exaSound

e68 Digital to Analogue Converter

Owner's Manual

PLEASE READ BEFORE OPERATION

USB DSD 12.28MHz
e68   -3.0dB

DSD Direct Stream Digital **DXD** Digital eXtreme Definition

8-Channel DSD256/12.288 MHz   Stereo DSD512/24.576 MHz   PCM 32bit/384 kHz

REV. 1.3 – 01/2021

Table of Contents

Welcome

Thank you for purchasing the exaSound e68 DAC!

e68 is a dual-purpose digital to analogue converter - multichannel DAC capable of playing up to 8-chanels DSD256 and stereo DAC with support for DSD512.

e68 features proprietary asynchronous USB streaming, ASIO and Core Audio drivers and FPGA core to achieve 32bit, low-jitter, bit-perfect signal path.

e68 is a Roon Tested DAC. It has been profiled and tested by both Roon Labs and exaSound for maximum compatibility and best user experience with Roon.

e68 has vanishingly low jitter, distortion and noise levels, and astonishingly clean natural sound. Seamless integration with exaSound streamers and music serves offers outstanding user experience and reliability.

We hope that the e68 DAC will help you to enjoy world-class music experience for years to come. Please take a few minutes to read right through this manual. Investing a little time now is the best way to ensure that you make the most of your investment.

Your satisfaction is our highest priority.

Happy listening,

exaSound Audio Design
www.exaSound.com
CustomerService@exaSound.com

Quick Start Guide

Package Contents

The following items should be in the box:

- e68 DAC
- Power supply (may be supplied separately)
- A-B USB cable
- IR Remote Control

Proper Device Placement

Place the device on a stable solid base, far from heat sources. Do not expose the device to direct sunlight. Allow at least 2.5 cm (1") around the device for ventilation. Do not place the device on fabrics, inside enclosed space, or in contact with curtains. Do not place the device on top of power amplifiers or any other equipment that emits heat. Do not expose the unit to smoke, humidity, moisture and water. Do not stack exaSound devices one on top of the other.

Keep the length of analogue interconnects and speaker cables short for optimal sonic performance. Remember that cables act as filters. Shorter cables have less impact on sonic performance. The shorter the cables, the more transparent they become.

⚠	Before using the device, please check the safety instruction on Page 34.

Front Panel Controls
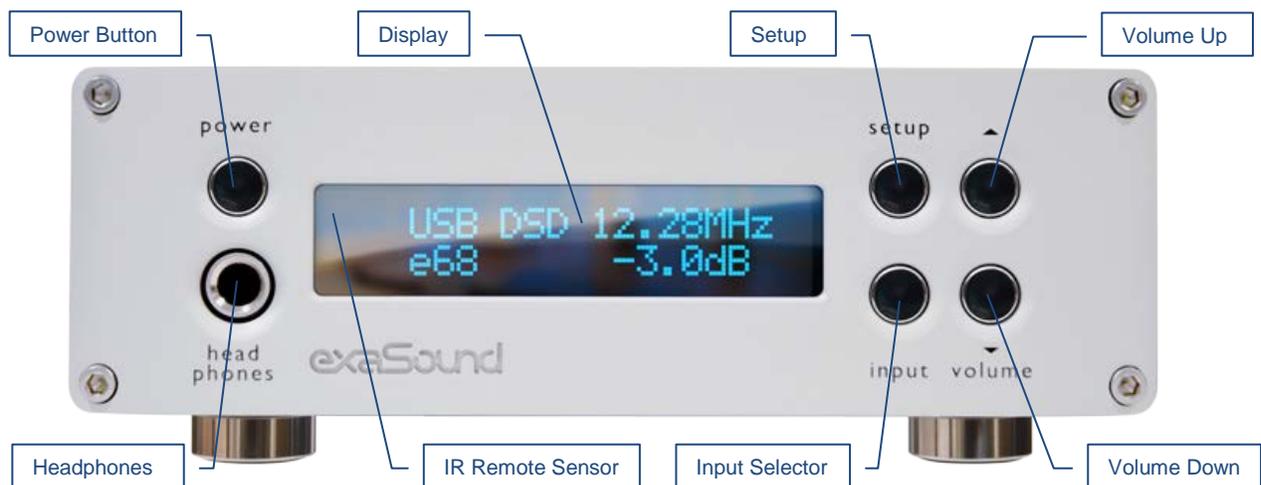
Headphones accepts a standard 1/4-inch stereo single-ended phone plug. Use a suitable adapter for headphones equipped with a different plug.

Rear Panel Connectors
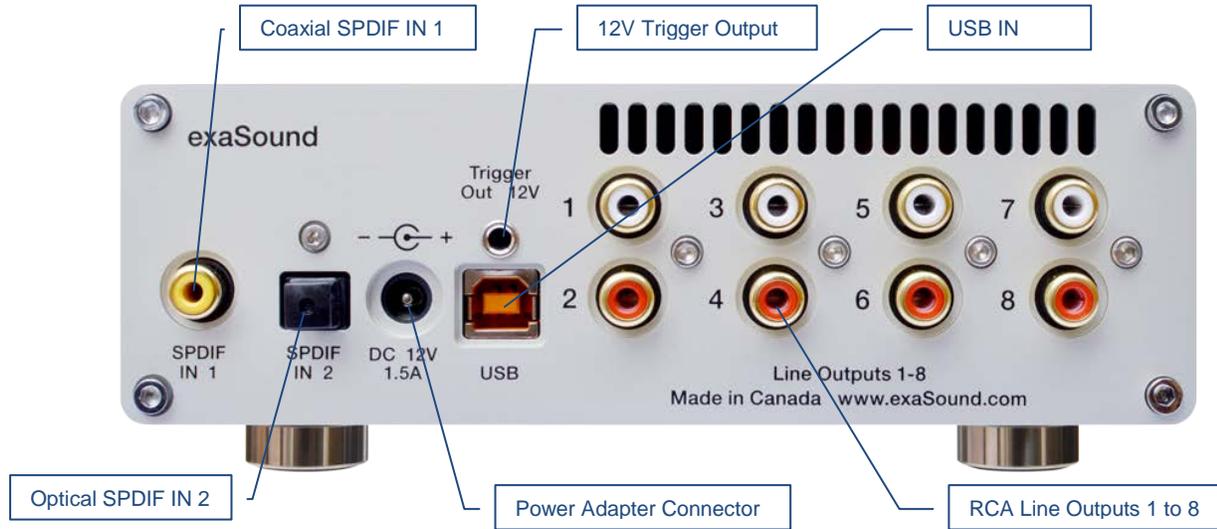
SPDIF IN1 - Coaxial SPDIF Input
SPDIF IN2 - Optical TOSLINK Input
DC 12V / 1.5A - Power Adapter Connector
5.5mm Outside / Inside Diameter
USB - USB Input

Line Outputs 1-8 - RCA Unbalanced Analogue outputs
12V Trigger Output - use to activate trigger-enabled equipment

Infrared Remote Control
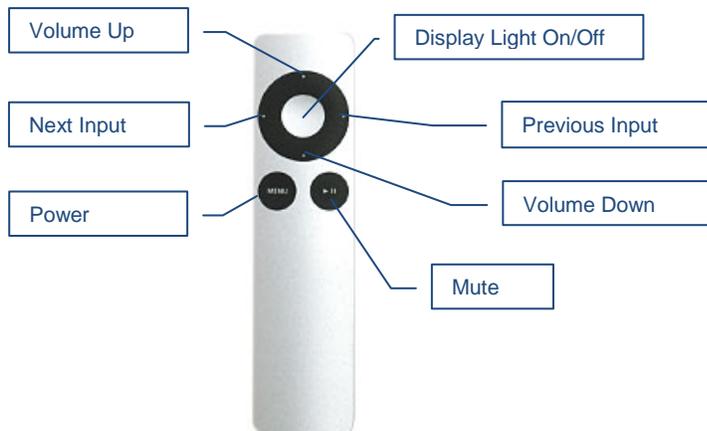
Your unit is programmed to work with the supplied remote control.

The e68 DAC can be re-programmed to work with most infrared remote controls using Sony and NEC IR protocols, for example the Sony RM-EZ4 Universal Remote, or Apple remote control.

See the *IR Remote Control Setup* section for instructions on how to change button assignments and how to pair a different remote control with your e68 DAC.

Using the e68 DAC with exaSound Streamers and Music Servers

1. The e68 DAC is ready for plug-and-play operation with exaSound streamers and music servers.
2. Connect the e68 DAC with your streamer or music server with the provided USB cable.
3. Follow the instructions for your exaSound streamers or music server.

