

# M-DAC

## User Instructions

audiolab





# 1: Important Safety Information



This symbol indicates that there are important operating and maintenance instructions in the literature accompanying this unit.



This symbol indicates that dangerous voltage constituting a risk of electric shock is present within this unit.

Read these instructions.

Keep these instructions.

Heed all warnings.

Follow all instructions.

Do not use this apparatus near water.

Clean only with a slightly damp cloth.

Do not block any ventilation openings.

Install in accordance with the manufacturer's instructions.

Do not install or operate near any heat sources such as radiators, stoves, or other apparatus that produce heat.

Unplug this apparatus during lightning storms or when unused for long periods of time.

Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as the power-supply cord or plug is 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 electrical shock, do not expose this product to rain or moisture. The product must not be exposed to dripping and splashing and no object filled with liquids such as a vase of flowers should be placed on the product.

No naked flame sources such as candles should be placed on the product.

**Caution:** Changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this device.

**Caution:** Usage of controls or adjustments or performance of procedures other than those specified herein may result in hazardous exposure.

Only use attachments/accessories specified by the manufacturer.

## IMPORTANT

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 communication. However, this 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 of the following measures:

- Reorient 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.


## ELECTRICAL INFORMATION

The equipment must be used only with the supplied AC adaptor or with a power supply expressly intended for use with the equipment and conforming to the mains supply voltage of the area in which it is intended that the product be used.

Protect the power cord from being walked on or pinched particularly at the plugs, convenience receptacles, and at the point where they exit from the apparatus.

The mains operating voltage of the power supply is marked on the unit rating plate.

The means of disconnecting the product from the mains supply is via the mains plug on the power cord of the adaptor. This must be unobstructed and freely accessible at all times.

 This equipment is a Class II or double insulated electrical appliance. It has been designed in such a way that it does not require a safety connection to electrical earth.

**WARNING:** The battery (battery or batteries or battery pack) shall not be exposed to excessive heat such as sunshine, fire or the like

## 2: Getting Started

The Audiolab M-DAC is a fully-featured DAC of advanced specification and performance. Please read this manual carefully before installing and operating the unit so that you can enjoy to the full the outstanding qualities and many unusual features of this unit.

Your M-DAC's performance is determined by the care you take in setting your system up: this includes all connected sources.

### Signal Inputs:

- Two external SPDIF stereo LPCM coaxial digital inputs
- Two external SPDIF stereo LPCM optical digital inputs
- USB 2.0 port for replaying stereo from a compatible host.

### Signal Outputs:

- Balanced and unbalanced stereo analogue outputs .
- Optical and coaxial digital outputs individually selectable between re-clocked SPDIF and/or master clock (clock-lock) output.

### Operating Features:

- Automatic detection and decoding of external digital input sources.
- Selectable digital filter settings.
- Fully variable output in the digital domain maintaining absolute fidelity with the straightest possible signal path.
- "Bit Perfect" Data source analyser. Least Significant bit (LSB) correction to facilitate bit-accurate replay with Windows XP Direct Sound.
- Signal level peak reading meter.
- Asynchronous USB buffer level indicator.
- D3E Decorrelator. The D3E engine removes fixed data patterns and replaces these with stochastic data, randomising the internal processes at the DAC's silicon level.
- Mute and balance controls
- Infra Red I/O to enable system control with one handset

- Analogue output level selectable between fixed and variable.

**Note:** Connect the analogue outputs of the M-DAC directly to a power amplifier. Set any gain control/s on the power amplifier/s to maximum and use the volume control on the M-DAC to alter the level. If you wish to connect the M-DAC into a pre-amplifier, you may disable the volume control. In this mode the unit behaves as a fixed-gain DAC operating in the digital domain. Refer to Page 21 for this mode of operation.

### Unpacking

Unpack the product fully. The carton should contain:

- The Audiolab M-DAC
- One M-DAC power supply suitable for your area.
- Remote handset and two AAA batteries.
- This instruction manual.

If an item is missing or damaged report this to your dealer as soon as possible. Retain the packing for safe transport of your unit. If you dispose of the packing, do so with regard to any recycling regulations in your area.

### Placement

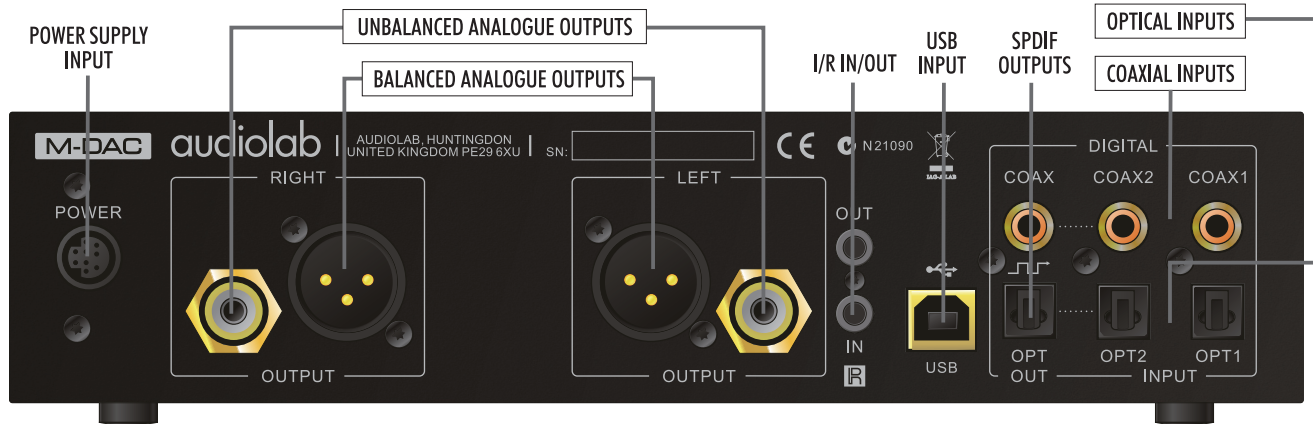
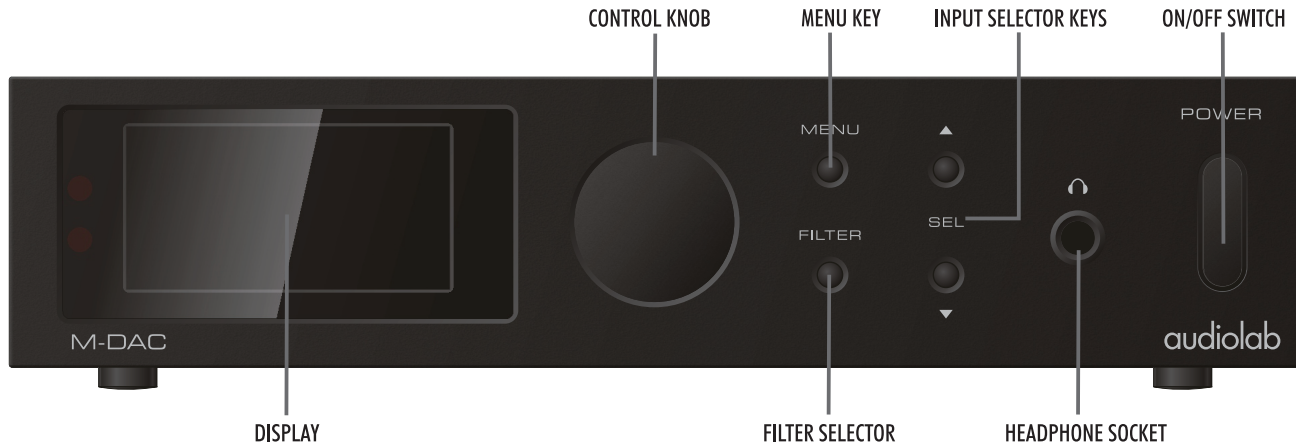
The unit is designed to run warm during normal operation but ensure you do not block any ventilation openings.

Place the unit on a sturdy shelf or table. If you use an equipment rack ensure the unit has adequate ventilation and is on its own shelf. To minimise any interference place the power supply in a stable location as far from sensitive analogue inputs as possible.

Ensure your mains voltage corresponds to the rating plate on the rear of the product's power supply. If in doubt, consult your dealer. If you move to an area with a different mains voltage seek advice from an Audiolab appointed dealer or a competent service technician.

Make sure you locate the unit so that the front panel is in view otherwise the infrared-remote handset will not work.

