



e32 Digital to Analogue Converter

DSD 256 Fs / 12.288 MHz

DXD 32bit / 352.8 kHz

PCM 32 bit / 384 kHz

Owner's Manual (Mac OS)

PLEASE READ BEFORE OPERATION



REV. 1.0.0b – 11/2016

Table of Contents



Safety Information	4
Explanation of Graphical Symbols	4
Important Safety Instructions	4
Precautions	4
Welcome.....	7
Quick Start.....	8
Package Contents.....	8
Proper Device Placement.....	8
Front Panel Controls	8
Rear Panel Connectors.....	9
Infrared Remote Control.....	9
Driver Setup	10
exaSound Menu Icon	10
Audio-MIDI Setup.....	11
Features.....	12
Mac OS High-Performance Driver.....	12
Proprietary Mac ASIO Drivers	12
Automatic PCM / DSD Switching.....	12
Asynchronous USB mode.....	12
Hardware Volume Control and Volume Bypass.....	12
Connecting and Powering the e32 DAC.....	13
Connecting the Digital Inputs	13
Connecting the Line Outputs	13
Trigger Output.....	13
Direct Connection to Analogue Power Amplifier.....	13
Analogue Interconnect Recommendations	14
Connecting the Power Adapter.....	14
Surge Protectors	14

Isolating the Cable TV Ground	15
Remote Control Setup.....	16
Setup of exaSound e32 Driver and Dashboard for Mac OS	17
System Requirements	17
Software Installation.....	17
Using the e32 DAC	20
Using the Asynchronous USB Input	20
Power On/Off.....	21
Volume Control.....	22
Volume Bypass.....	22
Settings Menu	23
Using the exaSound ASIO Drivers for Mac OS	23
Step-By-Step Player Configuration Instructions	23
Playing Music from SPDIF Sources.....	24
Specifications.....	25
Limited One Year Warranty.....	27

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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 other 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.

	<p>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.</p>
	<p>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.</p>
<p>FCC Statement</p>	<p>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:</p> <ul style="list-style-type: none"> • 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. <p>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.</p>
	<p>This unit is compliant with the following CE regulations when an USB cable less than 3m is used: CEI EN 55022:2009 Class B (Radiated Emissions), CEI EN 55024:1999, CEI EN 55024:A2/2003, CEI EN 55024:IS1/2008 (Radio Frequency Electromagnetic Fields, 50Hz Magnetic Field Immunity Test and Electrostatic Discharges – ESD).</p>

	<p>This product, when no longer usable, can't be treated as generic garbage. It 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).</p> <p>By making sure that this unit is correctly recycled, you will help preventing potential damage to environment and human health, which could be caused by the incorrect treatment of this product as generic garbage. Materials recycling helps conserving natural resources.</p>
	<p>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.</p>
	<p>ASIO is a registered trademark of Steinberg Media Technologies GmbH</p>
<p>Trade marks</p>	<ul style="list-style-type: none"> ▪ Direct Stream Digital (DSD) is a trademark of Sony Corporation. ▪ 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, Mac OS and OS X are trademarks or registered trademarks of Apple Inc. ▪ All other trademarks are the properties of their respective owners.

Welcome

Thank you for purchasing the exaSound e32 DAC!

The e32, a fourth generation DSD 256 DAC offers the highest native digital audio resolution available on the market today. e32 has vanishingly low jitter, distortion and noise levels, and astonishingly clean analog-like sound.

We hope that the e32 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

Package Contents

The following items should be in the box:

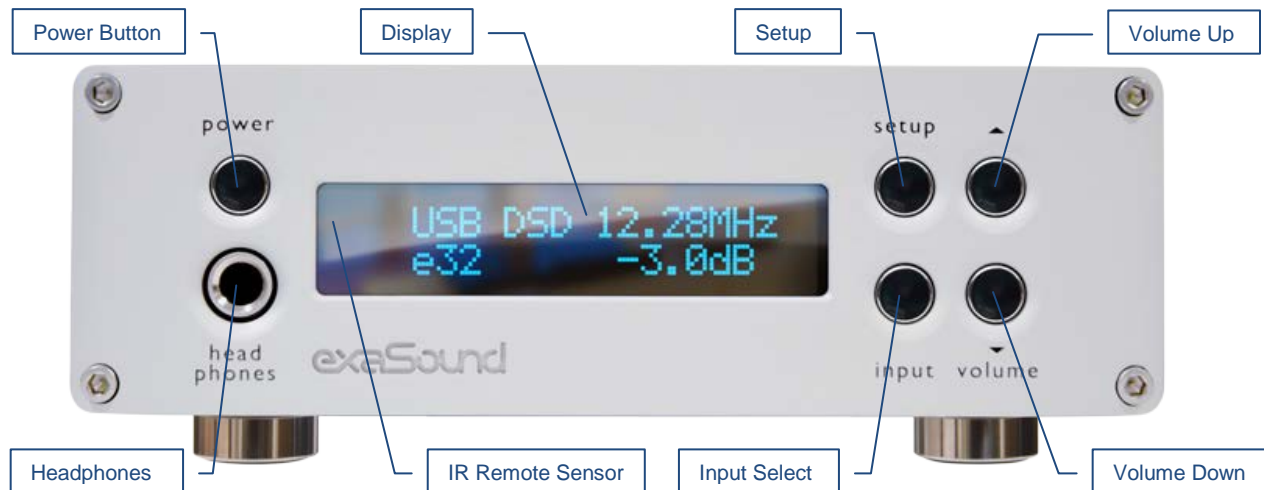
- e32 DAC
- Power supply
- A-B USB cable
- IR Remote Control

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.

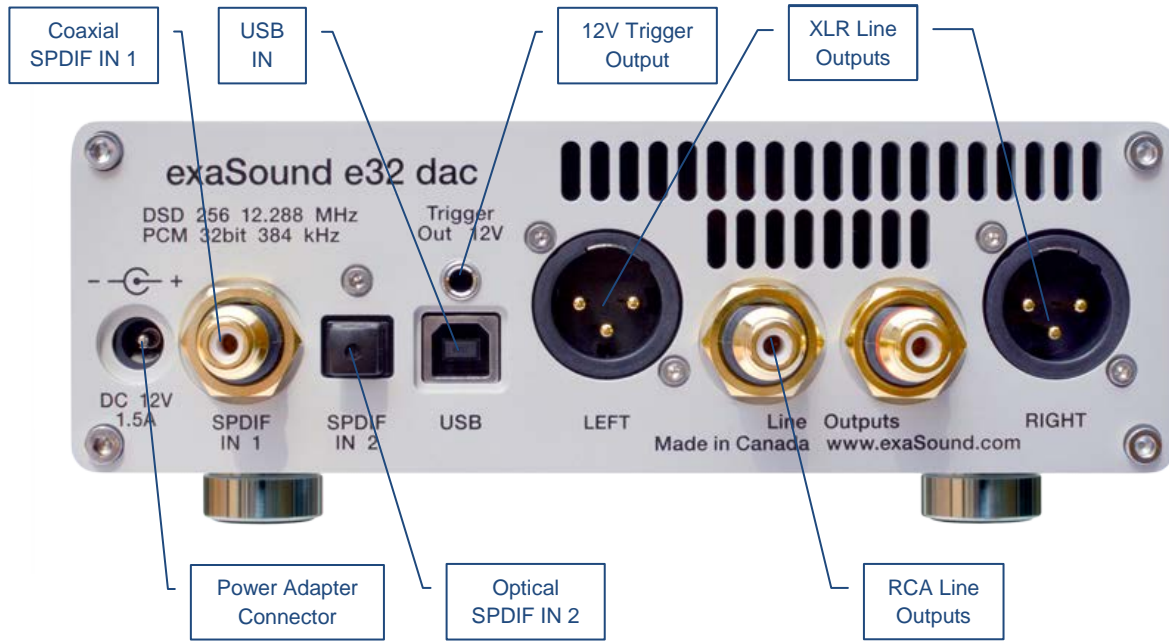
Keep the length of analogue interconnects and speaker cables short for optimal sonic performance. Remember that cables act as filters. Shorter cables have less impact on sonic performance. The shorter cables, the more transparent they become.

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.