Windows ASIO Driver Setup

1. Use the username / password that we've emailed you with the shipping confirmation email to login to support.exasound.com.
2. Download and unzip the latest **exaSound Windows ASIO Driver**.
3. Run *exaSound-N1-5-3-39-Setup.exe (or later version)* and follow the prompts. ASIO drivers step-by-step setup instructions are available in this guide.
4. Reboot your computer.
5. Setup your ASIO compatible player (Roon, J. River Media Center, HQPlayer etc.) to use the exaSound ASIO driver. Check the *Guides* section of the exaSound blog for step-by-step player configuration instructions: exasound.com/Blog.aspx.
6. Click on the *exaSound Dashboard* Icon next to the clock on the Windows System Tray and set the master volume.

exaSound Dashboard (Windows)

Channel View — Channel Volume — Input Selector — View Selector — Close Button — Master Volume

Channel View

Minimised View

Channel Labels — Mute Button — Sampling Rate

System Tray

exaSound Dashboard Icon
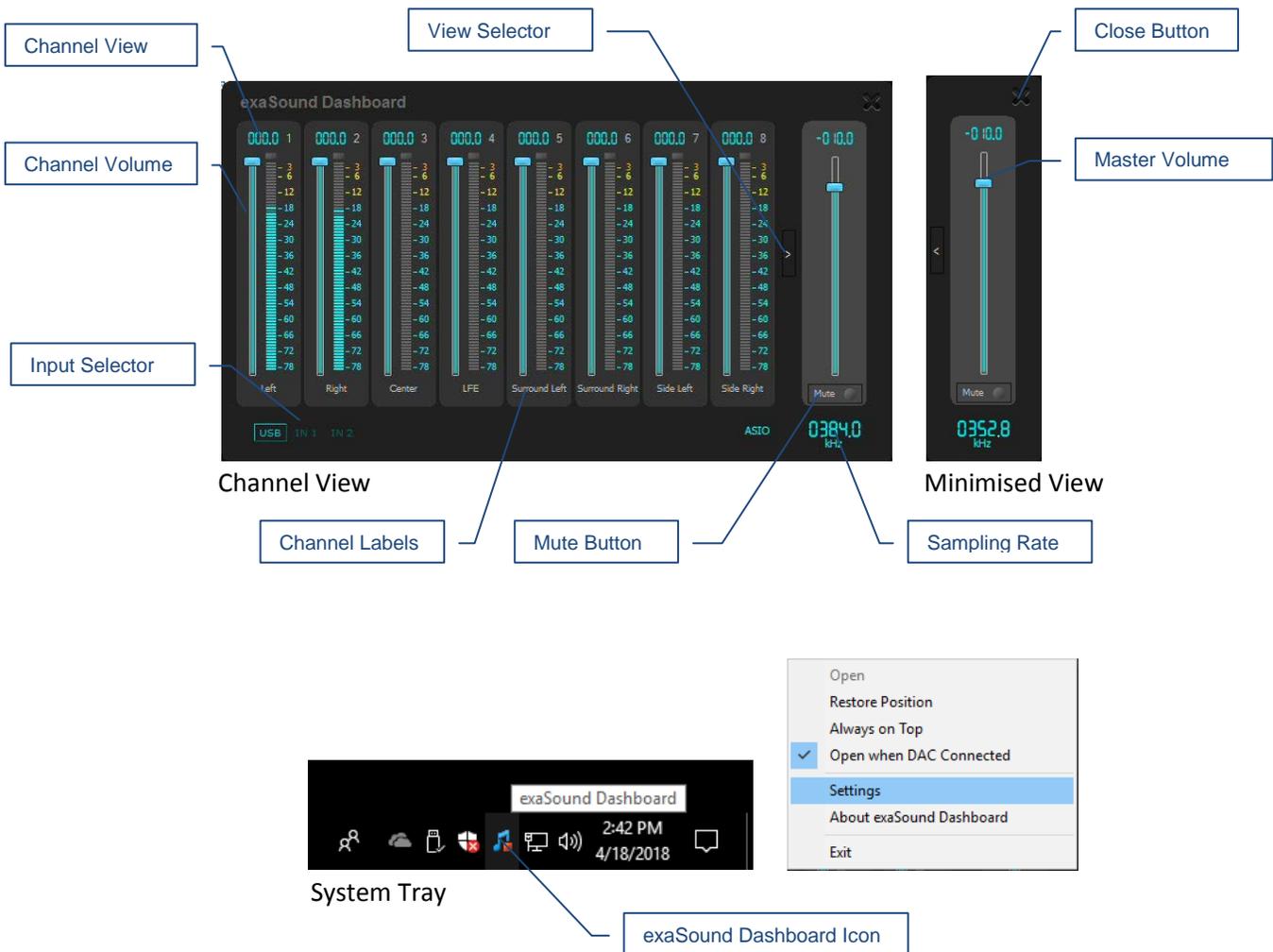
Mac OS Driver Setup

1. Use the username / password that we've emailed you with the shipping confirmation email to login to support.exasound.com.
2. Download and install the latest **exaSound-OS-X-Drivers**. S*tep-by-step setup instructions are available in this guide*.
3. When the installation is complete, your Mac will reboot. You will see the exaSound driver in the Audio MIDI Setup.
4. Select the exaSound driver in the settings window of your player application. Check the *Guides* section of the exaSound blog for step-by-step player configuration instructions: exasound.com/Blog.aspx.
5. The e68 DAC has an automatic power-on function and it will turn itself on when playback is started.

exaSound Menu Icon (Mac OS)

Maximum Volume Limit

Inactivity Auto Power Off

Select Driver Mode

Settings Window

exaSound Icon

Settings

Drive Mode Change Notification

Select Input: USB; SP/DIF: Optical

Audio-MIDI Setup (Mac OS)

Use built-in output for alerts and sound effects

Select the exaSound Core Audio Driver as device for sound output

Channel Volume

Select Output

Select 8-channel Mode

Master Volume
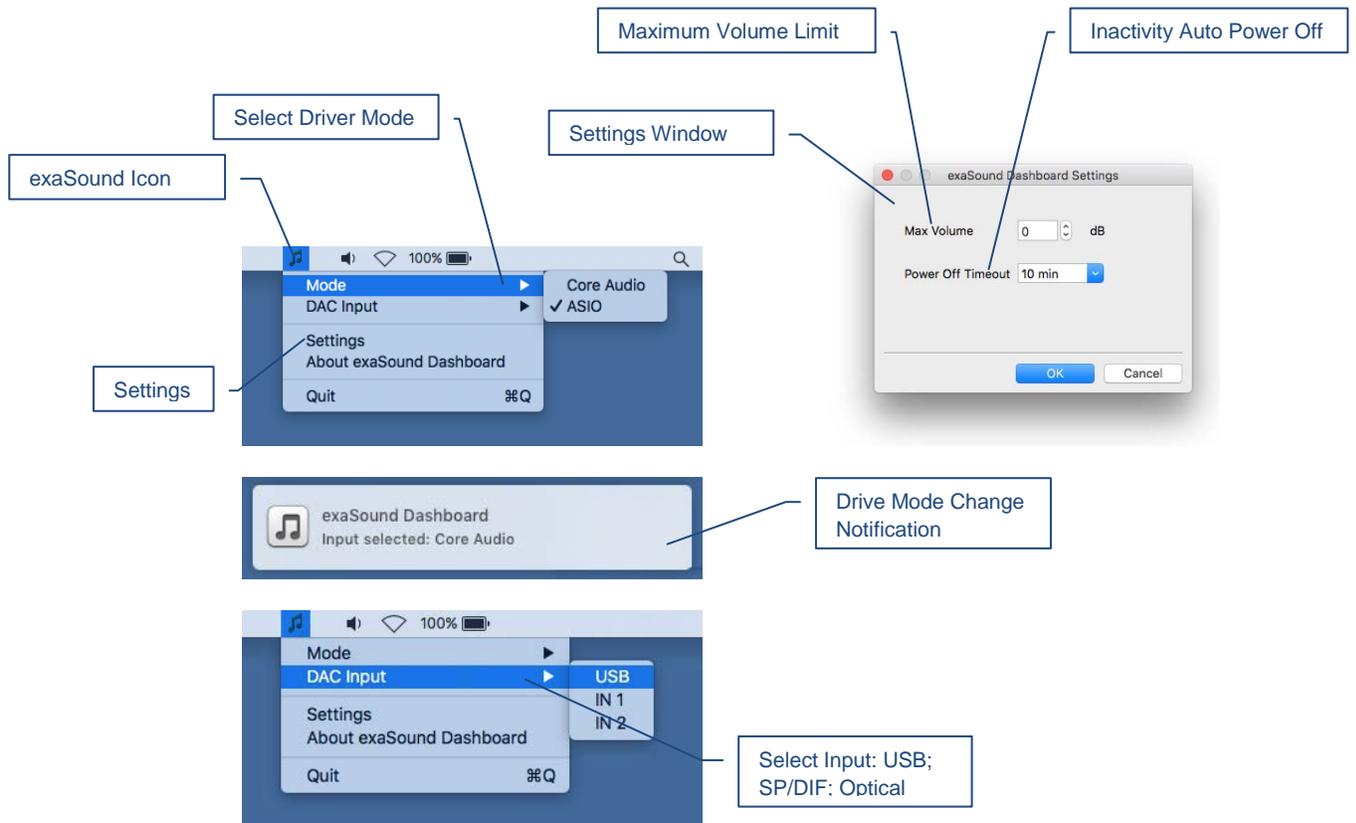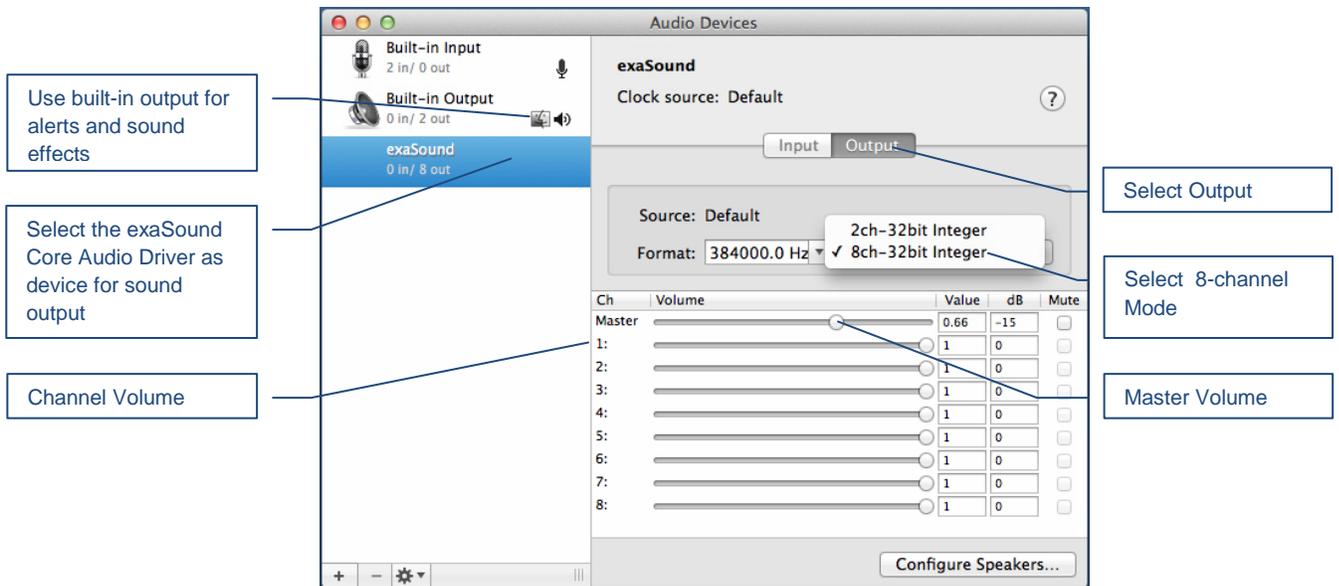
Features