# 3: Controls and Connectors

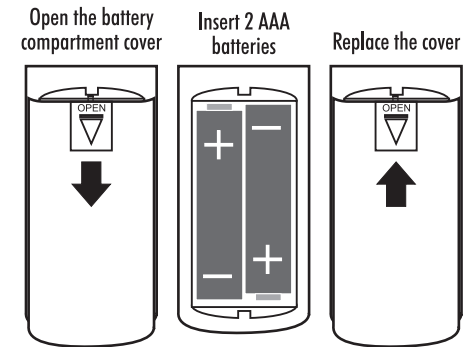


# 4: Remote Handset

1		Press to mute the output. Press and hold to mute the output by -10dB
2		Stop USB playback Leave Menu Mode
3		Press to move to the next track (USB input) Press and hold to Fast Forward Search (USB input)
4		Press once to display the current Balance level Press and hold to alter Balance to the Right
5	MENU	Press to enter/leave Menu Mode.
6	SEL	Select an input.
7	VOL +/-	Increase/Decrease the volume.
8		Press to select a filter characteristic.
9		Press once to display the current Balance level Press and hold to alter Balance to the Left.
10		Press to move to the previous track (USB input) Press and hold to Fast Reverse Search (USB input)
11		Press to play/pause a track (USB input)

## Fitting Batteries

Open the cover. Unwrap the supplied AAA batteries and place them in the battery compartment with the polarity as shown. Replace the cover.



Always use AAA batteries and always replace them in sets. Never mix old and new batteries. Very weak batteries can leak and damage the handset. Replace them in good time!

There is a risk of fire and burns if a battery is handled improperly. Do not disassemble, crush, puncture, short external contacts, or dispose of in fire or water.

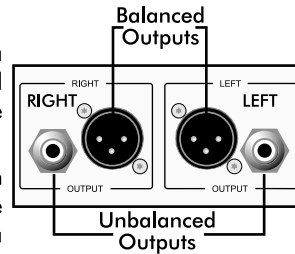
Do not attempt to open or service a battery. Discard used batteries in full accordance with recycling regulations in force in your area.

# 5: Inputs and Outputs

## ANALOGUE OUTPUTS

**Balanced Output:** If your amplifier has a balanced input use the balanced connection for best results. You need one XLR balanced cable per channel.

**Unbalanced Output:** Connect a high quality screened RCA phono lead from the unbalanced outputs of the M-DAC to a suitable input of the amplifier.



## HEADPHONE OUTPUT

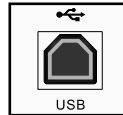
A stereo 6.3mm (1/4") jack is provided on the front panel for connecting headphones. Connecting headphones mutes the audio output signal.



**Caution:** When using headphones, playing music at very high volumes may permanently damage your hearing.

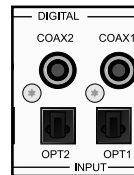
## USB PORT

Use a certified USB2.0 cable. Connect the cable to the M-DAC and then to the USB port on the digital source. If the media player on your computer features stereo and multichannel output, set the output of the media player to stereo.



## DIGITAL (SPDIF) INPUTS

Four digital inputs (two Co-axial and two Optical) are provided for connecting the M-DAC to an external SPDIF source. Connect a suitable video or optical cable from the SPDIF output of the source component to the appropriate input of the M-DAC.

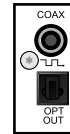


If you are connecting a multichannel source, access the menu of the source component and set the SPDIF output to (L)PCM Stereo with the Subwoofer OFF. If you set the output to RAW (multichannel) the M-DAC will mute and the word "Bitstream" will appear in the display.

## DIGITAL OUTPUTS

Two digital inputs (one Co-axial and one Optical) are provided and can be individually configured: (See P. 8)

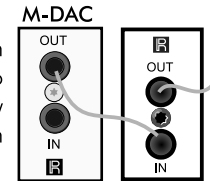
- 1) SPDIF Output. In this configuration a stable and essentially "jitter free" version of the input signal is available for connection to an external digital processor.
- 2) "Clock-Lock" interface – This provides a "Jitter Free" Clock-Locked connection with compatible CD transports etc.



Connect a suitable video or optical cable from the appropriate SPDIF output of the M-DAC to the input of the DAC or CD transport.

## I/R CONNECTIONS

A 3.5mm remote control bus facilitates connection to suitably equipped Audiolab components and to multi-room controllers etc. By connecting suitably equipped units in a 'daisy chain' you can establish control over an entire system with one handset.



## POWER INPUT

The M-DAC should only be connected to a power supply designed exclusively for this unit. Connect the multi-pole output from the AC adapter to the Power connector at the rear panel of the M-DAC and then connect the Adapter to the mains supply.



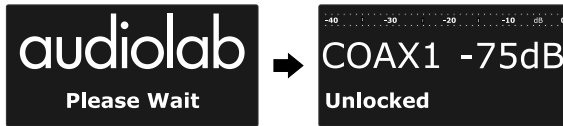
The supplied AC adaptor uses a large mains transformer. To minimise any interference place the power supply in a well-ventilated stable location as far from sensitive analogue inputs as possible.

## Switching On and Off

Connect power to all system units and the M-DAC power adapter. Switch the mains on. Switch on the M-DAC at the front panel. Switch on the power amplifier/s.

**When switching off:** switch off the amplifier *first*.

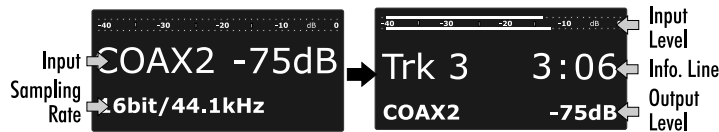
**When the M-DAC is switched on:** The display shows the welcome screen. After a short period the unit boots, and defaults to the last used input and Volume level.



## Selecting a Coaxial/Optical Input

Press a SEL button on the handset or the front panel to select the wanted input.

When the input is selected and locked, the front panel displays the input source frequency. Track and time information from a CD/DVD transport may also be displayed if enabled in the M-DAC menu.



If the display reads “Unlocked” the source is switched off, in standby, or possibly, paused.

**Selecting the USB input:** Refer to Pages 11-19.

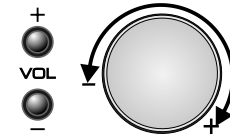
**Notes:** To optimise the upsampling circuits in the M-DAC pass digital signals to the M-DAC *without* any DSP processing or resampling at source.

If there is a digital volume control on the source unit, set it to maximum and alter the level via the M-DAC to preserve optimum performance. Consult the user manual on your source unit for advice if in doubt.

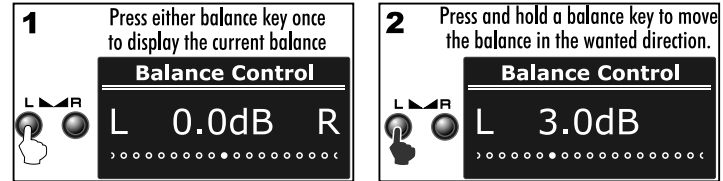
## Altering the Volume Level

Press the Volume +/- keys or rotate the Control knob to alter the level.

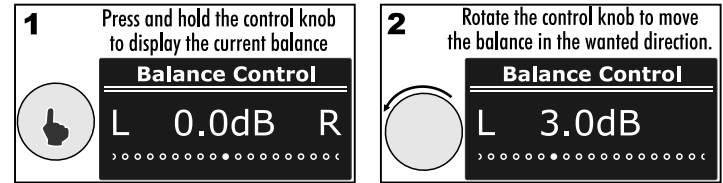
The range is -80dB to +3dB, 0dB is 2.0V (nom).



## Altering the Balance from the Handset



## Altering the Balance from the Front Panel



When the balance display is on-screen, a short press on the control knob will restore a central balance point.

## Muting the Volume

Briefly press the MUTE key or control knob to mute/unmute the output.

Press and **hold** to attenuate the level by 10dB.



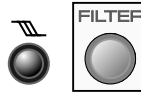
Altering the volume or switching on/off will bring the M-DAC out of mute.



## Digital Filters

The Audiolab M-DAC offers you a wide choice of filters to enhance your listening experience

Press the FILTER key on the handset or the front panel once to briefly display the current filter. Press the key again to cycle through the filters.

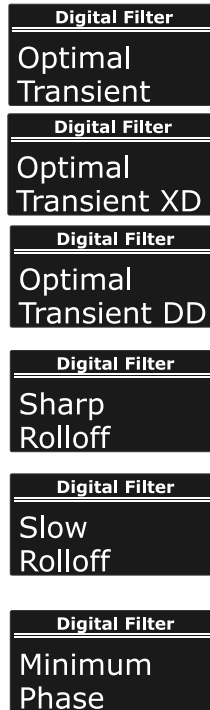


“Optimal Transient” filters exhibit no ringing - the transient nature of the music is preserved. Although exhibiting poorer performance in technical measurements, sound from this type of filter has a purity and “naturalness” that more than compensates for the lack of technical specifications. There are three Optimal Transient Filters. They exhibit identical frequency and time domain response but the internal structure of the filters varies, resulting in small but perceptibly different sonic nuances.

