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DacMagic 100

 **Cambridge Audio**

Your music + our passion

## Contents

Introduction .....	3
Important safety instructions .....	4
Limited warranty .....	7
Rear panel connections.....	8
Front panel controls.....	10
Audio output connections.....	11
Digital audio input connections .....	12
PC-USB connections .....	13
Auto Power Down (APD).....	16
Troubleshooting .....	17
Technical specifications .....	18

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This guide is designed to make installing and using this product as easy as possible. Information in this document has been carefully checked for accuracy at the time of printing; however, Cambridge Audio's policy is one of continuous improvement, therefore design and specifications are subject to change without prior notice.

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## Introduction

Thank you for purchasing this Cambridge Audio DacMagic 100 Digital to Analogue Converter. We are confident that you will enjoy many years of listening pleasure from it. Like all Cambridge Audio products, the DacMagic 100 adheres to our three core principles – stunning performance, ease of use and incredible value.

Three digital inputs are fitted (2x S/P DIF and 1x TOSLINK) which allow a wide range of digital sources to be connected. In addition, a USB input enables the DacMagic 100 to be connected to a PC and act as a very high quality external DAC/Soundcard, offering genuine HiFi-quality playback from a laptop, desktop, media PC, etc.

Up to 24-bit content is supported via both the USB Audio and Digital Inputs. A latest generation Wolfson WM8742 24-bit Digital to Analogue converter is featured.

The USB input features asynchronous transfer for extremely low jitter.

With Windows PCs the DacMagic 100 can operate driverlessly (i.e. use Windows own built-in driver) at up to 24-bit/96kHz resolution.

In addition our own Windows driver (downloadable from [www.cambridge-audio.com/DacMagic100-Support](http://www.cambridge-audio.com/DacMagic100-Support)) allows up to 24-bit/192kHz operation and supports both kernel streaming and ASIO.

Mac PCs already support up to 24-bit/192kHz USB transfer natively.

Your DacMagic 100 can only be as good as the system it is connected to. Please do not compromise on your amplifier, speakers or cabling. Naturally, we particularly recommend amplification from the Cambridge Audio range. Your dealer can also supply excellent quality Cambridge Audio interconnects to ensure your system realises its full potential.

Thank you for taking the time to read this manual; we recommend you keep it for future reference



Matthew Bramble  
Cambridge Audio Technical Director  
and the DacMagic 100 design team

## Important safety instructions

For your own safety please read the following important safety instructions carefully before attempting to connect this unit to the mains power supply. They will also enable you to get the best performance from and prolong the life of the unit:

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 a 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 are 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 plugs, convenience receptacles and the point where they exit from the apparatus.
11. Only use attachments/accessories specified by the manufacturer.
12. Unplug this apparatus during lightning storms or when unused for long periods of time.
13. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power-supply adaptor having been damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.

### WARNING

**- To reduce the risk of fire or electric shock, do not expose this unit to rain or moisture.**

The unit must be installed in a manner that makes disconnection of the mains adaptor from the mains socket outlet (or appliance connector from the rear of the unit) possible. Where the mains adaptor is used as the disconnect device, the disconnect device shall remain readily operable. Only use the mains adaptor supplied with this unit.

Please ensure there is ample ventilation (at least 10cm clearance all round). Do not put any objects on top of this unit. Do not situate it on a rug or other soft surface and do not obstruct any air inlets or outlet grilles.

This unit must not be used near water or exposed to dripping or splashing water or other liquids. No objects filled with liquid, shall be placed on the unit.



The lightning flash with the arrowhead symbol within an equilateral triangle is intended to alert the user to the presence of un-insulated '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 instructions in the service literature relevant to this appliance.



#### WEEE symbol

The crossed-out wheeled bin is the European Union symbol for indicating separate collection for electrical and electronic equipment. This product contains electrical and electronic equipment which should be reused, recycled or recovered and should not be disposed of with unsorted regular waste. Please return the unit or contact the authorised dealer from whom you purchased this product for more information.



#### CE mark

This product complies with European Low Voltage (2006/95/EC), Electromagnetic Compatibility (2004/108/EC) and Environmentally-friendly design of Energy-related Products (2009/125/EC) Directives when used and installed according to this instruction manual. For continued compliance only Cambridge Audio accessories should be used with this product and servicing must be referred to qualified service personnel.