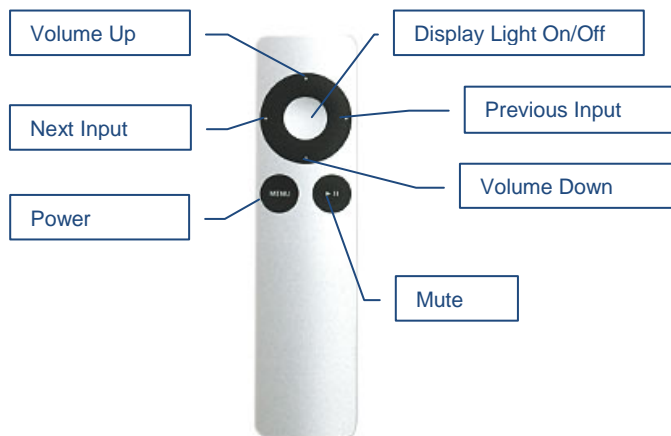
Rear Panel Connectors



SPDIF IN1 - Coaxial SPDIF Input
SPDIF IN2 - Optical TOSLINK SPDIF Input
DC 12V / 1.5A - Power Adapter Connector
 5.5mm O.D. by 2.5mm I.D.
USB - USB connector

RCA Line Outputs - Left / Right
 Analogue Outputs
XLR Line Outputs - Balanced
 Left / Right Analogue Outputs
12V Trigger Output - use to activate trigger-enabled equipment

Infrared Remote Control



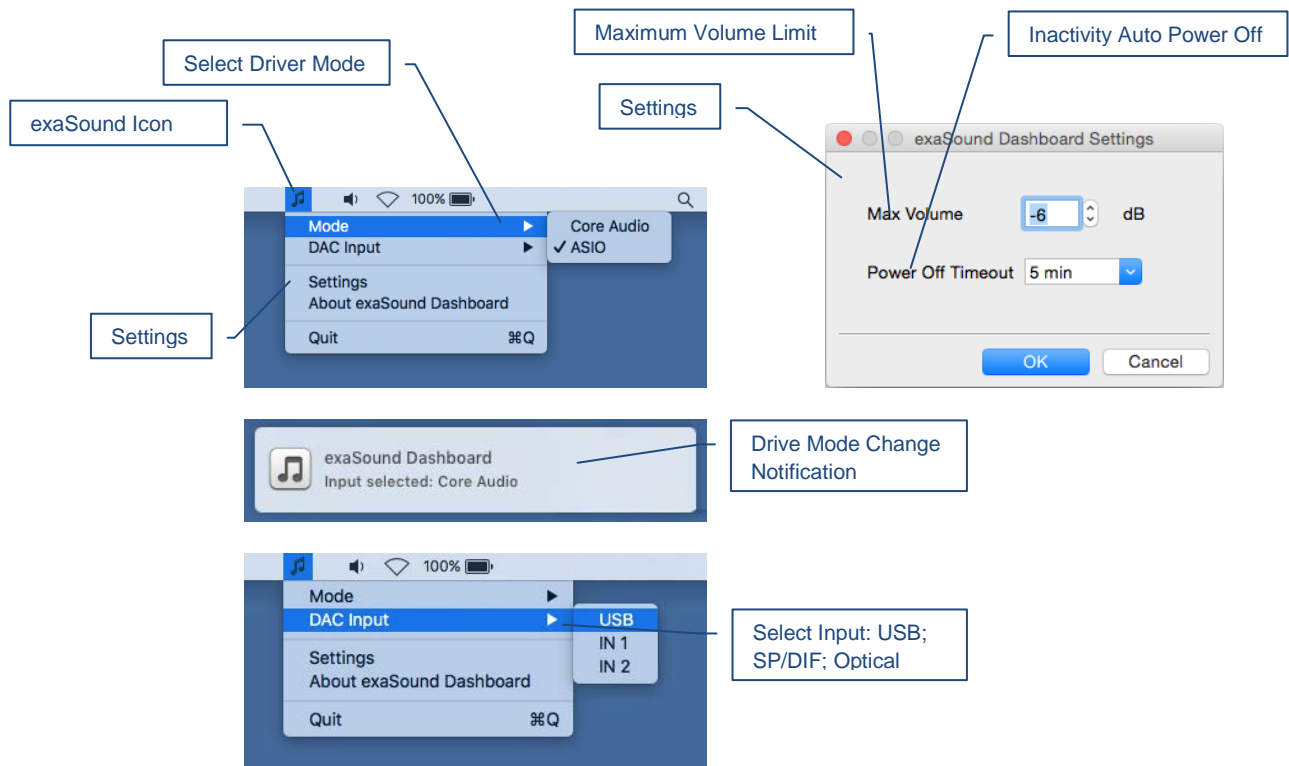
Your DAC is programmed to work with the supplied remote control.

