RAL-DSDHA1 Setup Guide

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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
$\textbf{[USB]}\cdot\ \cdot\ \cdot$ Comes on at RAL-DSDHA1 being configured as a USB Audio Device
$[DSD] \cdot \cdot \cdot Comes$ 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.

- 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'".

00	Sound	
◄ ► Show All	Q	
Select an alert sound:	Sound Effects Output Input	
Name	Туре	
Basso	Built-in	
Blow	Built-in	
Bottle	Built-in	
Frog	Selected sound output device	
Play sound effects through Alert volume	 ✓ Internal Speakers RATOC RAL_DSDHA1 Audio Out ✓ Play user interface sound effects ✓ Play feedback when volume is changed 	?
Output volume	e:	

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.

⊖ ⊖ ♦ ▶ Show All	Sou	Ind	
	Sound Effects	Output Input	
Select a device for sou	ind output:		
Name		Type	
Internal Speakers		Built-in	
RATOC RAL_DSDHA1 A	udio Out	USB	
Settings for the selecte	d device:		
	The selected device h	as no output controls	
	The selected device h	as no output controls	
			?
Output vo	lume: 🛋 👘		
	Show volume	in menu har	
	Show volume		

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.

000	Audio Devices	
Built-in Microphone 2 in/ 0 out Built-in Input 2 in/ 0 out	RATOC RAL_DSDHA1 Audio Out Clock source: RATOC Internal Clock	?
Built-in Output 0 in/ 2 out	Input Output	
RATOC RAL_DSDHA1 Audio (0 in/ 2 out	Source: Default Format: 176400.0 Hz 2ch-24bit Integer 44100.0 Hz 48000.0 Hz 88200.0 Hz 96000.0 Hz 1: Analog 2: Analog 176400.0 Hz 192000.0 Hz	dB Mute 1 0 1 0
+ - 🌣	Configu	ire Speakers

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.

RAL-DSDHA1 DSD & PCM 24bit/192kHz Supported USB-DAC RAL-DSDHA1 Correct Systems, inc.		RATOC Systems, Inc.
Setup Driver Open Manual Adobe Reader	Setup the RAL-DSDHA1. The version in CD is 1.0.0.	
Copyright(C) RATOC Systems,Inc.All rights re	iserved.	Exit

(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.

RAL DSDHA1 Driver - InstallShield Wizard	x
This program will install RAL-DSDHA1 driver. Please remove the other USB audio devices.	
ОК	

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

RAL DSDHA1 Driver - InstallShield Wizard		
	InstallShield Wizard Complete The InstallShield Wizard has successfully installed RAL DSDHA1 Driver. Click Finish to exit the wizard.	
	< Back Finish Cancel	

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

© RAL-DSDHA1 DSD & PCM 24bit/192 USD D 1 C D 1 L	kHz Supported	RATOC
USB-DAC RAL-DSDH	Al	Systems, Inc.
Setup Driver Open Manual Adobe Reader	Select an item from the menu.	
Copyright(C) RATOC Systems,Inc.All rights re	served.	Exit

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

File Action View Help Image: State of the state of th	🚔 Device Manager	_ D _ X
 test-PC Disk drives Display adapters DVD/CD-ROM drives Floppy disk drives Floppy drive controllers Floppy drive controllers Floppy drive controllers Mice and other pointing devices Monitors Network adapters Other devices Monitors Portable Devices Ports (COM & LPT) Processors RATOC Systems, Inc. USB 2.0 Audio Devices RAL-DSDHA1 Sound, video and game controllers System devices Universal Serial Bus controllers System devices Universal Serial Bus controllers 	<u>File Action View H</u> elp	
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> Mice and other pointing devices > Monitors > Network adapters Other devices Universal Serial Bus (USB) Controller > Portable Devices > Portable Devices > Portable Devices > Ports (COM & LPT) > Processors RAL-DSDHA1 > Sound, video and game controllers > System devices > Universal Serial Bus controllers	Keyboards	
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 	RAL-DSDHA1	
⊳ -∰ System devices ⊳ - ∯ Universal Serial Bus controllers	Sound, video and game controllers	
⊳ ♥ Universal Serial Bus controllers	⊳ 📲 System devices	
	🔈 🏺 Universal Serial Bus controllers	

(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".

🔅 Sound
Playback Recording Sounds Communications
Select a playback device below to modify its settings:
Digital Audio (S/PDIF) High Definition Audio Device Default Device
Speakers RAL-DSDHA1 Audio Ready
Speakers Properties
General Levels Enhancements Advanced
Speakers Change <u>I</u> con
Controller Information
RAL-DSDHA1 Audio
RATOC Systems, Inc.
Jack Information
No Jack Information Available
Device usage: Use this device (enable)
OK Cancel Apply

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.

Speakers Properties
General Levels Enhancements Advanced
Default Format
Select the sample rate and bit depth to be used when running in shared mode.
16 bit, 44100 Hz (CD Quality)
16 bit, 44100 Hz (CD Quality) 16 bit, 48000 Hz (DVD Quality)
E16 bit, 88200 Hz (Studio Quality) 16 bit, 96000 Hz (Studio Quality)
16 bit, 176400 Hz (Studio Quality) this device 16 bit, 192000 Hz (Studio Quality)
24 bit, 44100 Hz (Studio Quality) 24 bit, 48000 Hz (Studio Quality)
24 bit, 96000 Hz (Studio Quality) 24 bit, 192000 Hz (Studio Quality)
Bastara Defaults
OK Cancel Apply

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.

USB DAC/DDC w/ Headphone amp Properties			
General Levels Enhancements Advanced			
Default Format			
Select the sample rate and bit depth to be used when running in shared mode.			
16 bit, 44100 Hz (CD Quality)			
Exclusive Mode			
Allow applications to take exclusive control of this device			
Give exclusive mode applications priority			
Particip Defaults			
OK Cancel Apply			

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	USB:USB Audio Class 2.0	
	Input Format	(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 with analog(RCA)	
	Audio Devices	Headphones with a standard stereo plug	
		(16Ω to 600Ω)	
	Frequency	$ m DC{\sim}90~ m kHz$ (192 kHz during operation),	
	Characteristics	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)	
		l	

9. FCC Declaration

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



-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.