#### C-Tick mark

This product meets the Australian Communications Authority's Radio communications and EMC requirements.



#### Gost-R mark

This product meets Russian electronic safety approvals.

#### FCC regulations

**NOTE: THE MANUFACTURER IS NOT RESPONSIBLE FOR ANY RADIO OR TV INTERFERENCE CAUSED BY UNAUTHORIZED MODIFICATIONS TO THIS EQUIPMENT. SUCH MODIFICATIONS COULD VOID THE USER AUTHORITY TO OPERATE THE EQUIPMENT.**



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:

- Re-orient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

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; 2) This device must accept any interference, including interference that may cause undesired operation.

## Important safety instructions cont.

### Ventilation

**IMPORTANT** – The unit will become warm when in use. Do not stack multiple units on top of each other. Do not place in an enclosed area such as a bookcase or in a cabinet without sufficient ventilation.

Ensure that small objects do not fall through any ventilation grille. If this happens, switch off immediately, disconnect from the mains supply and contact your dealer for advice.

### Positioning

Choose the installation location carefully. Avoid placing it in direct sunlight or close to a source of heat. No naked flame sources, such as lighted candles, should be placed on the unit. Also avoid locations subject to vibration and excessive dust, cold or moisture. The unit can be used in a moderate climate.

This unit must be installed on a sturdy, level surface. Do not place in a sealed area such as a bookcase or in a cabinet. Do not place the unit on an unstable surface or shelf. The unit may fall, causing serious injury to a child or adult as well as serious damage to the product. Do not place other equipment on top of the unit.

Due to stray magnetic fields, turntables or CRT TVs should not be located nearby due to possible interference.

Electronic audio components have a running in period of around a week (if used several hours per day). This will allow the new components to settle down and the sonic properties will improve over this time.

### Power sources

The unit should be operated only from the type of power source indicated on the marking label. If you are not sure of the type of power-supply to your home, consult your product dealer or local power company.

To turn the unit off, switch off at the front panel. If you do not intend to use this unit for a long period of time, unplug it from the mains socket.

### Overloading

Do not overload wall outlets or extension cords as this can result in a risk of fire or electric shock. Overloaded AC outlets, extension cords, frayed power cords, damaged or cracked wire insulation and broken plugs are dangerous. They may result in a shock or fire hazard.

Be sure to insert each power cord securely. To prevent hum and noise, do not bundle the interconnect leads with the power cord or speaker leads.

### Cleaning

To clean the unit, wipe its case with a dry, lint-free cloth. Do not use any cleaning fluids containing alcohol, ammonia or abrasives. Do not spray an aerosol at or near the unit.

### Servicing

These units are not user serviceable. Never attempt to repair, disassemble or reconstruct the unit if there seems to be a problem. A serious electric shock could result if this precautionary measure is ignored. In the event of a problem or failure, please contact your dealer.

## Limited warranty

Cambridge Audio warrants this product to be free from defects in materials and workmanship (subject to the terms set forth below). Cambridge Audio will repair or replace (at Cambridge Audio's option) this product or any defective parts in this product. Warranty periods may vary from country to country. If in doubt consult your dealer and ensure that you retain proof of purchase.

To obtain warranty service, please contact the Cambridge Audio authorised dealer from which you purchased this product. If your dealer is not equipped to perform the repair of your Cambridge Audio product, it can be returned by your dealer to Cambridge Audio or an authorised Cambridge Audio service agent. You will need to ship this product in either its original packaging or packaging affording an equal degree of protection.

Proof of purchase in the form of a bill of sale or receipted invoice, which is evidence that this product is within the warranty period, must be presented to obtain warranty service.

This Warranty is invalid if (a) the factory-applied serial number has been altered or removed from this product or (b) this product was not purchased from a Cambridge Audio authorised dealer. You may call Cambridge Audio or your local country Cambridge Audio distributor to confirm that you have an unaltered serial number and/or you made a purchase from a Cambridge Audio authorised dealer.