The e32 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 the Apple Remote Control. See the **Remote Control Setup** section for instructions on how to change button assignments and how to pair a different remote control with your e32 DAC.

Driver Setup

1. Login to <http://support.exasound.com>. Download and install the latest **exaSound-OS-X-Drivers**. *Step-by-step setup instructions are available on page 16 of this guide.*
2. When the installation is complete, your Mac will reboot. You will see the exaSound driver in the Audio MIDI Setup.
3. 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: <http://exasound.com/Blog.aspx>.
4. The e32 DAC has an automatic power-on function and it will turn itself on when playback is detected.

exaSound Menu Icon



Audio-MIDI Setup

The screenshot shows the macOS Audio Devices window for the 'exaSound' device. The 'Output' tab is selected. The 'Format' dropdown is set to '2ch-32bit Integer'. The 'Master' volume slider is at 0.66 (-15 dB). The 'Channel Volume' sliders for channels 1 and 2 are both at 1 (0 dB).

Callouts on the left side:

- Use built-in output for alerts and sound effects (points to 'Built-in Output')
- Select the exaSound Core Audio Driver as device for sound output (points to 'exaSound')
- Channel Volume (points to the volume sliders for channels 1 and 2)

Callouts on the right side:

- Select Output (points to the 'Output' tab)
- Use Stereo Mode (points to the '2ch-32bit Integer' format option)
- Master Volume (points to the 'Master' volume slider)

Ch	Volume	Value	dB	Mute
Master	<input type="range"/>	0.66	-15	<input type="checkbox"/>
1:	<input type="range"/>	1	0	<input type="checkbox"/>
2:	<input type="range"/>	1	0	<input type="checkbox"/>

Features

The e32 DAC is based on the ES9028PRO reference DAC chip. It delivers 32-bit precision capable of resolving the smallest signal details. The chip features patented 32-bit HyperStream technology. ES9028PRO delivers the industry's highest performance levels that will satisfy the most demanding audio enthusiasts.

Mac OS High-Performance Driver

We offer a custom high-performance Mac OS driver supporting standard PCM sampling rates from 44.1kHz to 384kHz at 32bit resolution. We support DSD over PCM 1.0 standard, for DSD64 (2.8224 / 3.72 MHz), DSD128 (5.6448 / 6144 MHz) and DSD256 (11.2896 / 12.288 MHz).

Proprietary Mac ASIO Drivers

Using ASIO brings unique advantages that are hard to achieve with the Mac Core Audio system. Our 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.

Automatic PCM / DSD Switching

Audio data is always streamed in its native format. e32 switches automatically between PCM and DSD modes. DSD streams are processed in their native format without conversion to PCM.

Asynchronous USB mode

Asynchronous USB mode eliminates jitter caused by the computer and the USB interface. Asynchronous USB is a two-way communication method between a computer and an external USB DAC. In this method, the DAC is running as a master, and the computer is acting as a slave that delivers data only when requested by the master.

In the case of the e32 DAC, sound data is requested by the FPGA core and stored in the device FIFO memory buffer. The FPGA core makes sure that the buffer never gets empty during playback. Data from the buffer is streamed to the DAC chip. The precision of the timing of the output stream is determined only by the DAC oscillators and it is not degraded in any way by the computer clocks or by delays caused by the USB interface.

Hardware Volume Control and Volume Bypass

The e32 DAC volume is controlled by the ES9028PRO DAC chip. It is completely independent from the Mac 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 and virtually no loss of digital resolution. Setting the volume to 0dB turns all volume processing off and sets the device in volume bypass mode.

Connecting and Powering the e32 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 e32 DAC accepts three digital inputs:

- **USB** - This is the recommended and most capable input. It supports 2 channels PCM up to 32 bit resolution at standard sampling frequencies from 44.1 kHz to 384 kHz, and DSD up to 12.288 MHz.
Connect the e32 DAC to your computer using the supplied A-B USB cable. Most standard A-B USB cables with length up to 6 ft (2m) can be used.
- **SPDIF IN1** - SPDIF Input, 75-ohm RCA. Supports 2 channels 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

The e32 DAC offers two types of analogue line outputs - unbalanced (RCA) and balanced (XLR).