The “Sharp Rolloff” filter typifies industrial standard characteristics (-6dB at 1/2 Fs with significant time-domain ringing) and is included here for comparison purposes .

The “Slow Rolloff” filter starts rolling off at a lower frequency than the Sharp Rolloff filter but has a gentle rate of attenuation and significantly less “time-domain ringing”.

The “Minimum Phase” filter has a gentle attenuation slope similar to the Slow Rolloff option, however it exhibits no pre-ringing in the time domain. It can be likened to an analogue filter applied in the digital domain.



The “Optimal Spectrum” filter is a digital filter which implements sampling theory and is designed for near perfect technical response in the frequency domain. This filter also has time-domain pre-ringing which can lead to listener fatigue.

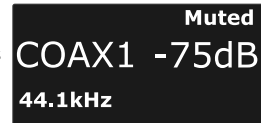


## Footnotes on the Display

The M-DAC provides a true reading of the digital input frequency. For example when a stable 44.1kHz input is present you may see the display vary between 44.100k and 44.101k. This indicates an error of 1Hz in 44,100 Hz and is insignificant. A less stable source may vary more. This option may be disabled in the menu if you prefer.



When the M-DAC is muted the display always shows the nominal value.



The menu enables you to customise the unit and optimise the interface with other equipment in your system.

### Navigating the Menu from the handset:

- Press **MENU** to enter the Menu
- Press the **◀◀/▶▶** buttons to select a Menu item

The top line displays the menu item.

The lower line displays the current parameter.

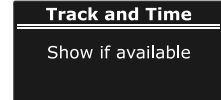
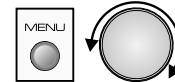
### To change a parameter:

- Select a Menu item. Press the **▶▶** button
- The parameter will be displayed in bold type
- Press the **◀◀/▶▶** buttons to change a parameter.
- Press **■** or **MENU** button to exit Menu mode.

**If no key is pressed:** after 5 seconds the unit will exit the menu.

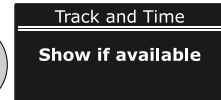
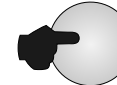
### Navigating the Menu from the front panel:

- Press **MENU**
- Rotate the Control knob to select a Menu item.



### To change a menu parameter:

- Select a Menu item.
- Press the Control knob.
- Rotate the Control knob to select a parameter.
- Press the **MENU** button to exit Menu mode,

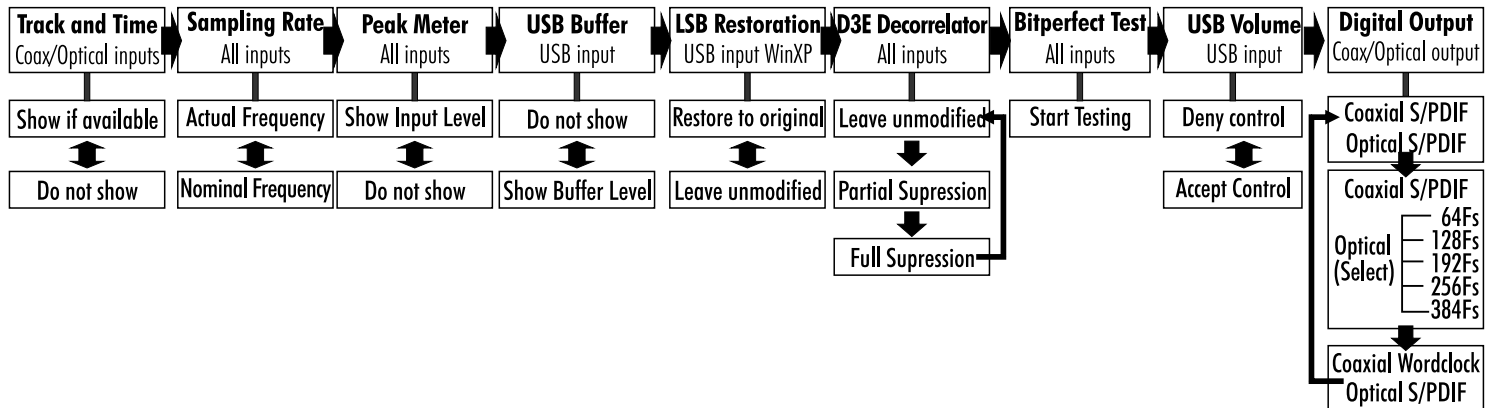


**If no key is pressed:** after 5 seconds the unit will exit the menu.

**In the following pages the full procedure for navigation via the remote handset only is detailed.**

## The Menu Tree

The chart shows the menu options. Main menu items are at the top. The next level shows the default settings. The lower levels are alternative options

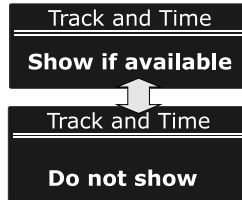


# 8: Setting up the M-DAC

## Track and Time

If you are using the M-DAC with a CD/DVD player you can display /hide track and time information (if available).

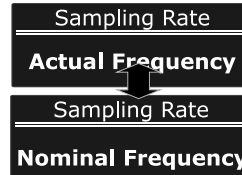
- Enter MENU mode.
- Select **Track and Time** with the **◀▶** keys
- Press **▶** to enter the menu.
- Press **◀▶** to alter the settings.



## Sampling Rate

By default the M-DAC displays the actual sampling rate of the input. If you prefer you can display the nominal sampling frequency.

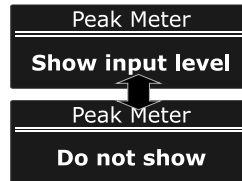
- Enter MENU mode.
- Select **Sampling Rate** with the **◀▶** keys
- Press **▶** to enter the menu.
- Press **◀▶** to alter the settings.



## Peak Meter

You can choose to view or suppress the input peak level meter.

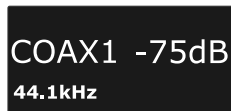
- Enter MENU mode.
- Select **Peak Meter** with the **◀▶** keys
- Press **▶** to enter the menu.
- Press **◀▶** to alter the settings.



Actual Frequency

Nominal Frequency  
Peak Meter disabled

Actual Frequency  
Track/Time Disabled



**USB Buffer: Lsb Restoration: USB Volume:** These relate to the USB connection (refer to Page 20)

**Bitperfect Test:** Refer to Page 20 for instructions on carrying out the test.

## D3E Decorrelator (Digital Data Decorrelation Engine)

The D3E engine decorrelates fixed patterns within the data stream replacing them with data based on a probabilistic model. Data decorrelation reduces both Digital and Analogue second order effects within the DAC.

- Enter MENU mode.
- Select **D3E Decorrelator**
- Press **◀▶** to alter the settings.

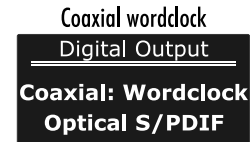
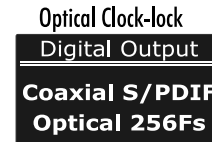
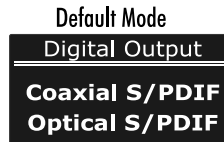


## Digital Output

By default the optical and coaxial outputs are set to S/PDIF. In this mode the M-DAC outputs a re-clocked "jitter attenuated" signal to an external DAC.

You can configure either output as a "jitter attenuated" Clock-Locked connection with compatible CD transports and other devices. To do this you should refer to the user manuals of the actual equipment. In particular, if you are connecting to a CD transport via the optical connection you will need to match the output rate of the M-DAC to the transport.

- Enter MENU mode.
- Select **Digital Output**
- Press **◀▶** to alter the settings.



## 9: The USB input: Using the M-DAC with a PC

Page 10

### Installation - Windows XP (SP2 or above)

Use a fully certified USB 2.0 cable with a maximum length of 5 metres. Never use USB extension cables.

Switch the PC on and let it boot up.

Plug the USB cable into the M-DAC and the computer and then switch the M-DAC on. The unit software will now interface with the computer and the drivers will automatically load. This process is automatic and normally needs no user intervention. The M-DAC input does not have to be set to USB during this process. Please have your Windows Installation Disc available if prompted.