The e68 DAC is based on the ES9038PRO reference DAC chip. It delivers 32-bit precision capable of resolving the smallest signal details. The chip features patented 32-bit HyperStream technology. ES9038PRO delivers the industry's highest performance levels that will satisfy the most demanding audio enthusiasts.

Windows ASIO Driver
Using ASIO brings unique advantages that are hard to achieve with other Windows driver technologies.

Mac OS High-Performance Driver
We offer a custom high-performance Mac OS driver supporting PCM sampling rates from 44.1kHz to 384kHz at 32bit resolution. We support DSD over PCM 1.0 standard at the following sampling rates: DSD64 (2.8224/3.072 MHz), DSD128 (5.6448/6.144 MHz) and DSD256 (11.2896/12.288 MHz).

Proprietary Mac ASIO driver offers DSD512 in Stereo Mode
ASIO brings unique capabilities to the MAC OS platform. exaSound's proprietary ASIO implementation is completely independent from the Core Audio sound system and always operates in Integer / Exclusive Mode. ASIO supports native DSD, while Core Audio drivers rely on the DoP workaround (DSD over PCM). ASIO is more efficient and causes a lower CPU load.
At this time our proprietary ASIO drivers on Mac are supported only by Roon and HQplayer 3.

Bit-perfect operation independent from the Windows volume control and mixer
The Windows volume control and mixer are optimized to provide wide compatibility and easiness of use. These features come at the expense of sonic fidelity. The resulting output may not be bit-perfect or bit-transparent.

Asynchronous USB mode eliminates jitter caused by the PC or the USB interface
Asynchronous USB is a two-way communication method between a computer and an external DAC. e68 controls the rate at which audio data is transmitted over USB. Rather than being sent as a continuous stream, as is the case with standard USB audio interfaces, the data is sent in packets. If a streaming error is detected, the faulty packet is retransmitted. Packet retransmission for error correction is possible because audio data is streamed at speed higher than the playback speed.

The incoming data is stored in a large memory buffer. The data is then clocked out of this buffer by the e68 high-precision master clock. Re-clocking guarantees a very high accuracy and precision of data timing. It completely eliminates jitter caused by computer timing errors and the USB data transport. An added bonus to using packet based streaming over USB is the ability to send and receive control information along with the audio data. This is how volume control instructions are exchanged between the e68 DAC and the computer/streamer.

Hardware Volume Control and Volume Bypass
The e68 DAC volume is controlled by the ES9038PRO DAC chip. It is completely independent from the Windows software volume control. Audio data is always bitstreamed over the USB interface at full scale 0db/32bit resolution. Volume processing is performed by the DAC chip right at the border between the

digital and the analogue domains. This architecture offers signal to noise ratio comparable to the best analogue volume controls. Setting the volume to 0dB turns all volume processing off and sets the e68 DAC in volume bypass mode.

Volume Control Integration with JRiver for Windows / JRemote and Roon
The exaSound Volume Synchronization Plug-ins allow JRiver for Windows, the JRemote app and Roon to access the hardware volume control built in all exaSound DACs.

On Mac OS the volume synchronization is implemented by the exaSound drivers and there is no need for using plug-ins.

Roon Tested

e68 is a Roon Tested DAC. It has been profiled and tested by both Roon Labs and exaSound for maximum compatibility. Roon recognizes exaSound devices and streams audio optimized for their capabilities. Together, Roon and exaSound deliver the power, flexibility, and performance benefits of digital audio, with the easiest setup and highest reliability available.

Connecting and Powering the e68 DAC

⚠	Before connecting, turn off the power to all the components in your system.

Connecting the Digital Inputs

All digital inputs are galvanically isolated to eliminate ground loop noise. The e68 DAC accepts three digital inputs:

- **USB** - This is the recommended and most capable input. It supports PCM up to 32 bit/384 kHz and DSD up to 24.576 MHz/DSD512.
  Connect the e68 DAC to your computer, compatible streamer or audio server using the supplied A-B USB cable. Most standard A-B USB cables with length up to 16 ft (5m) can be used.
- *SPDIF IN1* - SPDIF Input, 75-ohm RCA. Supports 2 channels (Stereo) PCM up to 24 bit resolution at standard sampling frequencies from 44.1 kHz to 192 kHz.
- *SPDIF IN2* - SPDIF Input, TOSLINK, Optical. Supports 2 channels PCM up to 24 bit resolution at standard sampling frequencies from 44.1 kHz to 96 kHz.

Connecting the Line Outputs

- Before making a connection make sure that your analogue power amplifier is powered down.
- *RCA Line Outputs* **1 to 8** - Connect the line outputs of the e38 DAC to the amplifier RCA line inputs.

Trigger Output

When the e68 DAC is on, a 12 VDC signal is sent from the Trigger Output to control other devices. When the e68 is placed in standby mode, the trigger signal is discontinued.

Direct Connection to Analogue Power Amplifier

If your music sources are digital, you don't need a preamplifier. The built-in volume control allows analogue power amplifiers to be connected directly to the e68 DAC. Amplification always brings some level of noise and distortion. Eliminating unnecessary amplification helps to achieve higher level of transparency.

⚠	Avoid connecting the e68 DAC to receivers or any other sound processing equipment that perform analogue to digital (ADC) conversion. Digitizing the analogue output signals back to the digital domain will undo some of the benefits that e68 brings to you. Remember that your sound system is as good as the weakest link in the sound processing chain.

Connecting the Power Supply

To minimize ground noise and hum, it is recommended to connect the power cords of all components to a single point - usually a single surge protector with multiple outlets. Connecting all components to a single point, as close as it is practically possible minimizes the differences in ground potentials between the components.

⚠	**Using a Third-Party Power Supply** The e68 DAC comes with a 12V/1670mA power supply. It has been tested to comply with the DAC's quality requirements and allows for very high performance. If you decide to use another power supply, the specifications marked on the back of the e68 DAC must be observed.