- Make sure that your analogue power amplifier is turned off.
- **RCA Line Outputs - Left / Right** - Connect the Left and Right RCA line outputs of the e32 DAC to the amplifier line inputs.
- **XLR Line Outputs - Left / Right** - Connect the Left and Right XLR line outputs of the e32 DAC to the amplifier line inputs.
- **XLR and RCA can be used simultaneously.**

Trigger Output

When the e32DAC is on, a 12 VDC signal is sent from the Trigger Output to control other devices. When the e32 returns to Standby, 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 e32 DAC. Amplification always brings some level of noise and distortion. Eliminating unnecessary amplification helps to achieve higher level of transparency.



Avoid connecting the e32 DAC to receivers and any other sound processing equipment that performs analogue to digital (ADC) conversion. Digitizing the analogue output signals back to the digital domain for processing will undo some of the benefits that e32 brings to you. Remember that your sound system is as good as the weakest link in the sound processing chain.

Analogue Interconnect Recommendations

Over-engineered interconnects made from exotic materials are unnecessary. When selecting cables, the following characteristics are important:

- Reliable electrical contact
- Low resistance
- Robust mechanical design

Remember that cables act as filters. The shorter the cable, the more transparent your system will be.

Connecting the Power Adapter

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 among the components.



Using an Upgraded Power Supply

The e32 DAC comes with a 12V/1670mA power adapter. This power adapter has been tested to comply with the DAC's quality requirements and allows for very high performance. A better unit may allow you to release the last bit of performance from the e32 DAC.

If you decide to use another power supply, the specifications marked on the back of the e32 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.



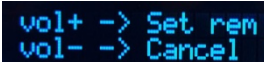
When turning on and off your sound system, the power amplifier should be the last component to be turned on and the first component to be turned off. This prevents power on/off transients from being transmitted to the loudspeakers.

Remote Control Setup

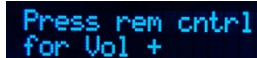
The e32 DAC is programmed to work with the supplied remote control. If you like, you can reprogram the e32 DAC to work with a different IR remote control. The exaSound e32 DAC can be trained to recognise commands from most infrared remote controls using Sony and NEC IR protocols.

Use the following procedure to change remote control button assignments or to pair the e32 DAC with a different remote control:

1. Power on the e32 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 programming mode, or press the **Volume Down** button to cancel the operation.
4. Point the remote control to the e32 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.
6. Press the remote control button for decreasing the volume.
7. Press the remote control button for selecting the next input.
8. Press the remote control button for previous input.
9. Press the remote control button for turning the unit on and off.
10. Press the remote control button 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 e32 DAC is now paired for use with the new IR remote control.



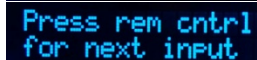
vol+ -> Set rem
vol- -> Cancel



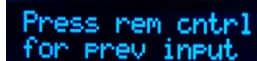
Press rem cntrl
for Vol +



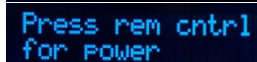
Press rem cntrl
for Vol -



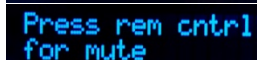
Press rem cntrl
for next input



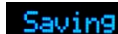
Press rem cntrl
for prev input



Press rem cntrl
for power



Press rem cntrl
for mute



Saving

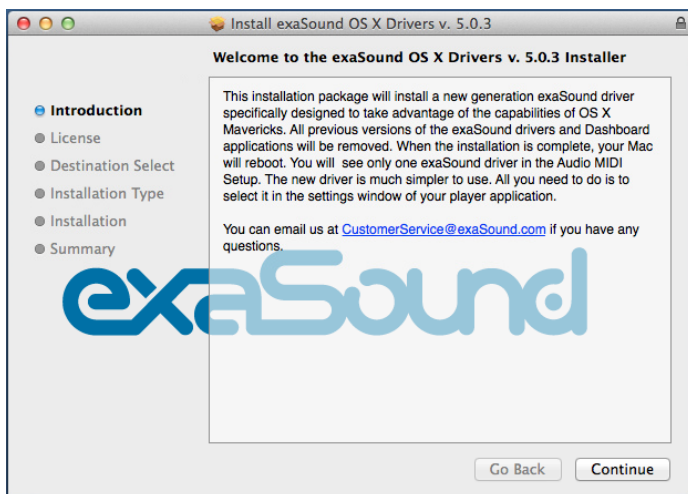
Setup of exaSound e32 Driver and Dashboard for Mac OS