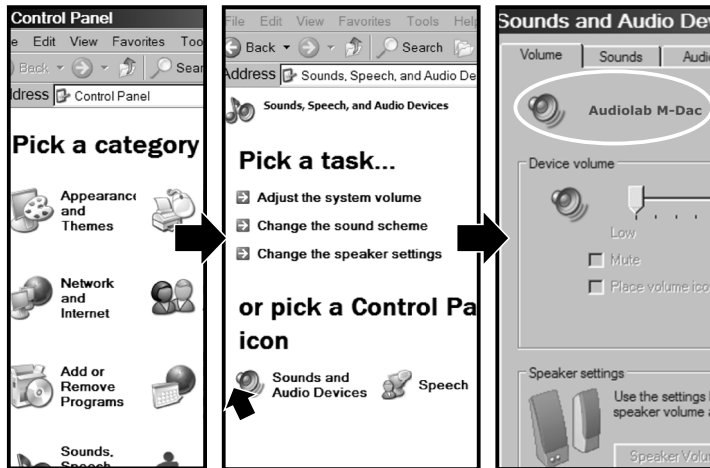
### To check that the PC has recognised the M-DAC:

Navigate to "Control Panel"

Click on "Sounds, Speech and Audio Devices"

In the next screen click on "Sounds and Audio Devices"

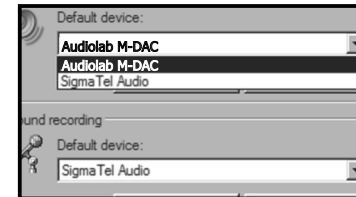
Confirm that "Audiolab M-DAC" is the default device.



### If the M-DAC is not selected as the default device:

Click on the "Audio" tab,

Select "Audiolab M-DAC" from the list. Click OK.



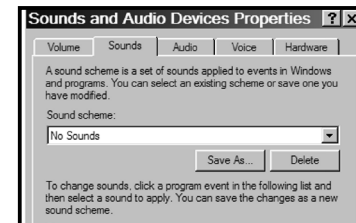
### Disabling Windows sounds

If you are listening to the M-DAC while working at your PC you can suppress most of the Windows sound effects:

Click the "Sounds" tab.

In the next screen, select "No Sounds". Click "OK" to confirm.

- **The device is "Plug and Play":** When you disconnect or switch off the M-DAC the default sound device in your PC will automatically be re-selected.
- If you disconnect the M-DAC remember to deselect "No Sounds" in your Windows Sound scheme to restore the Windows sound effects.



# 9: The USB input: Using the M-DAC with a PC - 2

## Installation - Windows Vista/Windows 7

Use a fully certified USB 2.0 cable i.e a maximum length of 5 metres. Never use USB extension cables.

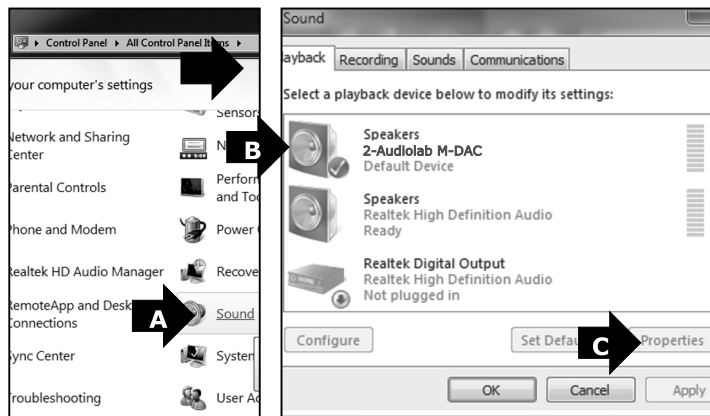
Switch the PC on and let it boot up. Plug the USB cable into the M-DAC and the computer and then switch the M-DAC on. The unit software will now interface with the computer and the drivers will load. The input does not have to be set to USB during this process. Please have your Windows Installation Disc available if prompted.

**To check that the PC has recognised the M-DAC:**

Go to **Start/control Panel/all Control Panel Items**

**A:** Click **"Sound"**. **"Audiolab M-DAC"** appears as the default device.

If **"Audiolab M-DAC"** does not appear as the default device, enable it. A green check mark appears by the default selection



**B:** In **"Sounds"**, select **"Audiolab M-DAC"**

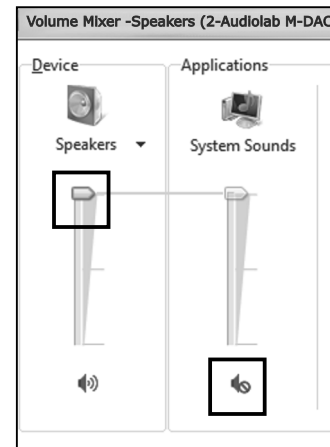
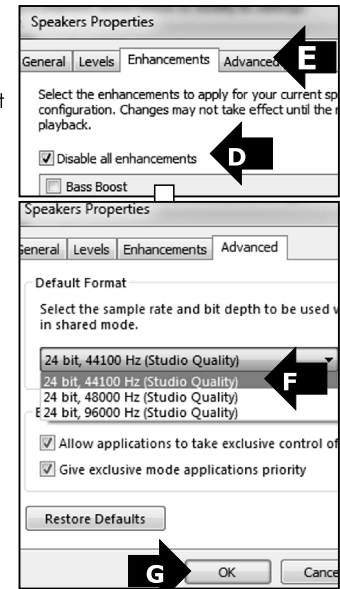
**C:** Click **Properties**

**D:** **"Disable all enhancements"** must be ticked

**E:** Click **Advanced**.

**F:** Select **"24 bit, 44,100 Hz (Studio Quality)"**

**G:** Click **OK**



Launch the **Volume Mixer** utility from the taskbar.

Set **"Speakers"** to Maximum. All levels should be controlled from the M-DAC.

Set **"System Sounds"** to mute to suppress Windows sound effects.

Setup is now complete.

## 9: The USB input: Using the M-DAC with a PC - 3

### Basic Operation

Verify that the M-DAC is selected as the default player.

Use your preferred media player.

Set a low volume level on the M-DAC (or set Mute to on).

Make sure the Volume control is at full on the media player and in the PC control panel.

Press the SEL buttons on the front panel to select the USB input.

Select the music source in the PC and commence play.

Control the volume level via the M-DAC .

Press ►► to play or

Choose a track with the ◀◀/▶▶ buttons: (press ►► if necessary)

Press ►► or ◀◀ to choose the next/previous tracks.

Press ►► to pause and restart play.

Press and hold ►► or ▶▶ to forward search.

Press and hold ◀◀ or ◀◀ to reverse search.

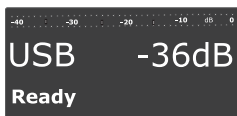
Press ■ to stop play.

*\*Functions depend on support from the chosen media player.*

Default screen - input playing



Media Player paused/stopped



No input



### Advanced Playback in Windows

Windows playback is by default not bit accurate. The most commonly used audio API is DirectSound (Windows Media Player, iTunes etc.). Audio data output using these players is passed through a “kernel mixer”.

**In Windows XP** the kernel mixer introduces a random error with a peak amplitude of +/- 1 LSB (least significant bit). By analysing the incoming data in real time, the M-DAC can detect this error signal and can restore the samples to their original state, rendering the playback bitperfect.

**In Windows Vista & 7** the kernel mixer applies a peak limiter, irreversibly changing the audio samples and the M-DAC cannot render playback. bitperfect.

**Windows Vista (SP1 and above) and Windows 7** feature WASAPI, which was created to get bit perfect data out, bypassing any internal mixers. Page 17 has details for configuring WASAPI operation in Windows 7 and Vista.

To achieve bit perfect results in Windows XP, Vista and 7 you can also use an ASIO driver and a media player that can handle ASIO streams which would be a preferred option for some.

**ASIO (Audio Stream Input/Output):** ASIO installs a direct path from input to output. A free open-source ASIO driver is ASIO4ALL downloadable here: <http://www.asio4all.com/>. Windows Media Player does not support ASIO and one needs to use a media player that will.

**Media Players:** At the time of writing, the preferred player is Foobar 2000. This is a free media player, highly configurable with ASIO and WASAPI support. This tutorial will help you get started with Foobar.

**Getting Started with Foobar 2000:** Download and install Foobar 2000: <http://www.foobar2000.org/download>.

# 9: The USB input: Using the M-DAC with a PC - 4

## Using Foobar with Windows Vista and Windows 7

Install Foobar. You will have to "allow" the installation.

Accept all the standard prompts.

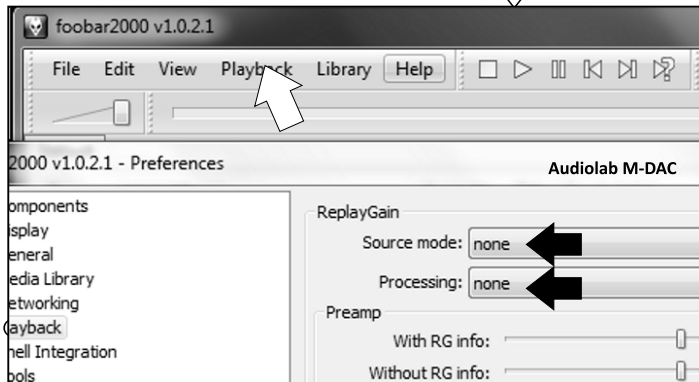
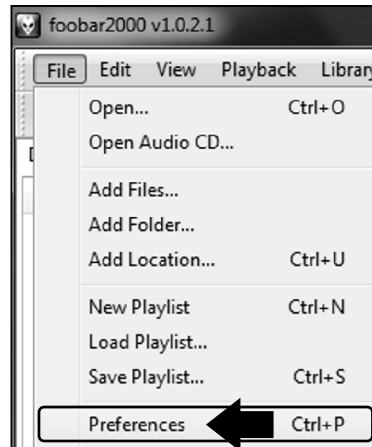
Open Foobar

Click **File/Preferences**

In the Preferences Dialogue:

Click **"Playback"**

Make sure that "Replay Gain" is set to **"None"**.