Surge Protectors

We strongly recommend the use of surge protectors for all of your audio and video components.

Isolating the Cable TV Ground

If you have a cable TV connected to your audio system, ensure that the TV cable ground is galvanically isolated from the audio system ground. The TV cable ground, usually connected to the earth outside your home, can have a significantly different potential than the audio ground. This condition can cause audible hum. If you suspect this is the case, use a cable TV ground isolator just before the cable set-top box or at the RF TV input.

| ⚠	When turning on and off your sound system, the power amplifier should be the last component to be turned on and the first component to be turned off. This prevents power on/off transients from being transmitted to the loudspeakers.

# Windows ASIO Drivers Step-by-step Setup Guide

PC System Requirements

- Operating systems:
  - Windows 10
  - Windows 8
  - Windows Server 2012 R2
  - Windows 7, 32 or 64 bit
  - Windows XP / 32 bit with the latest service packs installed
- USB 2.0 / USB 3.0 interface
- 8 GB of RAM

Windows ASIO Driver Installation

1. Don't connect the e68 DAC to the PC until the driver is installed. Don't worry if you've connected the device already. Just disconnect it.

2. Use the username / password that we've emailed you with the shipping confirmation email to login to support.exasound.com.

3. Download the latest driver. Don't use setup packages downloaded from other websites.

4. Unzip the installation package and double-click on *exaSoundN1-5-3-39-Setup.exe.* (The driver version may be higher). Follow the instructions. In most cases you just need to accept the defaults on the following screens.
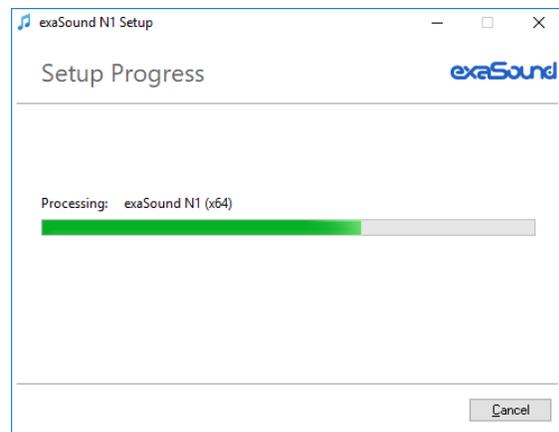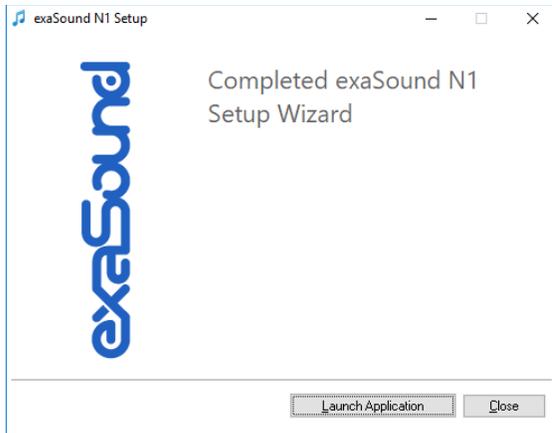
5. Connect the USB cable between the e68 DAC and the computer.

6. Upon completion of the Windows ASIO driver installation you will see the exaSound Dashboard Icon in the System Tray area next to the clock.

exaSound Dashboard Icon
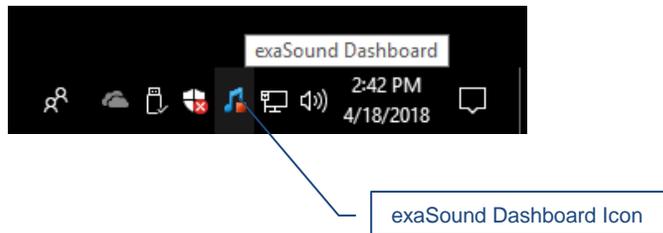
7. If you don't see it, right-click on the clock and select *Taskbar Settings* from the menu.
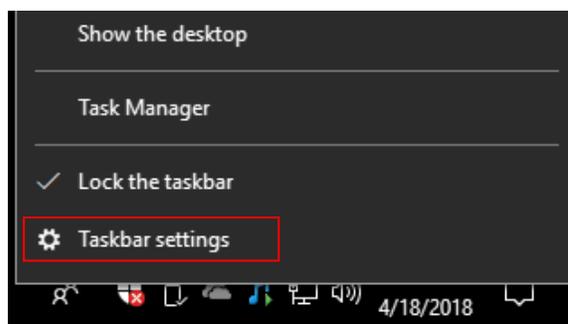
8. On the Taskbar Settings window click on *Select Which Icons Appear on the Taskbar*.
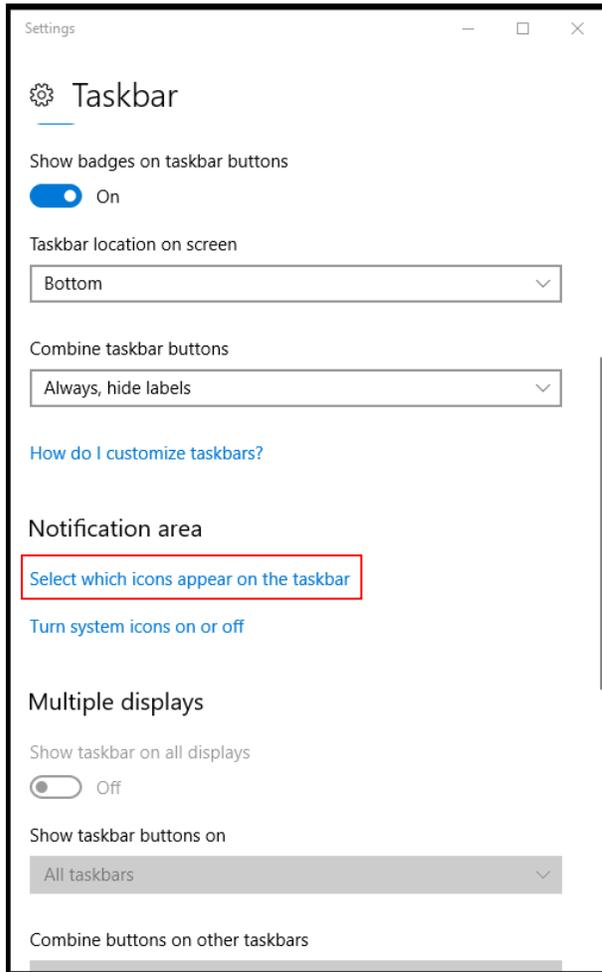
9. Scroll down to the exaSound e68 Dashboard icon and set the toggle to *On*.
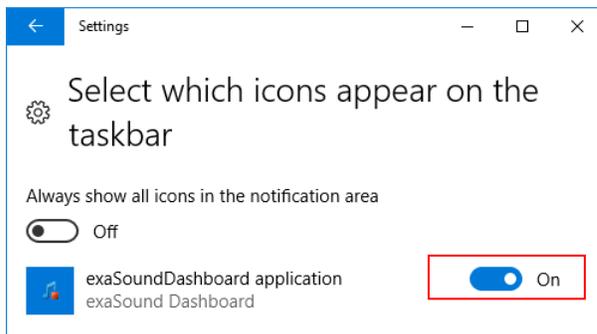
10. You should be able to see the exaSound e68 Dashboard icons at all times. The Icon changes to indicate playback, and displays an exclamation mark when the USB cable is disconnected:

   🎵   exaSound Dashboard
   🎵   *Playback is stopped*
   🎵   *Playback in progress*
   🎵   *The USB cable is disconnected*

11. Close all programs and reboot Windows. Some ASIO players may not recognise the driver if you omit this step. If you don't restart Windows you may get an error message: "Hardware not present".

Using the e68 DAC - Windows

Using the Asynchronous USB Input - Windows

> ⚠️ **Before turning your amplifiers ON, always check the e68 DAC front panel to make sure that the volume level is safe.**

- The e68 DAC can be controlled from the front panel buttons, using an IR remote control or from the computer screen.
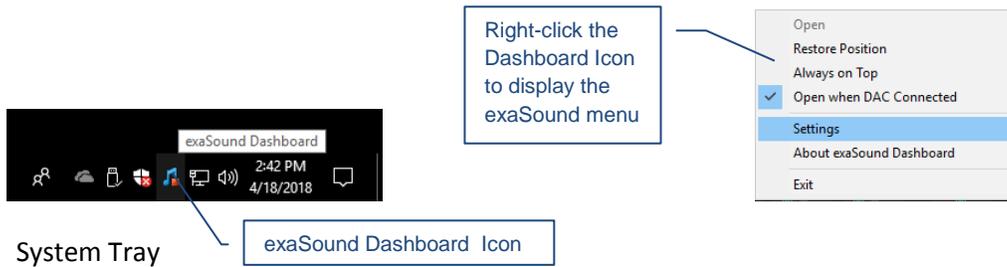- Make sure that all cables are connected. Turn on the unit using the **Power** button on the front panel or the remote control. The front panel display will light up.
- Click on the exaSound e68 Dashboard Icon in the System Tray area next to the clock.