System Requirements

Operating System	Mac OS Mavericks, Yosemite, El Captain, Sierra
Recommended CPU for operating at 352.8 and 384 kHz	2.4GHz dual-core Intel Core i5 or better
Disk Space	10 GB mainly for music files

Software Installation

1. Don't connect the e32 DAC to your Mac until the driver is installed. Don't worry if you've connected the device already. Just disconnect it.
2. You should have received an email from us with username and password. Please login on our support website at <http://support.exasound.com>. Don't use setup packages downloaded from other websites.
3. Download the latest version of the exaSound Drivers Installer for Mac OS:
 - Locate the installation package **exaSound-OS-X-Drivers-5-1-9.pkg** in your *Downloads* folder. (The version number at the end of the file name may be different.)
 - Double-click it 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.



4. Locate the exaSound Dashboard icon on the menu bar. The red exclamation mark indicates that the USB cable is disconnected:



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



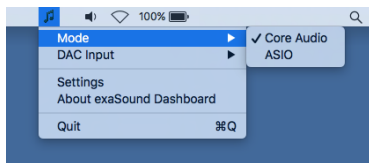
6. Power on the DAC. The red square overlay on the exaSound Dashboard icon indicates that the device is *On* and in *Stop* mode.



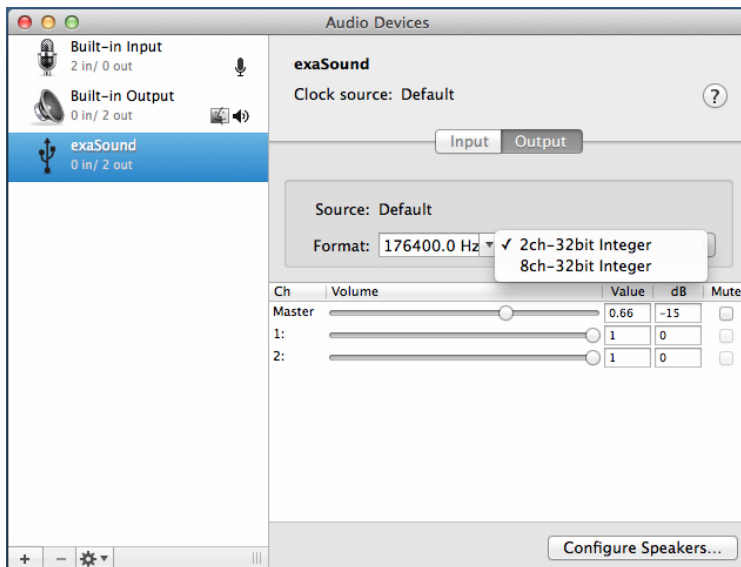
7. During playback the red square changed to a green triangle.



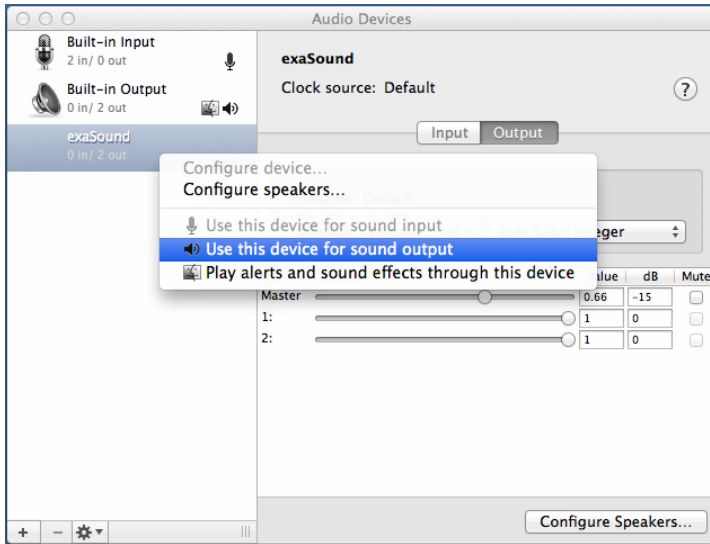
8. Click on the exaSound Dashboard icon and make sure that Core Audio is checked.