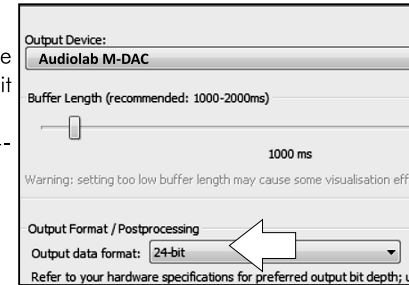


Click **"Output"**

**"Audiolab M-DAC"** should be the output device. If not, select it from the drop down menu.

Set Output Data Format to 24-bit.

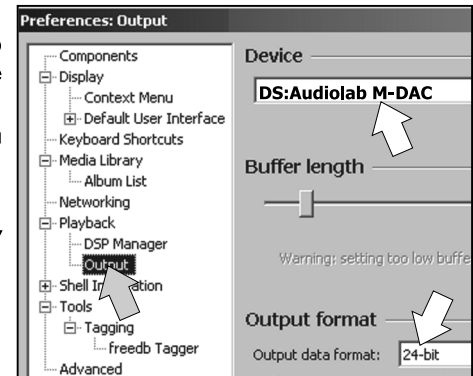
Save all the changes



**Using Foobar with Windows XP:** The procedure is the same as for Windows Vista and 7.

- Install Foobar.
- Open Foobar and click **File/Preferences**
- In the Preferences Dialogue click **"Playback"**
- Make sure that "Replay Gain" is set to **"None"**.
- Open the Playback dialogue
- Click **"Output"**
- Select **"Audiolab M-DAC"** from the drop down menu.
- Set **"Output Data Format"** to 24-bit.
- Save the changes.

**Foobar 2000 is now configured.**



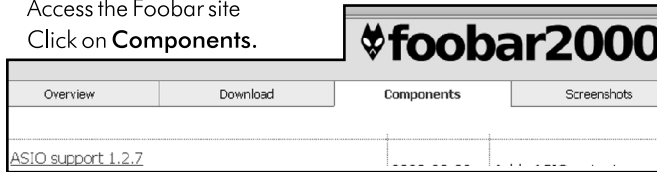
## INSTALLING ASIO SUPPORT IN FOOBAR

To install ASIO into Foobar you need two utilities:

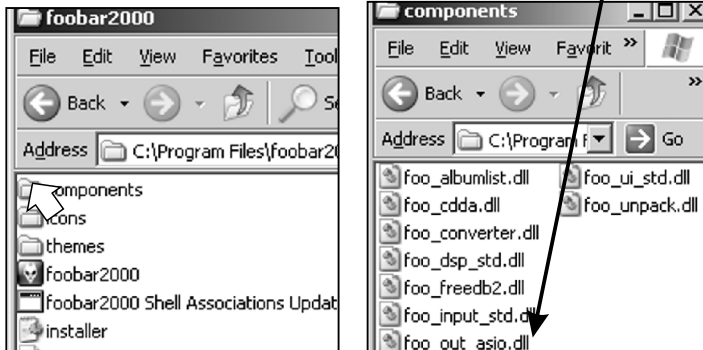
ASIO4ALL downloadable here: <http://www.asio4all.com/>.

The ASIO Plugin for Foobar downloadable from the Foobar site.

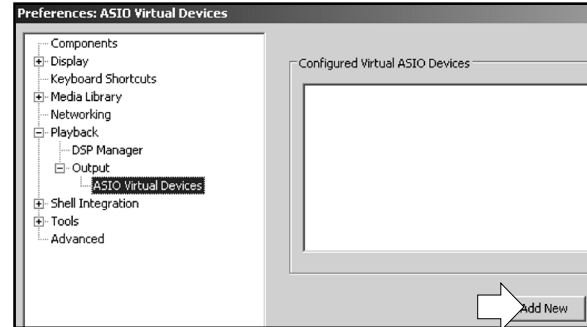
- Access the Foobar site
- Click on **Components**.



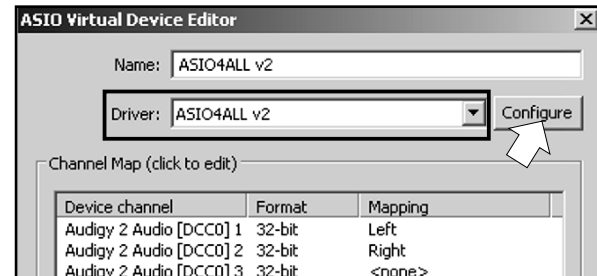
- Select **ASIO Support** from the list and click on the link.
- In the next screen click "Download". The file is zipped.
- Extract the plug-in and place it on the PC desktop.
- **Download and install ASIO4ALL**
- Make sure Foobar is closed.
- Navigate to the Foobar program folder.
- Click "Components"
- Drag the plug-in into the window. Close all windows.



- Open Foobar.
- Click File/Preferences: Select "ASIO Virtual Devices"
- Click "Add New". The program will search for devices.



*If there are no soundcards in the PC capable of ASIO operation, Foobar will find the M-DAC. If there is an ASIO capable device, Foobar may find only the installed device. You may see something like:*

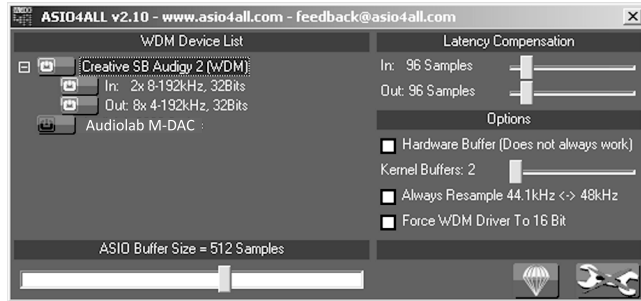


- Select ASIO4ALL as the driver.
- Click "Configure".

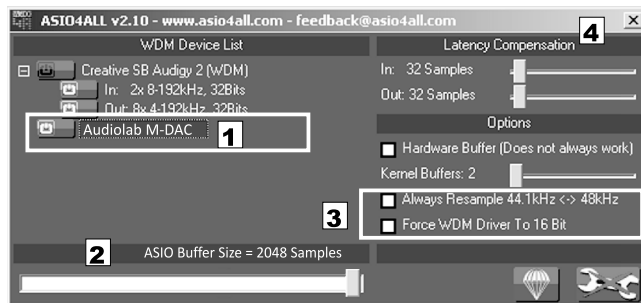


# 9: The USB input: Using the M-DAC with a PC - 6

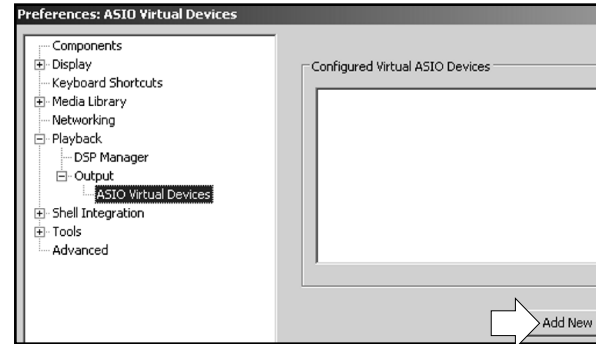
The ASIO4ALL setup screen will now deploy



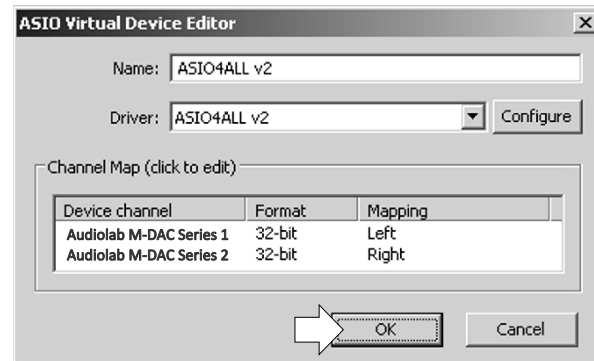
- 1: Move the highlight to "Audiolab M-DAC"
- 2: Set the ASIO Buffer Size to 2048 samples
- 3: Make sure these boxes are unchecked
- 4: Close the screen



- Click "Add New".