Right-click the Dashboard Icon to display the exaSound menu

Open
Restore Position
Always on Top
✓ Open when DAC Connected
Settings
About exaSound Dashboard
Exit

exaSound Dashboard

System Tray

exaSound Dashboard Icon

- You will see the exaSound e68 Dashboard window.

View Selector

Close Button

Channel View

Channel Volume

Master Volume

exaSound Dashboard

Channel View

Minimised View

Input Selector

Channel Labels

Mute Button
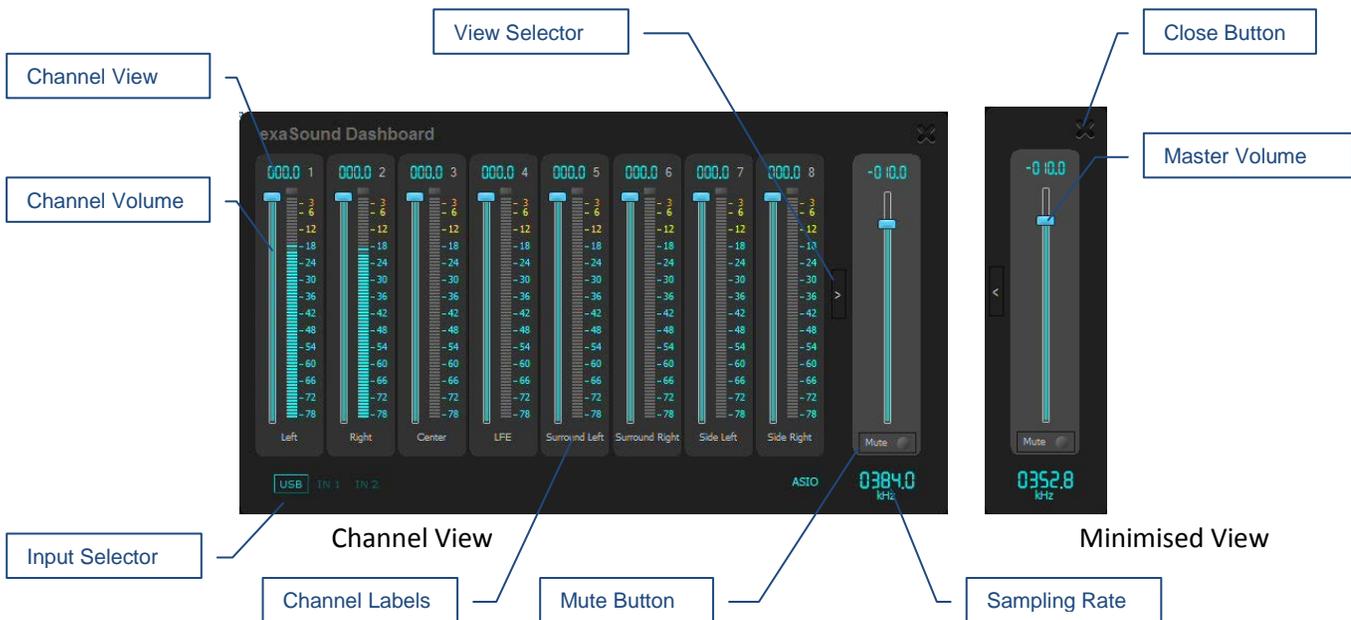
Sampling Rate

- During playback the current sampling rate and stream format are displayed under the master volume slider.

- You can customize the channel labels: Select a label with the mouse and edit the channel title. Press **Enter** to save or **Cancel** to undo the change.
- Use the arrow button between the right channel and the master volume to toggle between **Channel View** and **Minimised View**.
- Use the **X** button in the top right corner to minimize the exaSound Dashboard window.

JRiver / JRemote Volume Synchronization Plug-in - Windows

The exaSound Volume Synchronization Plug-in allows JRiver for Windows and JRemote to access the hardware volume control built in all exaSound DACs.

- Moving the JRemote or JRiver volume slider changes the master volume slider on the exaSound Dashboard.
- Changing the master volume with the exaSound Dashboard adjusts the JRemote / JRiver volume sliders.

Installation Instructions:
1. Run the exaSound plug-in Setup.
2. Restart JRiver.
3. You will see the exaSound plug-in listed in JRiver under Services & Plug-ins. Select exaSound and use the checkbox to enable or disable volume synchronization.
4. For best results set JRiver to System Volume or Application Volume mode.
5. Click on the Volume Options icon on the left side of the volume slider and select Enable Volume When Bitstreaming.

Check the *Guides* section of the exaSound Blog for step-by-step configuration instructions for the exaSound Volume Synchronization Plug-in: exasound.com/Blog.aspx

Roon Volume Synchronization Plug-in - Windows

The Roon Volume Synchronization Plug-in allows Roon for Windows to access the hardware volume control built in all exaSound DACs.

- Moving the Roon volume slider changes the master volume slider on the exaSound Dashboard.
- Changing the master volume with the exaSound Dashboard adjusts the Roon volume slider.

Installation Instructions:

1. Download and unzip exaSound-Roon-Volume-Plugin-Setup.zip.
2. Double-click exaSoundRoonVolumePlugin Setup 1.0.1.msi to start the setup and follow the instructions.
3. You will see the icon of the exaSound Volume Plug-in for Roon on the system tray (next to the clock).
4. Start Roon and from the menu go to Settings. Click on the Extensions tab.

5. You should see the exaSound Volume Plug-in in the list of discovered extensions.
6. Click on the Audio tab in the Roon Settings window.
7. From the list of local audio zones find a zone configured for use with an exaSound ASIO driver.
8. Click or tap the settings icon for the zone and select Device Setup.
9. Open the Volume Control drop-down and select exaSound Volume: ASIO.
10. Tap or click on the Save button at the bottom of the Settings window.
11. From the list of local zones select an audio zone configured for use with exaSound ASIO driver.
12. Try changing the Roon volume. You should see the volume level changes on the display of your exaSound DAC.

Step-By-Step Player
Check the *Guides* section of the exaSound Blog for step-by-step configuration instructions for the Roon Volume Synchronization Plug-in: exasound.com/Blog.aspx

Settings Menu - Windows

- Right-click on the exaSound icon on the system tray next to the clock. From the pop-up menu select Settings. You can also display the menu by right-clicking on the background area of the Dashboard.
- Use the *Max Volume* setting to prevent accidental playback at volume levels that are too loud.
- The e68 DAC automatically turns itself off after a period of inactivity. Use the *Power Off Timeout* setting to adjust the time interval before shutdown.
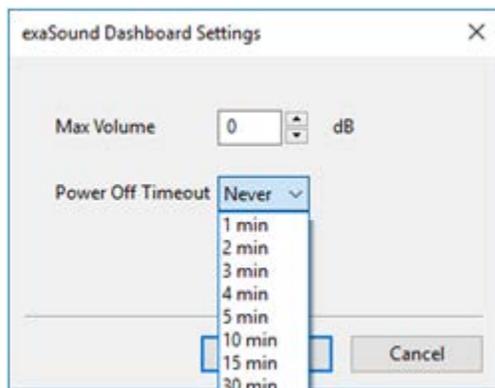
Step-By-Step Player Configuration Instructions - Windows

ASIO-enabled player apps compatible with the e68 DAC include Roon, HQPlayer and JRiver Media Center. Step by step configuration instructions are available in the Guides section of our blog: exasound.com/Blog.aspx

Using Player Apps without ASIO Support

Player apps without ASIO support require the use of third-party WASAPI to ASIO bridge applications like VB-Audio ASIO Bridge available as a free download from [vb-audio.com/Cable/.](vb-audio.com/Cable/)

JRiver Media Center offers with built-in WASAPI to ASIO bridge functionality.

Mac OS Drivers Step-by-step Setup Guide

System Requirements

Operating System	Mac OS Mavericks, Yosemite, El Captain, Sierra, High Sierra, Mojave
Recommended CPU for operating at 352.8 and 384 kHz	2.4GHz Intel i5 or better

Software Installation

1. Don't connect the e68 DAC to your Mac until the driver is installed. Don't worry if you've connected the device already. Just disconnect it.

1. Use the username / password that we've emailed you with the shipping confirmation email to login to support.exasound.com.

