Owner's Manual

ZODIAC
Gold

ZODIAC Gold
384kHz DAC

Owner's Manual

Contents

1. Safety Notes

To reduce the risk of electrical shocks, fire, and related hazards:

- Do not remove screws, cover, or cabinet. There are no user serviceable parts inside. Refer servicing to qualified service personnel.

- Do not expose this device to rain, moisture or spillover of liquid of any kind.

- Should any form of liquid or a foreign object enter the device, do not use it. Switch off the device and then unplug it from the power source. Do not operate the device again until the foreign object is removed or the liquid has completely dried and its residues fully cleaned up. If in doubt, please consult the manufacturer.

- Do not handle the power cables with wet hands!

- Make sure the device is switched off when plugging/unplugging it to/from the power source.

- Avoid placing things on the cabinet or using the device in a narrow and poorly ventilated place which could affect its operation or the operation of other closely located components.

- If anything goes wrong, turn off the device first and then unplug the power. Do not attempt to repair the device yourself: consult authorized service personnel or your dealer.

- Do not install near any heat sources such as radiators, stoves, or other apparatus (including amplifiers) that produce heat.

- Do not use harsh chemicals to clean your Unit. Clean only with specialized cleaners for electronics equipment.

- Connect all your devices before powering your Unit.

2. Introduction

Congratulations! You are now the proud owner of the **Zodiac Gold** HD Mastering 384kHz D/A converter.

Many of the world's recording studios use Antelope clocks to improve the quality of the audio from their digital converters. This is because of the unique technologies and clocking know-how that the Antelope team has gained over many years of development to improve audio through clocking. Technologies such as Oven Control for extreme stability and 64-bit Acoustically Focused Clocking with ultra wide bandwidth algorithms are just two of the unique reasons why Antelope clocks are the choice for people who care about audio quality, whether that is small project studios or the biggest facilities working on the cream of today's music.

So, now that everyone knows about the benefits of using an Antelope clock to improve their existing digital gear, what next?

A mouth watering D/A converter with Antelope's 64-bit Oven Clock built-in!

Zodiac Gold harnesses the power of digital audio without sacrificing the warmth and fullness typically associated with analog gear. Designed to deliver bit perfect, transparent sound, Zodiac Gold is suitable for the most demanding professional studios and mastering rooms, high-end audiophile applications, including: HDTV, DVD, digital cable, music server, portable music player, digital audio workstations and desktop audio editing applications. Zodiac Gold is also perfect for the home user who simply loves to listen to music at the highest quality.

Separate A and D power supplies virtually eliminate digital cross-talk and this is further enhanced by keeping those circuits on separate boards. These boards utilize large internal ground plains, cancelling noise and voltage shifts.

The Custom designed USB controller chip streams data at **480 Mbits**, allowing audio up to 384kHz with native drivers for both Mac and PC. Dual-stage headphone driver architecture delivers smooth sound at both high and low levels.

Enjoy your music all over again with the new Zodiac Gold!

All the best,
The Antelope Team

3. Features

- Up to 384 kHz sampling rate

- Stepped relay volume attenuator for precise stereo balance (matched to 0.05 dB)

- Antelope Oven Controlled Clock with Ultra Low Jitter

- Built in 64-bit Acoustically Focused Clocking eliminates jitter from all digital inputs

- De-Jittered, re-clocked Digital Outputs: 2x AES/EBU and 2x S/PDIF

- Anti-thumping Speaker & Ear protection on power up & source change

- Stereo inputs: Balanced analog (1/4"), Unbalanced analog (RCA), Computer Data (USB), 2 optical Digital (TOSLINK), 2 coaxial - SPDIF (RCA) and AES/EBU

- Stereo analog outputs – balanced (XLR), unbalanced (RCA)

- Rear panel trim pots for calibration of balanced analog outputs

- Dual-stage headphone driver architecture for superior matching with professional headphone coils

- Large volume control for analog outputs and a separate volume control for headphones

- Mute and dim of main out levels

- Adjustable (120 Ω or 0 Ω) headphone output impedance

- Input select button easily toggles between inputs

- USB compatible with Windows 7/Vista/XP/2000 and Mac OS X without driver installation

- Word Clock Input

- Unibody remote control

- PC/MAC software control panel

- Audiophile Power Supply (optional)

- Meets FCC and CE requirements

4. Quick Start

It only takes a few moments to harness the benefits of the Zodiac Sound.
Follow these simple steps to connect Zodiac Gold to your system setup:

1. Connect to the DC power source via rear panel connector (14).

2. Connect your choice of digital input(s) and analog outputs on the rear panel.

3. If you wish to use USB as the digital input, connect the Zodiac Gold USB cable to your computer. The guest operating system will recognize the new output audio device (Zodiac Gold). You should redirect sound from the computer to your newly indicated output – Zodiac Gold.

    Mac OS:
    In your **Apple Menu**, go to **System Preferences** and choose **Sound**, Select the **Output** tab and select **Zodiac Gold** from the list.