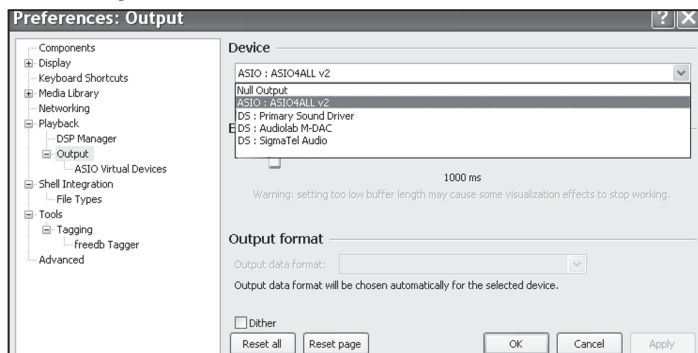
Audiolab M-DAC will appear.



- Click OK to close the screen. ASIO4ALL will now appear in the ASIO Virtual Devices box and the M-DAC will be enabled.
- Click OK to close preferences and save the new settings.

## 9: The USB input: Using the M-DAC with a PC - 7

### Final Configuration



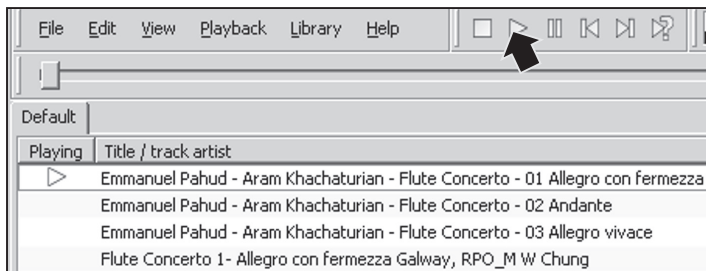
- Open Foobar. Click File/Preferences/Output
- Open "Devices". Select ASIO4ALL from the menu.

Note: If you select **DS: Audiolab M-DAC** you will use the Direct Sound (DS) kernel in Windows XP. This will not provide Bit Perfect reproduction.

### Using Foobar

- Launch Foobar
- Select the location or library that holds your audio files. Press PLAY

If all is well you will hear sound through the M-DAC.



### ASIO settings:

When Foobar is playing, you will see this shortcut (green triangle) in the Quick Launch toolbar at the bottom right of your screen.



Click the shortcut to bring up the ASIO setup screen - refer to the previous page for guidance.

### Operation

Set a low volume level on the M-DAC.

Set the Volume control at full on the media player

Press the SEL buttons to select the USB input.

Control the volume level via the M-DAC.

Press ►► to play

Press ►► or ◀◀ to choose next/previous tracks.

Press and hold ►► or ◀◀ to fast forward or reverse.

Press ►|| to pause and restart play.

Press ■ to stop play.

Default screen - input playing  
ASIO enabled.



### Disconnecting the M-DAC

If the M-DAC is permanently installed to the PC there should be no need to adjust any Foobar parameter. When the unit is disconnected from the PC you may need to re-configure Foobar to play through another connected device.

- Open Foobar. Click File/Preferences/Output
- Open "Devices".
- Select the alternative device from the list. •Click OK.

When the M-DAC is reconnected to the PC, repeat the procedure and re-enable "ASIO4ALL" or "Audiolab M-DAC" as you require.

## 9: The USB input: Using the M-DAC with a PC -10

In Windows 7 and Windows Vista, you can use ASIO or you can use WASAPI- first introduced in Windows Vista. It provides an exclusive mode that allows applications to play unaltered bitstream without passing it through the Windows mixer. It does not require installation of ASIO4ALL.

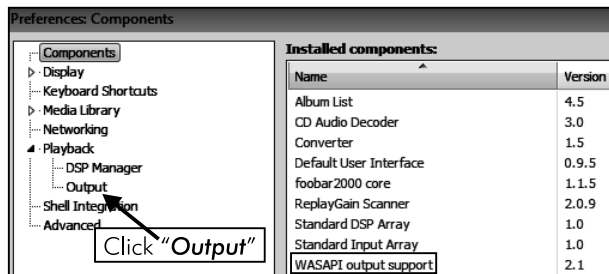
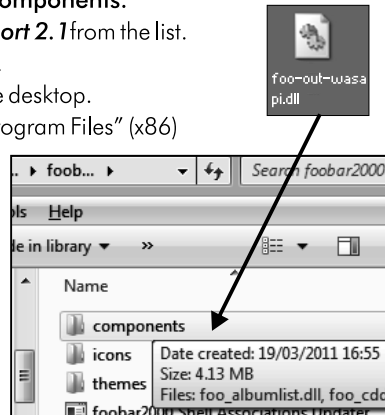
Install and configure the M-DAC as shown on Pages 10-11.

Install and configure Foobar following the instructions on Page 13.

The WASAPI Plugin for Foobar is downloadable from the Foobar site.

Access the Foobar site, click on **Components**.

- Select **WASAPI output support 2.1** from the list.
- Download and unzip the file.
- Place the WASAPI icon on the desktop.
- Navigate to "Computer"/"Program Files" (x86)
- Open "Foobar 2000"
- Drag the icon to the "components" folder
- Close all folders.
- Open Foobar.
- Click *File/Preferences*.
- "WASAPI output support" appears in the Installed Components Folder.



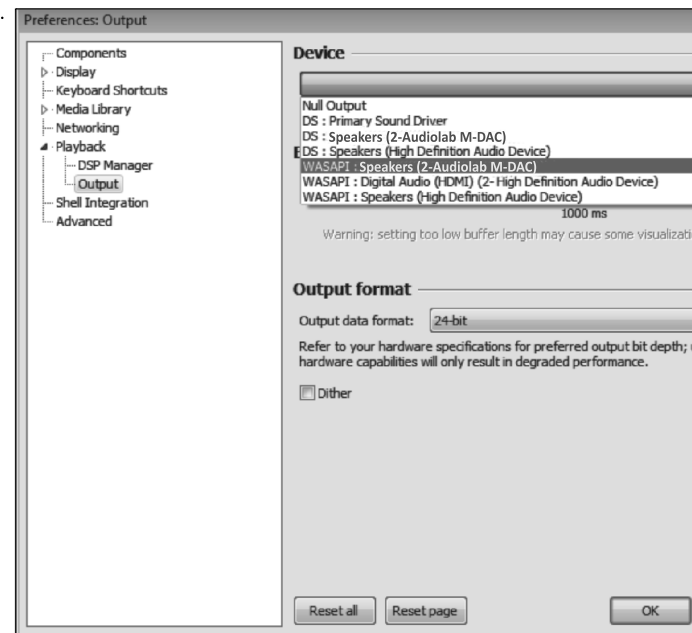
- Open "Device".

A: Select **WASAPI: Speakers (2-Audiolab M-DAC)**

B: In "Output Data Format" select **24-bit**

C: Click OK.

The system is now configured: To play your files, refer to previous pages.



# 10: The USB input: Using the M-DAC with a Mac - 1

## Introduction

Modern Macs come pre-loaded with Apple iTunes. iTunes has excellent audio characteristics, and hosts many advanced features. The Mac should ideally be OS 10.4.11 or above. The M-DAC will also interface with certain other Apple devices - refer to your user manual for guidance.

Use a fully certified USB2.0 cable. Avoid USB extension leads.

Switch the Mac on and let it boot. Plug the USB cable into the M-DAC and the Mac and then switch the M-DAC on.

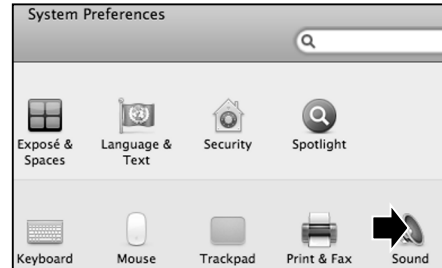
## Initialising the M-DAC

Click on the "System Preferences" icon .