2. Download the latest version of the exaSound Drivers Installer for Mac OS. Don't use setup packages downloaded from other websites.
   - Locate the installation package **exaSound-OS-X-Drivers-5-3-40.zip** in your *Downloads* folder. (The version number at the end of the file name may be higher.)
   - Double-click it. A Finder window will pop-up and you will see **exaSound-OS-X-Drivers-5-3-40.pkg** highlighted.
   - Double-click **exaSound-OS-X-Drivers-5-3-40.pkg** and follow the prompts. You just need to accept the defaults on the following screens. At the end of the installation your Mac will reboot.
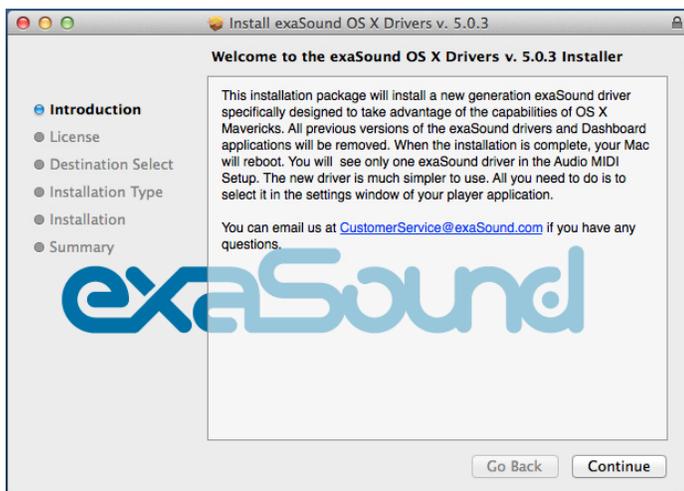
2. Locate the exaSound Dashboard icon on the menu bar. The red exclamation mark indicates that the USB cable is disconnected:

3. Connect the USB cable of the exaSound DAC. The red exclamation mark should disappear from the exaSound Dashboard icon.

4. Power on the DAC. The red square overlay on the exaSound Dashboard icon indicates that the device is *On* and playback is stopped.
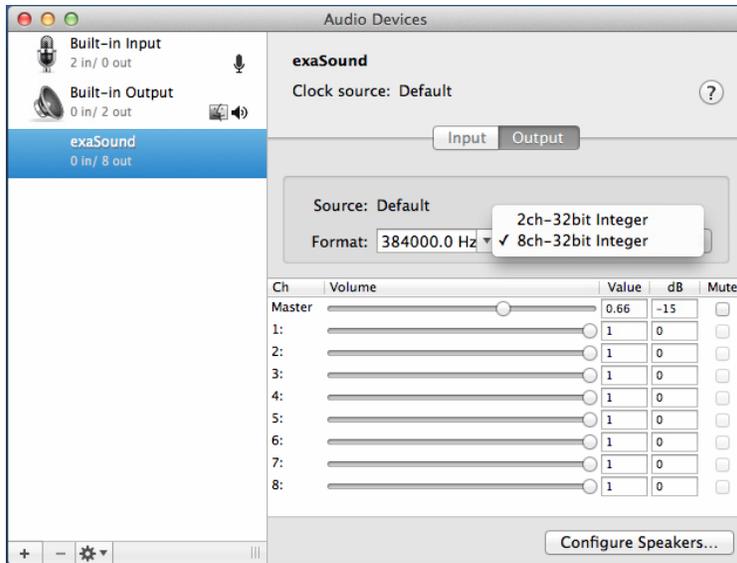

5. During playback the red square changed to a green triangle.

6. Click on the exaSound Dashboard icon and make sure that Core Audio is checked.
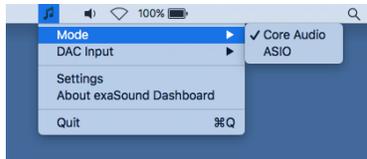
7. Go to *Applications -> Utilities* and open *Audio MIDI Setup*. Select the exaSound driver. By default the driver is set to 2-channel (Stereo) mode. Select 8ch-32-bit Integer.

8. Make the exaSound driver the default sound output device.
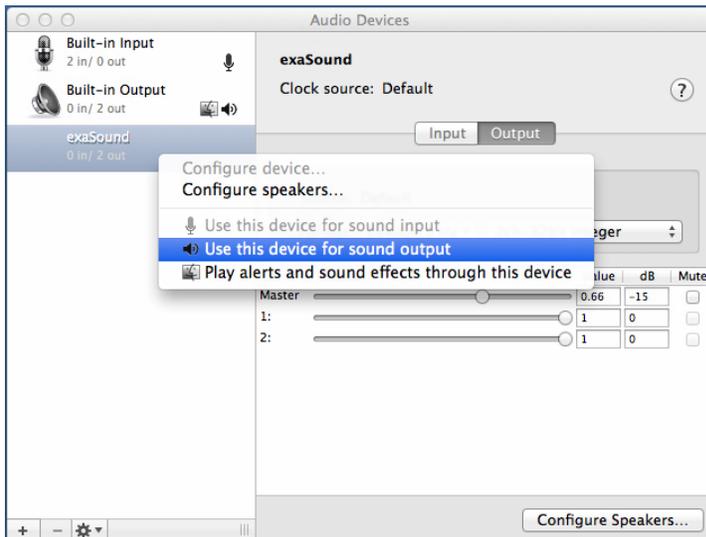
9. Make sure that the volume is set to less than -25db. At this point you are ready to play music.

Step-By-Step Player Configuration Instructions - Mac OS

Popular Core Audio player apps include Roon, Audirvana, HQplayer and JRiver. Step by step configuration instructions are available in the Guides section of our blog: exasound.com/Blog.aspx

ASIO-enabled player apps compatible with the e68 DAC include Roon and HQPlayer 3.

Using the e68 DAC - Mac OS

Using the Asynchronous USB Input - Mac OS

<table>
<tr>
<td>⚠</td>
<td>Before turning your amplifiers ON, always check the e68 DAC front panel to make sure that the volume level is below -25dB.

Please follow the safety measures below strictly. It is quite common to set the volume on your Mac to maximum. You should never do this when your e68 DAC is connected to a powerful amplifier. Playing music or sound effects at maximum level is dangerous for your health and may damage your audio equipment.

Please note that the e68 DAC will match the volume level of your Mac when it is turned on. This may cause unexpected volume level rising.</td>
</tr>
</table>

- The e68 DAC can be controlled from the front panel buttons, using an IR remote control or from the Mac screen.
- Make sure that your power amplifier is turned off.
- Make sure that all cables are connected.
- Turn on the unit using the **Power** button on the front panel or the remote control. The front panel display will light up. After powering on the last used input is selected by default. Select the **USB Input.**
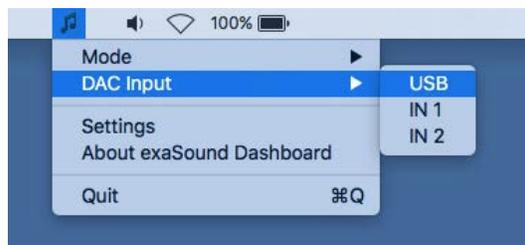
- Lower the volume to at least -25 db. The volume on the e68 DAC can be controlled from the Mac screen, from the device front panel, or with the infrared remote control.
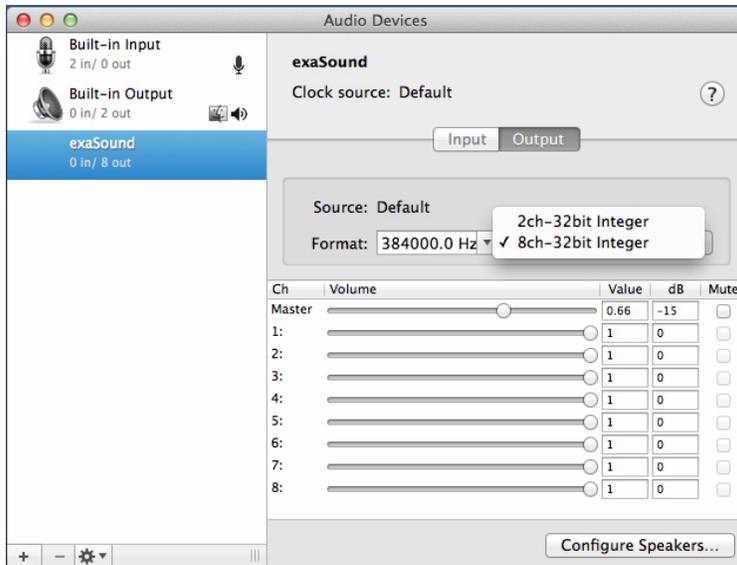
Audio-MIDI Setup App

- Make sure that the desired volume level is displayed on the DAC front panel.
- Turn on your power amplifier.