    Windows:
    Click on your PC's *START* menu, then select:
    CONTROL PANEL / SOUNDS & AUDIO DEVICES / AUDIO and ensure that the **Zodiac Gold** is selected as default audio device.

    See more on **www.antelopeaudio.com** – support area.

4. Adjust the main volume (5) and headphones volume (7) to minimum.

5. Turn the unit on with the power button (8).

6. Play audio from your preferred digital or analog source.

7. Using source button select desired rear panel input.
    The sample rate of the input (digital inputs only) should be indicated in the status display (6), the Lock indicator (1) should light steadily and audio should be present at the Zodiac outputs.

8. If you want to control your Zodiac remotely from your computer, there is also a software control panel available for you on for MAC, PC and Linux systems! You can download it from our downloads page on the support section of our website.

5. Front Panel Explained

1. Lock light
When lit, this indicates Zodiac Gold is locked to an incoming digital signal via rear panel connectors (21), (22), (23), (24). The light will flash if there is no valid digital signal or if a media player is in stopped or paused mode when using USB.

2. Infrared receiver
Remote control unit receiver. Do not cover!

3. Word Clock light
Indicates the device is locked to the incoming Word Clock signal at rear panel BNC connector (20).
NOTE: Word Clock overrides the clock signal present in AES, S/PDIF and TOSLINK.

4. Mono light
When lit, this indicates the outputs are summed to mono.

5. Main volume
Adjusts levels for analog outputs (18), (19). The level is shown on the display (6) when adjusting, with a range of -60dB to 0dB. A click is heard as each relay engages the precision resistors.

6. Display
Multi-function display can show Sample Rate, Main Volume Level, Source Input, Headphone amplifier impedance and info concerning USB mode. See also (5), (10), (12) for related functions.

7. Headphone volume
Adjusts level of headphone amplifier to headphone outputs (13).

8. Power button
Toggles standby/operation state.

9. Power/Standby light
Indicates operational and standby modes. Dimly lit for standby and brightly lit for operational power.

10. Source button
When the display shows the sample rate, pressing this button once, briefly changes the display to show the currently selected input source (for one second).

When the display shows an input source, pressing this button once will switch to the next available input source.

> **NOTE:** Only inputs fed with valid signals appear as options. Example: If only signals on AES and TOSLINK1 inputs are present, they will be the only options available when selecting the source (together with analog input 2).

> Hint: When the display shows the sample rate, you should push this button twice in order to switch to the next available source input.

11. Mono button
Pressing the mono button activates the summed outputs to give mono on the analog and headphone outputs. The status of the mono function is indicated by the mono light (4). The mono feature is only available on digital sources.

12. Mute button
Press the button once for full mute. Press once again to restore normal volume.
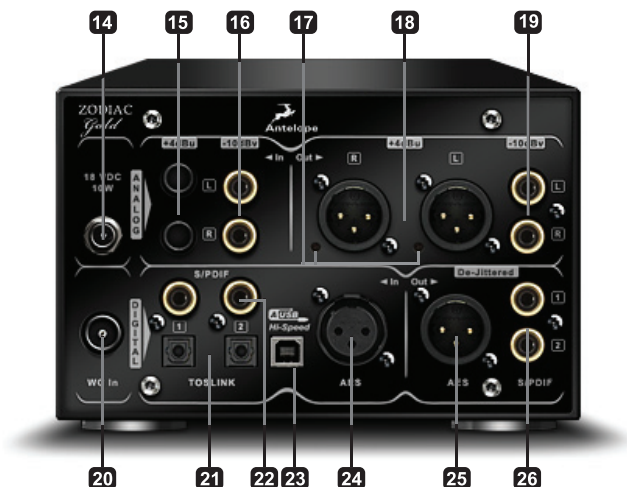Press the button and hold it for about one second to activate the -20dB attenuator. Press once to restore normal volume.

The display (6) also changes brightness when using the mute options.

13. Headphone Outputs
Universal Stereo Headphone jacks for connecting headphones for a wide range of impedances.

6. Rear Panel Explained

14. DC Power Connection
For use with Antelope's DC power supply only.

15. Balanced Analog Inputs
1/4" TRS balanced (+4dBu.) analog inputs.

16. Unbalanced Analog Inputs
RCA type unbalanced (-10dBv.) analog inputs.

17. Analog Output Trimmers
These trim pots enable precise matching of the balanced analog outputs to connected equipment. The default setting is +22dBu, with maximum level at +26dBu.

18. Balanced Analog Outputs
Balanced XLR outputs for professional use ranging from +8dBu to +26dBu. See also (17) Analog Output Trimmers.

Pin layout:
Pin 1 - Ground
Pin 2 - Hot
Pin 3 - Cold

19. Unbalanced Analog Outputs
Analog Outputs (-10dBv) using RCA type connectors.

20. Word Clock Input

BNC connector used to accept Word Clock reference.
NOTE: Word Clock overrides the Clock Signal present in AES, S/PDIF and TOSLINK.

21. TOSLINK Inputs

TOSLINK/Optical connectors for use with compatible equipment. See also (10) Source Button.

22. S/PDIF Inputs

75 Ω S/PDIF inputs for use with compatible equipment. See also (10) Source Button.