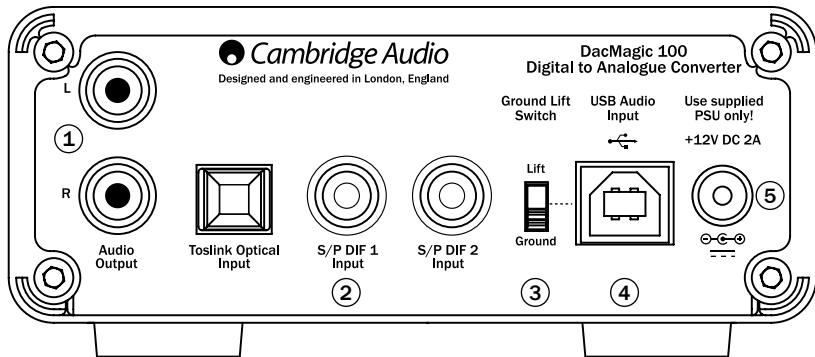
This Warranty does not cover cosmetic damage or damage due to acts of God, accident, misuse, abuse, negligence, commercial use, or modification of, or to any part of, the product. This Warranty does not cover damage due to improper operation, maintenance or installation, or attempted repair by anyone other than Cambridge Audio or a Cambridge Audio dealer, or authorised service agent which is authorised to do Cambridge Audio warranty work. Any unauthorised repairs will void this Warranty. This Warranty does not cover products sold AS IS or WITH ALL FAULTS.

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Some countries and US states do not allow the exclusion or limitation of incidental or consequential damages or implied warranties so the above exclusions may not apply to you. This Warranty gives you specific legal rights, and you may have other statutory rights, which vary from state to state or country to country.

For any service, in or out of warranty, please contact your dealer.

## Rear panel connections





### ① Audio outputs

Single-ended conventional stereo outputs for connection to the line-level Phono/RCA inputs of an amplifier.

### ② Digital inputs

Three digital inputs are fitted (2x S/P DIF and 1x TOSLINK) which allow a wide range of digital sources to be connected.

**S/P DIF co-axial** – to obtain best results, use a high quality 75 ohm digital RCA interconnect cable (not one designed for normal audio use).

**TOSLINK optical** – use a high quality TOSLINK fibre-optic interconnect cable designed specifically for audio use.

**Note:** This unit only accepts two-channel LPCM digital audio (e.g. Stereo PCM or Dolby Digital 2.0). You cannot connect a Dolby Digital 5.1 or a DTS signal as they will not be recognised. If you wish to connect a DVD or similar device, please ensure that the sound output of your player is set to two-channel PCM.

### ③ Ground/Lift switch

When Grounded the Dacmagic 100 is connected to the earth connection of the PC directly. When Lifted the ground connection is made via a network designed to break any hum loops that may be caused by the source equipment.

We advise using the Grounded setting unless audible hum is experienced.

### ④ USB in

A USB B type socket is fitted to the DacMagic 100 to enable the playback of audio from a personal computer running either Microsoft Windows or Apple Mac OS X operating systems. Some builds of Linux are also suitable.

**Note:** Always use a certified cable for USB Audio, preferably one that displays an official mark. For USB Audio 2.0 the cable should be the 'Hi-Speed USB' certified. USB cable connections longer than 3m may result in inconsistent audio performance.

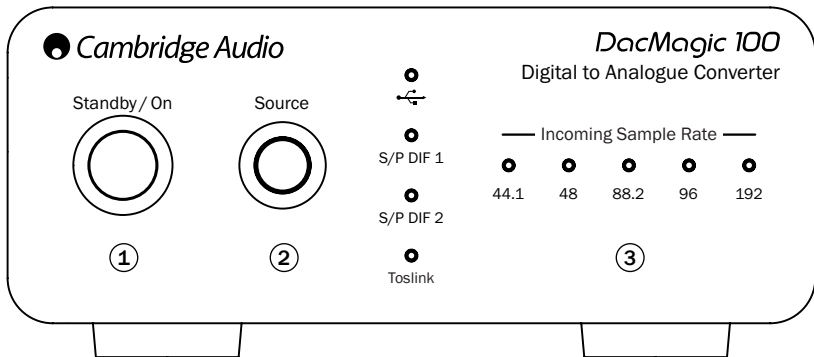
### ⑤ DC 12V 2A power adaptor socket.