9. Go to *Applications -> Utilities* and open *Audio MIDI Setup*. Select the exaSound driver. By default the driver is set to 2-channel (Stereo) mode.



10. Make the exaSound driver the default sound output device.




11. Make sure that the volume is set to less than -25db. At this point you can play some music with iTunes.

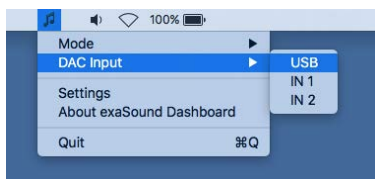
Note: Configuration instructions for various players are available in the Guides section of the exaSound Blog: <http://www.exasound.com/Blog/tabid/74/articleType/CategoryView/categoryId/10/Guides.aspx>.

Using the e32 DAC

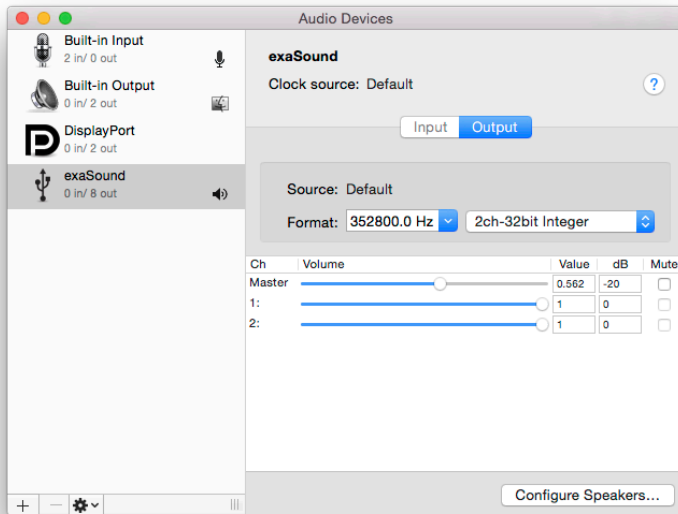
Using the Asynchronous USB Input

	<p>Before turning your amplifiers ON, always check the e32 DAC front panel to make sure that the volume level is below -25dB.</p> <p>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 e32 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.</p> <p>Please note that the e32 DAC will match the volume level of your Mac when it is turned on. This may cause unexpected volume level rising.</p>
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- The e32 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 of 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**.



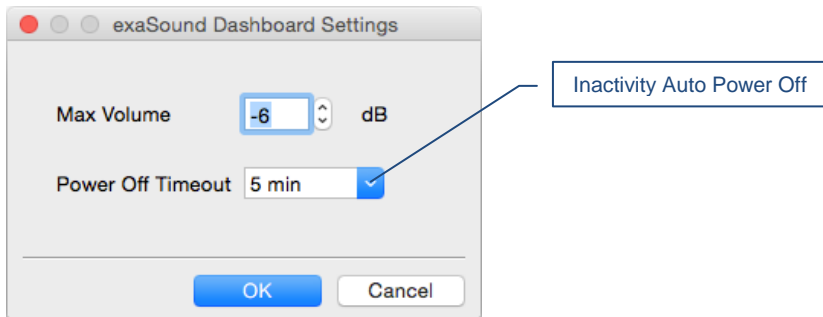
- Lower the volume to at least -25 db. The volume on the e32 DAC can be controlled from the Mac screen, from the device front panel, or with the remote control.



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

Power On/Off

- The e32 DAC has an automatic power-on function and it will turn itself on when playback is detected.
- The e32 DAC automatically turns itself off after a period of inactivity. Use the Power Off Timeout setting to adjust the inactivity time interval before shutdown.



Volume Control

The e32 volume is controlled by the ES9028PRO DAC chip. It is independent from the Mac software volume control 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 match the volume level of your Mac. If the DAC is not connected to your Mac, when turned on the volume level is set to -40 dB.

Use the volume sliders in the Audio MIDI Setup window to control the volume for individual channels and the master volume.

The master volume can also be controlled from the device front panel or using a remote control. When the master volume level is changed, the value displayed on the Mac screen and on the device front panel display are synchronised.