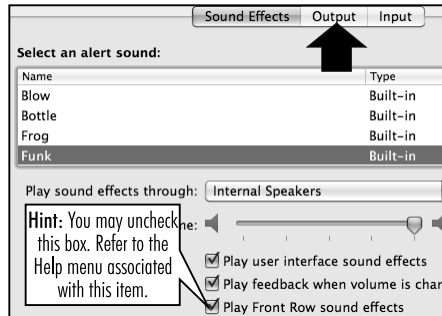
## In "System Preferences"

Click on the "Sound" icon

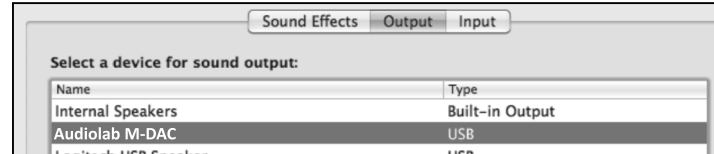


## In "Sound"

Click on the "Output" tab



In "Output": select "Audiolab M-DAC" as the device for sound output



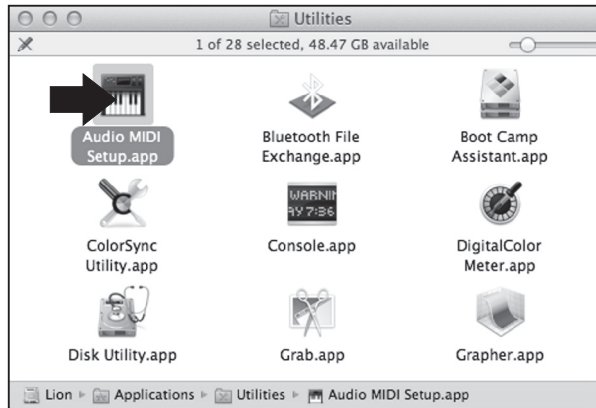
Close the window and navigate to the Desktop.

- A: Click "Finder"
- B: Click "Applications"
- C: Click "Utilities"

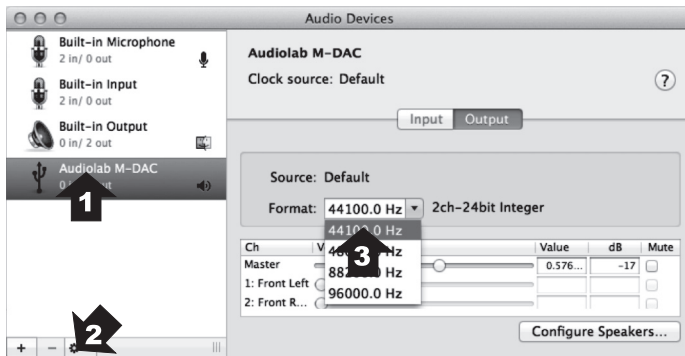


# 10: The USB input: Using the M-DAC with a Mac - 2

From the Utilities Screen: click "Audio MIDI Setup"

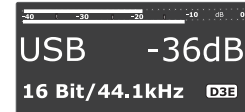


The "Audio Devices" Screen appears



Setting Up the M-DAC:

- 1: Highlight "Audiolab M-DAC" in the list.
- 2: In the pop up menu: select "Use this device for sound output"  
*Music from iTunes will be directed to the M-DAC but the alert sounds will be sent to your secondary speakers.*
- 3: Set the format to "44,100 Hz - 24bit".
- 4: Select the USB input on the M-DAC.
- 5: Start iTunes, and choose a track.



Press ►► to play or choose a track with the ►►◀◀ buttons and press ►►  
Press ►► or ◀◀ to select next/previous tracks.  
Press and hold ►►◀◀ to search forward/reverse.  
Press ►► to pause and restart play.

**Note:** The default sampling rate should be selected as 44,100 Hz 24 bit. If you are playing music at other sampling frequencies, set the sampling rate (see 3 above) to match. The bit depth should remain set at 24 bit.  
\* After changing the format, it is necessary to quit and then re-open iTunes.

**DSP Processing and Resampling:** Always pass a Digital signal to the M-DAC *without* any DSP processing or resampling at the source. This will allow the upsampling circuits in the M-DAC to work at their optimum.

**Using the M-DAC with an iPad:** OS 4.2+ supports Asynchronous USB mode via the Apple Camera Connection Kit. Older iPads should be updated to the latest version to realise the sonic benefits of this connection.

Use the USB adaptor on the kit to connect to the iPad and connect a USB cable from the adaptor to the USB port on the M-DAC to stream high resolution sound. No setup is required

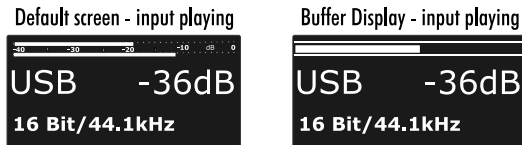
When you connect the iPad to the M-DAC, the iPad switches its sound output to the connected USB Audio device. You can now use the Play/Pause/Prev/Next keys on the Audiolab handset to control playback from the iPad.

## USB Buffer

This feature enables you to view the buffer state when streaming to the M-DAC from a USB source.

- Enter MENU mode.
- Select **USB Buffer** with the **◀◀/▶▶** keys
- Press **▶||** to enter the menu.
- Press **◀◀/▶▶** to alter the settings.

The buffer display replaces the peak meter.



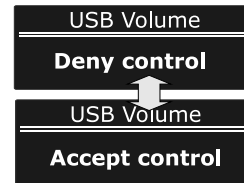
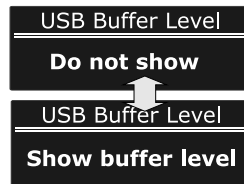
In a well adjusted system the buffer level will hover around 50%. If the buffer level is too low (underrun) or high (overrun) you should check the settings of your source equipment and media player to remedy the issue.

## USB Volume

- Enter MENU mode.
- Select **USB Volume** with the **◀◀/▶▶** keys.
- Press **▶||** to enter the menu.
- Press **◀◀/▶▶** to alter the settings.

When connecting certain units to the USB input, control of the M-DAC volume and mute can be carried out from the source unit. This function works well with Macs where changes on the M-DAC are reflected in the user interface. Windows does not support this function and will not update the system master volume if you adjust volume from the M-DAC.

By default this feature is disabled - only enable the feature if your USB source component supports the feature.



## Lsb Restoration: This utility is for use only with Windows XP systems.

The utility enables bitperfect playback in Windows XP via iTunes or Windows Media Player without the need to use media players running ASIO.

The DirectSound (DS) API (used with Windows Media Player, iTunes etc.) passes the data through a kernel mixer. In Windows XP this introduces a random error with a peak of +/- 1 LSB (least significant bit). By analysing the incoming data in real time, the M-DAC can detect the error and restore the samples to their original state, rendering the playback bitperfect.

- Enter MENU mode.
- Select **Lsb Restoration** with the **◀◀/▶▶** keys
- Press **▶||** to enter the menu.
- Press **◀◀/▶▶** to alter the settings.

"Restore to original" enables bitperfect playback



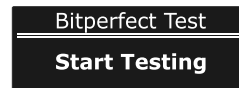
## BITPERFECT TEST - the test works on all resolutions up to 24bit/96kHz

This test can be done on all inputs.

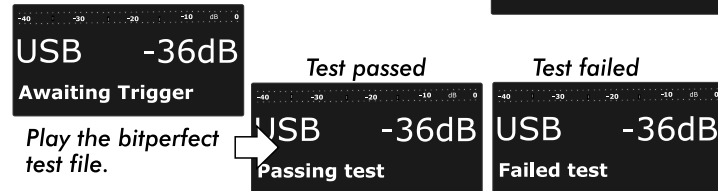
First, download the Bitperfect Test File from the Audiolab website.

1: Enter the menu and set LSB restoration to "Restore to original".

2: Select "Bitperfect Test" with the **◀◀/▶▶** keys:



3: Press **▶||** to start the test



Do not adjust the input during the test. Stopping or pausing the test invalidates the result. When the file has played, press Menu twice to exit.

If the test fails restart the procedure and replay the full file.

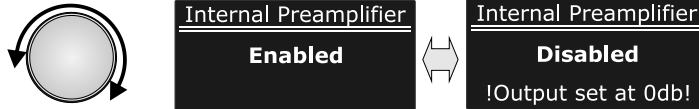
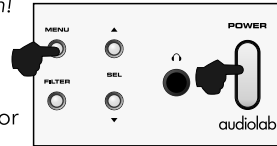
## 12: Final Adjustments

### Using the M-DAC with a pre-amplifier

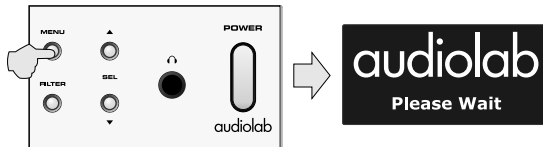
The M-DAC can be operated as a stand-alone DAC. Volume and balance functions are disabled as these are carried out from the preamplifier.

#### To set a fixed output level:

- Turn the preamplifier volume control down!
- Switch the M-DAC off.
- Hold the MENU button and switch on.
- Rotate the Control Knob to enable or disable the internal preamplifier.



- Press the MENU key (or switch off/on) to reboot.



### Notes on "Fixed Volume" mode

- 1: **Never set fixed output level if the M-DAC is connected to an amplifier without a gain control!**
- 2: Turn the preamplifier volume down **before** enabling this mode.
- 3: In this mode the output volume display and balance is unavailable.
- 4: Mute is operative.
- 5: Connecting headphones restores the volume function only to the headphone amplifier. When the headphones are disconnected, fixed volume is re-instated.