Once you have completed all connections, plug the supplied power adaptor into the DacMagic 100.

This product has APD (Auto Power Down) enabled as default. After inactivity of 60 minutes, the product will automatically switch to Standby. See later section for further details.

**Important Note:** Use the supplied power supply unit **ONLY**.

## Front panel controls



### ① Power on/stdby

Switches the unit between on and low power standby where the DacMagic 100 is off and the PSU draws <0.5W.

### ② Source

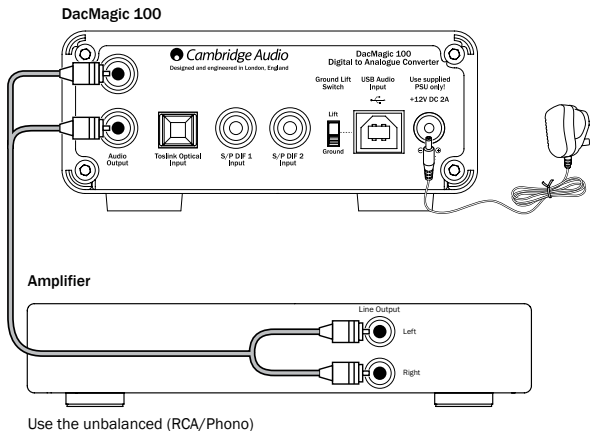
Press to select between USB, SPDIF 1, SPDIF 2 & Toslink. The corresponding LED will light up to show which source has been selected.

### ③ Incoming sample rate

In the presence of an incoming digital stream, the relevant LED will light up to indicate the incoming digital sampling frequency (between 44.1kHz and 192kHz). For 32kHz material, the DacMagic 100 will still operate but no LED will be lit.

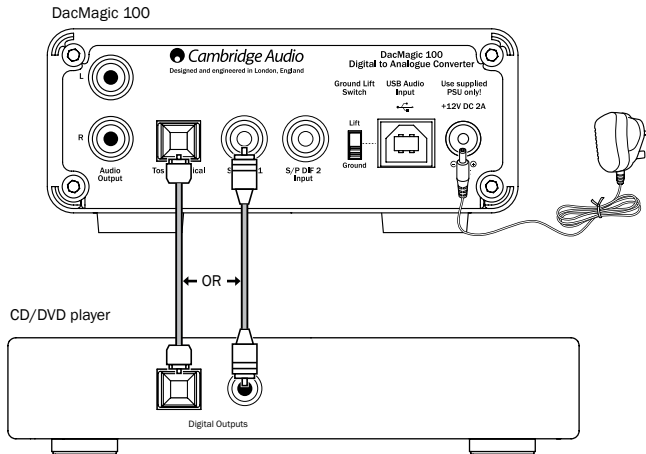
## Audio output connections

**Note:** Do not turn on the unit until all connections have been made.



## Digital audio input connections

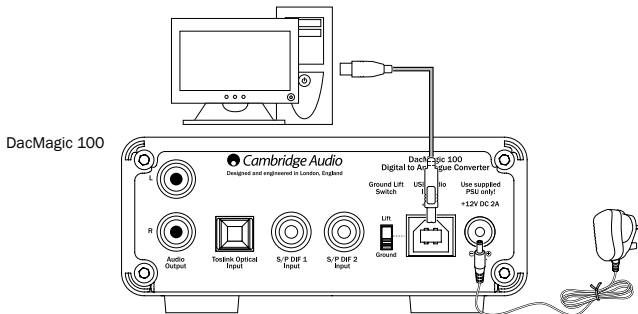
**Note:** Do not turn on the unit until all connections have been made.



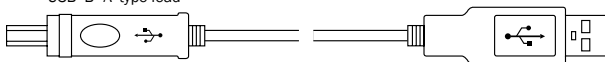
Connect your digital source to SPDIF 1, SPDIF 2 or TOSLINK. Up to 3 can be connected.

## PC-USB connections

**Note:** Do not turn on the unit until all connections have been made.



USB 'B-A' type lead



**Note:** Always use a certified cable for USB Audio, preferably one that displays an official USB Audio 2.0 the cable should be the 'Hi-Speed USB' certified. USB cable connections longer than 3m may result in inconsistent audio performance.