Settings Menu - Mac OS

- Click on the exaSound icon on the Menu and select Settings.
- Use the *Max Volume* setting to prevent accidental playback at volume levels that are too loud.
- The e68 DAC automatically turns itself off after a period of inactivity. Use the *Power Off Timeout* setting to adjust the time interval before shutdown.
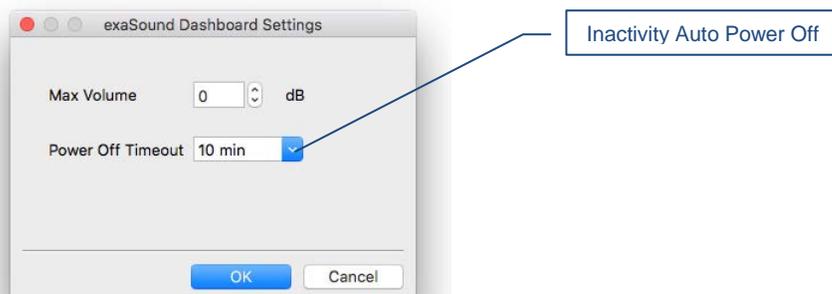
Using the exaSound ASIO Drivers for Mac OS

Make sure that the player app is configured for ASIO output. Click on the exaSound Dashboard icon. By default the *Input* is set to *Core Audio*. Select *ASIO*.

Note: When ASIO mode is selected, you won't be able to use the exaSound Core Audio driver.

At the present time ASIO on Mac OS is supported only by Roon and HQPlayer 3.

Step-By-Step Player Configuration Instructions

Check the *Guides* section of the exaSound blog for player step-by-step configuration instructions: exasound.com/Blog.aspx.

Volume Control

The e68 DAC volume is controlled by the ES9038PRO DAC chip. It is completely independent from the Windows and Mac software volume controls and it preserves the maximum possible signal to noise ratio.

The volume level changes in steps of 0.5 dB. At first power on, the volume level is set to -40dB. When the dashboard is closed it remembers the last used volume level.

On the Windows platform use the sliders on the exaSound Dashboard to control the volume for individual channels and the master volume. The sliders can be controlled in several ways:
- By left-clicking and dragging a slider.
- By positioning the mouse cursor over a channel and turning the mouse wheel. When the mouse cursor is rested over the channel area the background color changes to indicate that the channel is active.
- By selecting a channel with the mouse and using the **Up** and **Down** arrow keys on the keyboard.

On Mac use the volume slider on the Menu, the Audio-midi Setup App or the volume slider of the player app.

The master volume can also be controlled from the e68 front panel or by using a remote control. When the master volume level is changed, the value displayed on the exaSound Dashboard, the Audio-MIDI Setup app and on the device display are synchronised.

Volume levels for individual channels can be controlled from the exaSound Dashboard on Windows and the Audio-MIDI Setup app on Mac.

The sound can be muted by clicking the **Mute** button under the master volume slider or by using the remote control. Pressing or clicking **Mute** again restores the previous volume level. Pressing **Volume Up** or **Volume Down** will cancel the mute state.

Note: Level indicators on the Windows Dashboard are inactive in DSD mode.

Volume Bypass

When the volume sliders on the exaSound Dashboard or the Audio-MIDI Setup app are set to 0dB, the hardware volume control is turned off and the e68 DAC operates in Volume Bypass Mode.

To activate Volume Bypass:

- Set the master volume slider to 0dB.

- Set the left and right volume sliders to 0dB.

- Make sure that your player is not changing the volume level.

Playing Music from SPDIF Sources

The e68 DAC makes it possible to enjoy greatly improved level of sonic clarity and fidelity from stereo SPDIF sources. The sonic improvement is the result of the outstanding jitter cancelling capability, superb signal to noise ratio, and low distortion levels of the e68 DAC.

You can connect up to two SPDIF devices, such as disk players and wireless music servers.

To use SPDIF sources:
1. Select SPDIF input by pressing the *Input* button on the device front panel, by using the *Previous Input* / *Next Input* buttons on the remote control or with the *Input Selector* on the exaSound Dashboard.
2. The e68 front panel display will flash a *Changing Input* message.

3. The e68 front panel will display information about the input in use, the current sampling rate, and the master volume level.
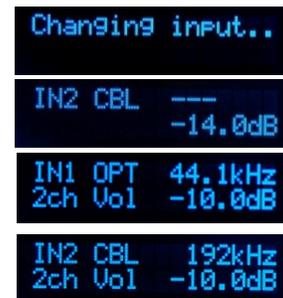
Automatic Power On/Off

- The e68 DAC has an automatic power-on function and it will turn itself on when playback is initiated.
- The e68 DAC can be configured to automatically turn itself off after a period of inactivity. Use the Power Off Timeout setting to adjust the inactivity time interval before shutdown.
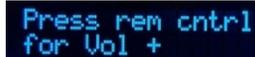
IR Remote Control Setup

The e68 DAC is configured to work with the supplied remote control. If you like, you can reprogram the se68 DAC to work with a different IR remote control. The exaSound e68 DAC can learn to recognise commands from most infrared remote controls using Sony and NEC IR protocols.

Use the following procedure to change remote control button assignments or to pair the e68 DAC with a different remote control:

1. Power on the e68 DAC. Make sure that the unit is not in playback mode.

2. Press the **Setup** button.

3. Press the **Volume Up** button to confirm the remote control learning mode, or press the **Volume Down** button to cancel the operation.

    `vol+ -> Set rem`
    `vol- -> Cancel`

4. Point the remote control to the e68 DAC display. Press and hold down the remote control buttons for about one second during each step below to assign functions to them.

5. Press the remote control button for increasing the volume.

    `Press rem cntrl`
    `for Vol +`

6. Press the remote control button for decreasing the volume.

    `Press rem cntrl`
    `for Vol -`

7. Press the remote control button for selecting the next input.

    `Press rem cntrl`
    `for next input`

8. Press the remote control button for previous input.

    `Press rem cntrl`
    `for prev input`

9. Press the remote control button for turning the unit on and off.

    `Press rem cntrl`
    `for power`

10. Press the remote control button for mute.

    `Press rem cntrl`
    `for mute`

11. Press the remote control button for turning the display light on and off.

12. Wait until the remote control configuration is saved. Your e68 DAC is now paired for use with the new IR remote control.
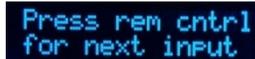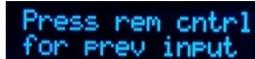
    `Saving`

Specifications

D/A Converter IC	ESS Technology ES9038PRO 32-bit, 8-channel PRO series
PCM Sampling Rates - USB	44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz, 352.8kHz, 384kHz
DSD Sampling Rates - USB: • Windows ASIO • Mac ASIO • Mac Core Audio • exaSound streamers and servers Notes: • ASIO Compatible player like Roon, JRiver and HQplayer is requited on Windows. • ASIO on Mac OS is supported by Roon and HQPlayer 3	DSD64: 2.8224MHz; 3.072MHz DSD128: 5.6448MHz; 6.144MHz DSD256: 11.2896MHz; 12.288MHz
DSD512 - USB - Stereo Mode: • Windows ASIO • Mac ASIO • exaSound streamers and servers Note: • DSD512 is not supported on Mac Core Audio	DSD512: 22.5792MHz; 24.576MHz
PCM Sampling Rates-SPDIF Coaxial IN 1	PCM 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
PCM Sampling Rates- Optical (TOSLINK) IN 2	PCM 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz
Total Harmonic Distortion + Noise,1kHz, 0dBFS	0.0004%
Total Harmonic Distortion1kHz, 0dBFS, typical	0.0002%

Intermodulation Distortion 19kHz + 20kHz 0 dBFS 2nd order IMD, typical	-122 db / 0.00008%
Signal-to-Noise Ratio A-weighted, 2.1 Vrms, typical	123 dB
DAC Master Clock Jitter	0.082 psec (82fsec) rms
Frequency Response	0Hz - 20kHz (-0.15dB) @ 44.1kHz / 48kHz sampling rates; 0Hz - 30kHz (-0.15dB) @ sampling rates >= 88.2kHz;
Phase	Non-inverting
Channel Separation , typical	133 dB @ 1KHz for adjacent channels 123 dB @ 1KHz between channel groups
Digital Inputs	USB 2.0, SPDIF Coaxial, SPDIF TOSLINK (optical)
Number of channels, USB	2 to 8 channels PCM, DSD
Number of channels, SPDIF	2 channels PCM
Operating System Requirements - Windows	Windows 10 x64, Windows 8 x86/x64, Windows Server 2012 R2, Windows 7 x86/x64, Windows XP x86 ASIO compatible player required for all Windows platforms
Operating System Requirements - Mac	Mac OS Mavericks, Yosemite, El Captain, Sierra, High Sierra, Mojave
Digital Volume Control Steps	0.5 dB
Volume Matching between Channels	Better than 0.1 dB
Line Outputs, Unbalanced	RCA, gold-plated contacts
Line Output Level	2.1 Vrms
Line Output Impedance	200 ohms
Line Output Offset	< 5 mV
Headphone Amp Current Output	250 mA peak

Headphone Amp Output Impedance	1 Ohm, 20Hz-20KHz
Headphone Amp Output Voltage	0-6V
Headphone Amp THD+N , typical	0.00052%, 1Vrms into 60ohms
Headphone Amp Intermodulation Distortion 1Vrms into 60ohms 19kHz + 20kHz 2nd order IMD	-117dB 0.00014%
Headphone Jack	1/4" TRS SE
USB Connector	USB B
Power Jack Diameter	Internal: 2.5mm External : 5.5mm
Power Consumption	<20 W
Dimensions (W x H x D)	6.5 x 2.2 x 9.25 inches (165 x 55 x 235 mm)
Weight	2.4 lbs (1.1Kg)

Safety Information

Explanation of Graphical Symbols

⚡	The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.
⚠	The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the Device.