### Restoring Factory Defaults

- 1) Switch the M-DAC off.
- 2) Hold down the SEL buttons press the POWER switch.



- 3) Release the **◀◀/▶▶** buttons. Factory defaults are now restored.

## 13: Troubleshooting

*Until you are familiar with the operation of your M-DAC you may experience occasional difficulties. This guide will help you overcome the most likely issues.*

### No response/poor response to handset commands

- Is the M-DAC switched on?
- Are there fresh batteries in the handset?
- Are you pointing the handset directly at the M-DAC?
- Is the power adapter plugged in and operational?

### No sound

- Is the correct source selected?
- Is the volume turned up?
- Are all system units correctly connected and switched on?

### Sound is poor quality / distorted

- Are all cables making good connections? If necessary, switch off the power, withdraw the connector and plug it back in again, then switch on the power.

### Digital Inputs display "Unlocked"

- Check that the digital source is switched on and streaming.

### USB input displays "Inactive"

- Is the USB port correctly connected?
- The USB handshake has gone down or the computer is in Standby.
- The source device is incompatible with the M-DAC.

### I hear crackles/interference when playing a USB source

- Are you using a certified USB 2.0 interconnect, connected directly to your computer?
- A bluetooth device, a webcam, wireless devices may cause interference. Avoid sharing a USB outlet between the M-DAC and other devices and where possible, disable non-essential devices.

## 14: Care and Servicing

Page 22

### Care & Cleaning

While cleaning is in progress the AC power adaptor must be unplugged from the AC power supply socket.

Grease or dirt on the equipment may be removed with a soft, lint-free cloth slightly moistened with a mild solution of warm water and detergent or washing-up liquid. Do not use any other solutions or solvents.

If you have any queries regarding the use of Audiolab equipment, consult your dealer.

### Servicing

Servicing of Audiolab products should only be carried out by authorised service agents. If service is required the equipment should be returned, securely packaged, preferably using original packaging, to your dealer.

In the UK equipment may be returned to the IAG Service Centre address shown on this page.

Always telephone before returning any equipment.

A note should be enclosed with your name, address, telephone number, and a brief description of the reason for return.

If you require Service outside the Warranty period, do not hesitate to contact your dealer.

### Service Address

IAG Service Centre  
Unit 4, St Margaret's Way  
Stukeley Meadows Industrial Estate  
Huntingdon Cambs  
PE29 6EB

England

Tel: +44 (0)1480 452561: Fax: +44 (0)1480 413403



# 15: Specifications and Features

## Specifications

	RCA	XLR
Output Level @ 1kHz 0dB	2.25Vrms $\pm$ 0.1	4.5Vrms $\pm$ 0.1
Freq. Response, Ref. 1kHz, 20Hz - 20kHz	$\pm$ 0.2dB	$\pm$ 0.2dB
THD 1kHz, 0dB, 20Hz to 20kHz	<0.0015%	<0.0015%
Crosstalk @1kHz	>120dB	>130dB
Dynamic Range "A" wtd	=>115dB	=>121.5dB
Product Weight	4.95 kg	

## Principal Features

- 32Bit 84.000MHz 512 Element MultiBit Array DAC
- Asynchronous USB supporting 24 Bits / 96kHz with Remote Control of PC / MAC Media Player via HID support
- Two 192KHz 24Bits Coax SPDIF Digital Inputs
- Two 96KHz Optical Digital Inputs
- High Current, High Linearity RCA Single Ended & XLR True Balanced with fully discrete JFET CROSS\* Class A Output stage's
- High Current, High Linearity CROSS\* JFET Class A Headphone Amplifier
- Triple cascaded Jitter attenuation stages, with triple cascaded Asynchronous Clock domain isolation – all but eliminating the First order effects of Jitter from the external input sources on the Digital to Audio Conversion process.
- Selectable DAC Mode or Digital Pre-Amplifier Mode, allowing direct connection to Power Amplifiers and Active speakers.
- 2.7" High contrast OLED display
- "Bit Perfect" Digital Data source analyzer

- Intelligent real-time Bit Depth analysis engine – Displays the "True" Bit depth of the Digital input source
  - Digital Data Decorrelation Engine – Decorrelates the fixed "LSB's" data pattern within the Audio data stream when less than 24Bits. Data decorrelation at the DAC substrate level reduces both Digital and Analogue Second order effects within the DAC at the silicon Die level
  - MS Windows LSB Data restoration for "Bit Perfect" reply – corrects Windows' LSB rounding errors. Allows Bit Perfect "Plug and Play" with Windows Media Player
  - ASYNC USB Buffer level display to insure correct functionality and diagnostics of the USB HOST device in ASYNC Audio streaming mode
  - "Actual" or "Nominal" Sampling Frequency display – displays the TRUE input sampling frequency with 1Hz resolution
  - Digital level meters in dB with Peak hold
  - CD / DVD SPDIF subcode embedded Track and Time Display
  - Advanced De-Jittered Optical and Coax SPDIF Output, with USB to SPDIF output.
  - Selectable Optical or Coax Clock-Lock interface – allowing "Jitter Free" Clock-Locked connection with compatible CD transports etc.
  - Full Remote Control + External Remote / BUSI/O loop
  - 26 Internal regulated supply rails
  - 10 Ultra Low Noise, Low Impedance Discrete Regulators
  - 7 User Selectable Digital Filters – Software upgradeable via USB Port
  - Master Clock Jitter > 3pS Short Term - Measured directly at DAC "XOut"
  - External Power supply interface for a future upgrade path
- \*CROSS Current Regulated Output Stage Solution



Audiolab Ltd. warrants this product, subject to the terms and conditions below, to be free from defects in materials and workmanship. During the warranty period Audiolab will repair or replace (at Audiolab's option) this product, or any defective part in this product, if it is found to be defective due to faulty materials, workmanship or function. The warranty period may vary from country to country.

### Terms and conditions:

The warranty starts on the date of purchase (or the date of delivery if this is later).

You must provide proof of purchase / delivery before work can be carried out. Without this proof, any work carried out will be chargeable to you.

All work will be carried out by Audiolab or its authorised agents or distributors. Any unauthorised repair or modification will void this warranty.

If any part is no longer available it will be replaced with a functional replacement part.

Any parts that are replaced will become the property of Audiolab.

Any repair or replacement under this warranty will not extend the period of warranty.

This warranty is valid only in the country of purchase, applies only to the first purchaser and is not transferable.

### The following are not covered:

- Products on which the serial number has been removed, altered or otherwise made illegible.
- Normal wear and tear and cosmetic damage.
- Transportation or installation of the product.
- Accidental damage, faults caused by commercial use, acts of God, incorrect installation, connection or packaging, misuse, neglect or careless operation or handling of the product which is not in accordance with Audiolab's user instructions.
- Equipment that has been operated in conjunction with unsuitable,

inappropriate or faulty apparatus.

- Repairs or alterations carried out by parties other than Audiolab or its authorised agents or distributors.
- Products not purchased from an Audiolab authorised dealer.
- Products that were not new at the time of original purchase.
- Products sold 'as is', 'as seen' or 'with all faults'.

Repairs or replacements as provided under this warranty are the exclusive remedy of the consumer. Audiolab shall not be liable for any incidental or consequential damages for breach of any express or implied warranty in this product. Except to the extent prohibited by law, this warranty is exclusive and in lieu of all other warranties whatsoever, both express and implied, including, but not limited to, the warranty of merchantability and fitness for a practical purpose.

This warranty provides benefits that are additional to and do not affect your statutory rights as a consumer.

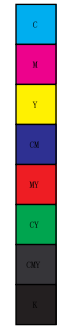
Some countries and US states do not allow the exclusion or limitation of incidental or consequential damages or implied warranties so the exclusions in the paragraph above may not apply to you. This warranty gives you specific legal rights, and you may have other statutory rights, which vary from state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

### How to claim:

To obtain warranty service contact the Audiolab authorised dealer from which you purchased this product. Do not despatch goods without the prior agreement of the dealer, Audiolab or their authorised distributors.

If asked to return products for inspection and/or repair, pack carefully, preferably in the original cartons or packaging affording an equal degree of protection, and return prepaid. If unsuitable packaging is used, Audiolab may make a charge for the supply of new packaging.

Insurance is recommended as goods are returned at owner's risk. Audiolab or their authorised distributors cannot be held liable for loss or damage in transit.



Correct disposal of this products. This marking indicates that this product should not be disposed with other household wastes throughout the EU. To prevent possible harm to the environment or human health from uncontrolled waste disposal, recycle it responsibly to promote the sustainable reuse of material resources. To return your used device, please use the return and collection systems or contact the retailer where the product was purchased. They can take this product for environmental safe recycling.



The logo for audiolab, featuring the word "audiolab" in a lowercase, white, sans-serif font.

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