## Advanced USB audio

The DacMagic 100 is both USB 2.0 (Hi-Speed) and USB 1.1 (Full-speed) USB port compatible.

It will also work with the new USB 3.0 ports where the PC will simply treat the DacMagic 100 as if it were a USB 2.0 or 1.1 device.

The DacMagic 100 also supports two USB Audio protocols (not the same as the port types themselves) USB Audio 1.0 (which works over USB 1.1 ports and supports up to 24-bit/96kHz) or USB Audio 2.0 (which requires a USB 2.0 port and can support up to 24-bit/192kHz).

The default configuration is USB 1.1 and USB Audio 1.0 which works with nearly all common operating systems and computer types without drivers and supports up to 24-bit/96kHz audio, simply plug in and play.

In this configuration the DacMagic 100 is able to work at up to 24-bit/96kHz by declaring to your computer that it can handle any sample rate from 32kHz to 96kHz.

However in some Windows/Mac operating system variants the operating system itself may restrict or fix the output sample rate or re-sample the audio.

See our online guide at [www.cambridge-audio.com/DacMagic100Support](http://www.cambridge-audio.com/DacMagic100Support) on USB Audio for more details on this. With careful choice of playback software and settings many pitfalls can be avoided.

In particular our free Windows USB Audio 2.0 driver (available from our website) supports up to 24-bit/192kHz audio and WASPI Exclusive or ASIO modes that can give enhanced performance.

A brief explanation of your choices is below:

## Switching between USB Class 1 and USB Class 2 operation

Your DacMagic 100 will come set to driverless USB Audio Class 1.0 by default, but it can be configured to run in either USB Class Audio 1.0 or 2.0 mode. To change USB Class, press & hold the Source button while bringing the unit out of standby. One of the digital input source LEDs will illuminate to indicate the current USB setting: Digital 1 represents USB Audio Class 1.0, likewise Digital 2 is USB Audio Class 2.0.

## Use with PCs

With the DacMagic 100 switched to USB Audio 1.0 (this is the default setting) the DacMagic 100 will work with the native Windows XP, Vista or 7 Audio 1.0 driver (no need to load any new driver) and accept audio up to 24-bit/96kHz.

With the DacMagic 100 switched to USB Audio 2.0 the DacMagic 100 needs the Cambridge Audio USB Audio 2.0 Driver to be loaded and can then accept up to 24-bit/192kHz (and support ASIO and WASAPI Exclusive if required).

The driver is available from [www.cambridge-audio.com/DacMagic100Support](http://www.cambridge-audio.com/DacMagic100Support).

### Use with Macs

No extra drivers are required. With the DacMagic 100 switched to USB Audio 1.0 the DacMagic 100 will work with the native Mac OS-X 10.5 (Leopard) or above Audio 1.0 driver and accept audio up to 24/96kHz.

With the DacMagic 100 switched to USB Audio 2.0 the DacMagic 100 works with the native Mac OS-X 10.5 (Leopard) or above Audio 2.0 driver and can accept audio up to 24/192kHz.

### Use with Linux

For most builds of Linux with the DacMagic 100 switched to USB Audio 1.0 the DacMagic 100 will work with the native Audio 1.0 driver and accept audio up to 24-bit/96kHz.

Some very new builds of Linux are now supporting USB Audio 2.0 for which the Dacmagic 100 should be switched to Audio 2.0 support to accept audio up to 24-bit/192kHz.

For both cases, because Linux builds vary according to their creators choice of software components (including drivers) it is not possible to guarantee operation and Audio drivers may need to be loaded.

'Class drivers' as they are called for generic support of Audio Class 1.0 or Audio Class 2.0 devices may be available from the Linux community, we do not supply these.

### Bit perfect transfer – ASIO and WASAPI Exclusive mode

The DacMagic 100 USB interface hardware and software support bit perfect transfer.

Whether or not the audio sent to the DacMagic 100 is bitperfect (i.e. not resampled or mixed etc. by the PC) is actually a function of the playback application and the operating systems audio engine.