Important Safety Instructions

1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean only with dry cloth.
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong is provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched, particularly at plug, receptacle, and the point where it exits from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Refer all servicing to qualified service personnel. Servicing is required when the device has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the device, the device has been exposed to rain or moisture, does not operate normally, or has been dropped.

Precautions

- Before connecting the AC power adapter cord to the device, make sure the voltage designation of the power adapter corresponds to the local electrical supply. If you are unsure of your power

supply, contact your local power company. The acceptable power input range is AC ~ 100V-240V, 50/60Hz

- The device is still receiving power from the AC power source as long as it is connected to the wall outlet, even if the device itself has been turned off.
- Unplug the power adapter if you are not going to use the device for an extended period of time. Hold the power adapter when unplugging. Do not pull on the cord.
- The power adapter is used as the mechanism for cutting off power, therefore make sure it is easy to unplug.
- To ensure proper ventilation around this product, do not place this product on a sofa, bed or rug.
- High temperature will lead to abnormal operation of this device. Do not expose this device or batteries to direct sunlight or near heating objects.
- When moving the device from a cold location to a warm one, or vice versa, moisture may condense on components inside the device. Should this occur, the device may not operate properly. In such a case please turn the device off for 1-2 hours to facilitate moisture evaporation.

⚠	**WARNING:** TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS DEVICE TO RAIN OR MOISTURE. DANGEROUS HIGH VOLTAGES MAY BE PRESENT INSIDE THE ENCLOSURE. DO NOT OPEN THE CABINET. REFER SERVICING TO QUALIFIED PERSONNEL ONLY. THE DEVICE SHALL NOT BE EXPOSED TO DRIPPING OR SPLASHING AND THAT NO OBJECTS FILLED WITH LIQUIDS, SUCH AS VASES SHALL BE PLACED ON THE APPARATUS.
⚠	**WARNING:** CHANGES OR MODIFICATIONS NOT AUTHORIZED BY THE MANUFACTURER CAN INVALIDATE THE COMPLIANCE TO REGULATIONS AND CAUSE THE UNIT TO BE NO MORE SUITABLE TO USE. THE MANUFACTURER REFUSES EVERY RESPONSIBILITY REGARDING DAMAGES TO PEOPLE OR THINGS DUE TO THE USE OF A UNIT WHICH HAS BEEN SUBJECT TO UNAUTHORIZED MODIFICATIONS OR TO MISUSE OR TO MALFUNCTION OF A UNIT WHICH HAS BEEN SUBJECT TO UNAUTHORIZED MODIFICATIONS.
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: • Reorient or relocate the receiving antenna. • Increase the separation between the equipment and receiver. • Consult the dealer or an experienced radio/TV technician for help. Any unauthorized changes or modifications to this equipment would void the user's authority to operate this device. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

CE	This unit is compliant with Directive 2011/65/EC (RoHS) Restriction on Hazardous Substances, and is in conformity with the provisions of the EMC Directive 2004/108/EC. The following harmonized standards were applied: EN55022:2010/AC:2011 Class B EN61000-3-2:2006/A1:2009 and /A2:2009, EN61000-3-3:2008 EN55024:2010 (IEC 61000-4-2:2008, IEC 61000-4-3-2006/A1:2007/A2:2010, IEC 61000-4-4:2004/A1:2010 , IEC 61000-4-5:2006, IEC 61000-4-6:2008, IEC 61000-4-8:2009, IEC 61000-4-11:2004) 1999/5/ec - Radio and telecommunication Terminal Equipment Device (R&TTE) EN 60950-1, EN62311 - For Article 3.1(a): Health and safety of the user EN 301 489-1, EN 301 489-17 - For Article 3.1(b): Electromagnetic Compatibility EN 300 328, - EN 301 893 - For Article 3.2: Effective use of spectrum allocated
	This product, when no longer usable, when disposed off can't be treated as generic garbage, but must be disposed of at a collection point for recycling of electrical and electronic equipment, in compliance with the WEEE regulation (Waste of Electrical and Electronic Equipment). By making sure that this unit is correctly recycled, you will help preventing potential damages to environment and human health, which could be caused by the incorrect treatment of this product as generic garbage. Materials recycling helps conserve natural resources.
⚠	We use our best efforts to ensure that information in this document is complete, accurate and current, but otherwise we make no representation concerning the same. We reserve the right to change or modify the information any time, without prior advice. It's up to the customer to ensure that the manual being consulted is the latest version.
Trade marks	▪ ZeroJitter™, GalvanicInfinity™, ENclusiv™, FemtoMaster™ and ZeroResolutionLoss™ are trademarks of exaSound Audio Design. ▪ Direct Stream Digital (DSD) is a trademark of Sony Corporation. ▪ Roon and Roon Ready and the Roon Labs logo are trademarks or registered trademarks of Roon Labs or Roon Labs's licensors. ▪ Designed for Windows Media, Microsoft, HDCD, and the HDCD logo are trademarks or registered trademarks of Microsoft Corporation in the United States and/or other countries. ▪ Apple, Mac, AirPlay, iOS and OS X are trademarks of Apple, Inc. ▪ All other trademarks are the properties of their respective owners.

Limited One Year Warranty

exaSound's devices are warranted against defective workmanship or materials for one (1) calendar year from the original date of purchase. This warranty applies only to exaSound brand products manufactured by exaSound and sold to the original consumer by either exaSound or an exaSound authorized reseller. This warranty does not apply to exaSound brand products imported and sold by unauthorized dealers, distributors, or other sellers. exaSound may at its sole discretion, refuse to honour the warranty of any such unauthorized product that may be presented for service.

Warranty service can only be performed by exaSound. Devices which are defective must be shipped pre-paid and insured to exaSound for warranty service in accordance with our Return Policy published at http://www.exasound.com/Store/TermsofUse.aspx. For products that we verify to be eligible for warranty service, we will pay the shipping cost to return the Device to you via ground shipment.

If in our assessment the defect is covered by our Warranty, the defective item will, at our sole option, be repaired, replaced with the same item or its functional equivalent, or the purchase price will be refunded. exaSound in its sole and absolute discretion shall be the sole determiner of whether a product is in fact defective.

Replacement parts and products assume the remaining original warranty, or ninety (90) days, whichever is longer.

This limited warranty covers non-commercial use of this product, and shall not apply to the following, including, but not limited to: applications and uses for which this product was not intended; altered product or serial numbers; cosmetic damage or exterior finish; batteries and cable accessories; accidents, abuse, neglect, fire, water, lightning or other acts of nature; incorrect electrical line voltage, fluctuations and surges; failure to follow operating or maintenance instructions. exaSound does not warrant uninterrupted or error-free operation of the product. This limited warranty shall not extend to anyone other than the original purchaser of the product. It is non-transferable and states your exclusive remedy.

exaSound hereby expressly disclaims all liability for product defect or failure, that are due to normal wear, product misuse, physical tampering, abuse, product modification, improper product selection, non-compliance with any codes, misappropriation or the failure of the Device while being used for purposes for which it was not intended.

THE FOREGOING WARRANTY IS THE ONLY WARRANTY WITH RESPECT TO THE DEVICES AND WE MAKE NO OTHER WARRANTY WHATSOEVER, EXPRESS OR IMPLIED, REGARDING THE DEVICES INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. IN NO EVENT WILL EXASOUND, OR ITS AUTHORIZED RESELLERS BE LIABLE FOR INCIDENTAL, CONSEQUENTIAL OR SPECIAL DAMAGES, EVEN IF SUCH DAMAGES RESULT FROM NEGLIGENCE OR OTHER FAULT.

TO OBTAIN WARRANTY SERVICE, please follow these instructions:

- Contact exaSound customer service via email at CustomerService@exaSound.com with details of the defect claimed, product model, serial number, date and place of the original purchase.
- If it is determined that your product needs service, a Return Merchandise Authorization (RMA) number will be issued to you along with return instructions and address of an exaSound service center.
- Pack the product securely in the original packaging, with your assigned RMA number marked clearly on the outside of the package. Send the package pre-paid and insured to the exaSound to obtain warranty service.
- All returns must comply with our Return Policy displayed at http://www.exasound.com/Store/TermsofUse.aspx.