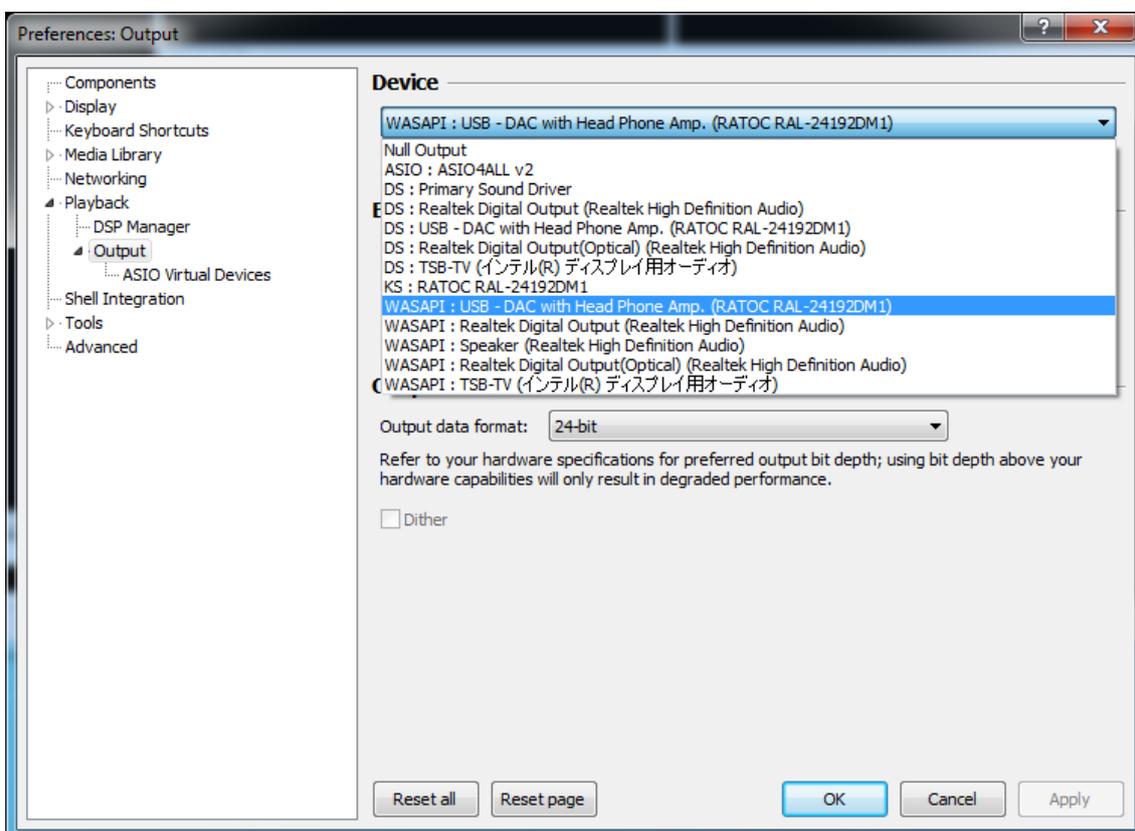
The foobar2000 is a famous and very popular application running on Windows PC. This chapter describes how to setup the application running on your system.

- (1)Download from the latest stable version of foobar2000 from www.foobar2000.org and install it into your Windows system.
- (2)If you would like to skip Kernel Mixer and use WASAPI mode, you need to download optional component 'WASAPI output support' from Optional Component page and install it. Check WASAPI mode enabled or not at 'Control Panel-Sound-Properties'. Refer chapter '*7.2 Using WASAPI mode, skip Kernel Mixer*'.
- (3)Launch 'foobar2000' and click 'File'. Select 'Preferences' and open 'Preferences' dialog box..



- (4) Select 'Playback → Output'. Select RAL-2496DM1 at Devices list as follows.
 - If you will use Direct Sound,

- select 'DS:USB DAC/DDC w/ Headphone amp(RAL-24192DM1 Audio)'.
- If you will use WASPI mode,
- select 'WASAPI: USB DAC/DDC w/ Headphone amp(RAL-24192DM1 Audio)'.



(5) Set Buffer length to proper value.

If the buffer length is too long or short, some noisy sound are mixed over a music.
Set 900ms to 1,100ms, but this value is depend on Processor speed or other application software running at the same time.

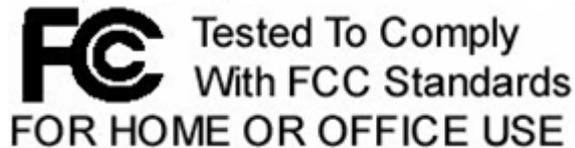
(6) Click 'OK' and close dialog box. Select Music Library and start it.

Refer www.foobar2000.org to learn more about foobar2000.

7. FCC Declaration

Note) RAL-24192DM1 is in inspection stage as of 10/July/2012.

RATOC Systems, Inc. RAL-24192UT1



-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.