By default the standard windows audio drivers (often called WDM drivers) included in Windows XP support MME or DirectSound transfer, both of which include a kernel mixer and re-sampler stage.

One way round this is to use ASIO to bypass this. Another is to use a playback application that supports its own form of kernel streaming, i.e. if has its own way of outputting the audio without invoking the kernel mixer.

For Windows Vista and Windows 7 a new method of audio transfer is supported called WASAPI. This has two modes; Shared and Exclusive. Shared mode is similar to MME or DirectSound but in Exclusive mode the kernel mixer/re-sampler is bypassed and bit perfect transfer is possible with only one audio playback program directed to the soundcard at a time (for instance system sounds are not mixed in).

To ensure bit perfect transfer use a playback application that supports ASIO, WASAPI in Exclusive mode (if you have Windows Vista or Windows 7) or some form of kernel streaming.

This is a fast moving area so we would encourage you to check the web for the latest media players to support these more audiophile playback options.

To use ASIO you will need the Cambridge Audio Sound Driver installed and the DacMagic 100 switched to USB Audio 2.0.

No further settings are required as the driver automatically supports ASIO transfer, all that is required is to load and setup suitable ASIO enabled playback software.

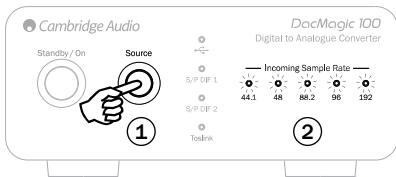
ASIO (Audio Stream Input/Output) is a non Microsoft audio driver protocol for Windows originally invented by Steinberg ltd ASIO bypasses some of the normal audio path from the playback application through the Windows audio system (including the Kernel Mixer) for a more direct path to the DacMagic 100.

You will need to install and use a suitable playback application that supports ASIO output either natively or via a plugin. One example of such an application with a suitable plugin is Foobar, see <http://www.foobar2000.org> for more details.

## Auto Power Down (APD)

This product has APD (Auto Power Down) enabled as default. After inactivity of 60 minutes, the product will automatically switch to Standby.

To disable this feature, turn the unit on by pressing the Standby/On button. Now while the DacMagic 100 is on, press and hold the Source button for approximately 5 seconds:



The 'Incoming Sample Rate' LED will flash to indicate that the APD function has been disabled. Repeat the same process to enable this function again.



## Troubleshooting

### There is no power

Ensure the supplied AC adaptor is connected securely to the PSU socket on the rear panel.

Ensure that the correct mains transformer is being used and that it complies with the local electrical supply.

Ensure the mains plug is fully inserted into the wall socket and is switched on.

### There is no sound

Ensure that the amplifier is set correctly. Check that the interconnects are inserted correctly. Check that the correct digital input is selected (Incoming Sample Rate LED should be on).

### A low hum or buzzing sound can be heard

Power cords or lighting placed near this product. Analogue inputs are not securely connected.

For USB try selecting the 'Lift' position by moving the Ground/Lift switch.

## Technical specifications

D/A converters.....	Wolfson WM8742 24-bit DAC
Frequency response .....	20Hz to 20kHz ( $\pm 0.1$ dB)
THD @ 1kHz 0dBfs.....	<0.0025% 24-bit
THD @ 1kHz -10dBfs .....	<0.0025% 24-bit
THD @ 20kHz 0dBfs .....	<0.0025%
S/N ratio.....	-113dB
Total correlated jitter .....	<130pS
Crosstalk @ 1kHz.....	< -130dB
Crosstalk @ 20kHz .....	< -112dB
Output impedance.....	<50ohms
Max output level (unbalanced) .....	2.3V rms
Digital input word widths supported .....	16/24-bit
Digital input sampling frequencies supported .....	32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 192kHz
USB 1.0.....	24-bit 44.1kHz, 48kHz, 96kHz
USB 2.0 .....	16/24-bit 44.1kHz, 48kHz, 88.2kHz, 96kHz, 192kHz
Max power consumption .....	5W
Dimensions (H x W x D).....	46 x 106 x 130mm
Weight .....	0.5kg/1.1lbs

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London SE1 4BB, United Kingdom  
Registered in England No. 2953313

**[www.cambridge-audio.com](http://www.cambridge-audio.com)**



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