Volume Bypass

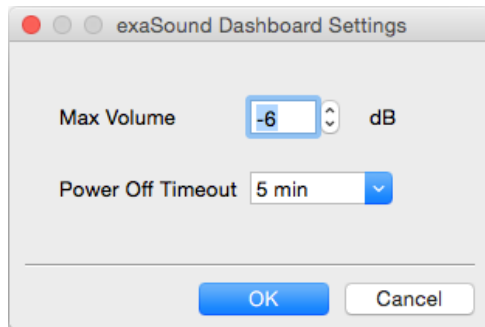
When the volume sliders for the exaSound driver in the Audio MIDI Setup application are set to 0dB, the hardware volume control is turned off and the e32 DAC operates in Volume Bypass Mode.

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.

Settings Menu

- 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 e32 DAC automatically turns itself off after a period of inactivity. Use the *Power Off Timeout* setting to adjust the time interval before shutdown.

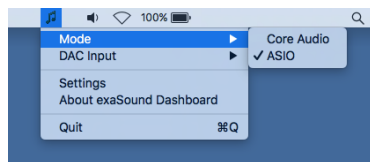


Settings changes may not come into effect until playback is restarted.

Using the exaSound ASIO Drivers for Mac OS

Make sure that the player 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.



Step-By-Step Player Configuration Instructions

Check the *Guides* section of the exaSound blog for player step-by-step configuration instructions:

<http://exasound.com/Blog.aspx>.

Playing Music from SPDIF Sources

The e32 DAC can improve the sonic clarity and fidelity from stereo SPDIF sources. The sound improvement is the result of outstanding jitter cancelling capability, superb signal to noise ratio and low distortion levels of the e32 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 e32 front panel display will flash a **Changing Input** message.
3. The e32 front panel will display information about the input in use, the current sampling rate, and the master volume level.



Specifications

D/A Converter IC:	ESS Technology ES9028PRO 32-bit, 8-channel PRO series DAC
PCM Sampling Rates - Asynchronous USB	44.1kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz, 352.8 kHz, 384 kHz
DSD Sampling Rates - Asynchronous USB	DSD 64 Fs: 2.8224 MHz; 3.072 MHz DSD 128 Fs: 5.6448 MHz; 6.144 MHz DSD 256 Fs: 11.2896 MHz; 12.288 MHz
Sampling Rates-SPDIF Coaxial IN 1	PCM 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz, 176.4 kHz, 192 kHz
Sampling Rates-SDIF Optical IN 2	PCM 44.1 kHz, 48 kHz, 88.2 kHz, 96 kHz
Total Harmonic Distortion + Noise	0.00021% @ 1KHz, 0dBFS
Intermodulation Distortion	-128db 0.00004% @ 19KHz + 20KHz 0 dBFS 2nd order IMD
Signal-to-Noise Ratio	128 dB, A-weighted, 2 Vrms
DAC Master Clock Jitter	0.082 psec (82fsec) rms
Frequency Response	0 Hz - 20 KHz (-0.15dB)
Phase	Non-inverting
Channel Separation	130 dB @ 1KHz
Digital Inputs	USB 2.0, SPDIF Coaxial, SPDIF TOSLINK (optical)
Number of channels	2
Operating System Requirements	Mac OS Mavericks, Yosemite, El Captain, Sierra Windows 8 x86, Windows 8 x64, Windows Server 2012 R2, Windows 7 x86, Windows 7 x64, Windows XP x86 (ASIO Compatible Player is required for all Windows platforms)
Digital Volume Control Steps	0.5 dB
Volume Matching between	Better than 0.1 dB

Channels	
Line Output	Balanced (XLR), Unbalanced (RCA), gold-plated contacts (XLR and RCA line outputs can be used simultaneously)
Line Output Level	4.5Vrms (balanced) 2.2 Vrms (unbalanced)
Line Output Impedance	200 ohms
Line Output Offset	< 5 mV
Headphone Amp Current Output	500 mA peak
Headphone Amp Output Impedance	0.5 Ohm, 20Hz-20KHz
Headphone Amp Output	0-7V
Headphone Amp THD+N	0.0012%, 1Vrms into 60ohms
Headphone Amp Intermodulation Distortion 1Vrms into 60ohms 19kHz + 20kHz 2nd order IMD	-128db 0.00004%
Headphone Jack	1/4" TRS SE
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)

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 REGISTER YOUR PURCHASE FOR WARRANTY, please visit the following Web site:
<http://www.exasound.com/registration.aspx>

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>.