23. USB Hi-Speed

Hi Speed USB (480 Mbits). Zodiac Gold uses USB connector Type B and operates up
to 384kHz sample rate with native drivers on some operating systems.

24. AES Input

Input for compatible equipment using the 110 Ω AES/EBU connectivity standard. See also (10)
Source Button

25. AES Output

De-jittered digital output using the 110 Ω AES/EBU connectivity standard.

26. S/PDIF Outputs

De-jittered digital outputs using the 75 Ω S/PDIF connectivity standard.

7. Remote Control Unit

Zodiac Gold comes with a remote control unit. This remote control has the same buttons as those
on the front panel of the Zodiac Gold.

8. Advanced User Tips

8.1. Source input

Input sources can be switched by the source button (10).

Only digital inputs with valid signals are available for switching. (Of the analog inputs, An2 is permanently available and An1 is available once a jack is inserted, without the requirement for the signal to be present.)

Example: If only signals on AES and TOSLINK1 inputs are present, they will be the only options available when selecting the source (together with An2 as stated above).

Whenever a digital input with valid signal is selected, the display will show the selected source input name for about one second. After that, the display reverts to show the sample rate continuously.

When a digital input source is selected and its signal is lost, the Lock light will flash and the display will revert to show the name of the selected input (identifying the lost signal). Now, if you scroll through the available source inputs, the lost input source will no longer be available. You must either select a new input source, or if you re-establish the lost signal, it will be detected immediately and appear as an input source option again.

8.2. Changing USB mode and/or Headphone amplifier impedance

There are 3 available USB operation modes:

- UF1 – USB Full Speed Mode (12Mbits) for backwards compatibility. Supports sample rates up to 96KHz.

- UH1 – USB High Speed Mode (480Mbits). USB Audio Class 1.0. Sample rates up to 192KHz (default).

- UH2 – USB High Speed Mode (480Mbits). USB Audio Class 2.0. Sample rates up to 384KHz (MAC OSX and Linux only).

   NOTE: As of Dec. 2010, the only OS that supports USB Audio Class 2.0 is Mac. For more information, visit the support pages of **www.AntelopeAudio.com**.

There are 2 available Headphone amplifier impedances:

- HP1 – 120 Ω (default).

- HP2 – 0 Ω (CAUTION: boosted drive levels can damage your hearing)

Use the following procedure to change default values (FOR SAFETY, before you start, make sure that you are not wearing headphones and that volume levels are turned down as the volume levels can shift suddenly with the risk of damage to your ears and equipment):

- Switch to standby mode by pressing the power button (8). Display (6) will switch off to signify standby mode.

- Press and hold the source button (10) for 2-3 seconds. The display begins to slowly switch

back and forth between current settings for USB operation mode and Headphone amplifier impedance.

- Pushing the source button (10) will take you through the supported USB modes (UF1, UH1, UH2) or Headphone impedance (HP1 or Hp2).

- Confirm the change by pressing the power button once. The display will again start to switch between the available settings. Push the power button one more time to exit this mode and go to operating mode.

8.3. Mute

There are 2 attenuation possibilities: Full mute and -20dB attenuation (Dim- available with digital sources only).

- Full mute – Push the mute button once. A muting relay disconnects the signal from the analog outputs (18) & (19). Display fades down.

- -20dB attenuation – Push and hold the mute button for about one second. The digital signal is routed through the 20dB attenuator, thus audible both through the headphones and the outputs. Display brightness decreases slightly.

- Unmuting – When the device is in one of the above attenuator modes, pushing the mute button once restores the volume to the previous level. Display brightness returns to full illumination.

   NOTE: By default, full mute is not applied to the headphone outputs. However, it is possible to make the headphones mute as well, via options in the computer control panel.

8.4. Digital Audio Quality – factors and settings

Guidelines to improve the audio performance of your computer-based audio system:

- Keep volume controls at 100% on all operating systems

- If you are using iTunes and/or Mac OS X, set the sample-rate in the Audio MIDI applet located in the Applications / Utilities folder to match the file being played. By adding iTunes plug-ins such as Amarra and Pure Music the sample rate will be matched automatically.

- For Windows 7 or Vista, sample rates can be automatically matched using WASAPI enhanced players such as J River Media Center.

- Keep word-length settings at 24 bits. Even if you are playing 16-bit audio, it is recommended to keep 24-bit settings.

- Turn-off operating system sounds.

- Keep all operating system's DSP and plug-ins turned off. Applications, device drivers, sound cards, etc., have various DSP effects such as EQ, Bass boost, surround sound, etc.

For best performance, visit our support pages and google for many websites devoted to optimizing your computer for audio performance.

8.5. I/O connections

Proper Digital Audio cables should be used for SPDIF and AES/EBU: Avoid using standard analog audio cables for digital signal. Even though they might look the same, they are not designed for digital audio and performance will be compromised.

- AES/EBU use 110 Ω shielded twisted-pair digital cables.

- SPDIF use 75 Ω coaxial (video) cables.

8.6. Ground Loop Hum and Noise

The design of Zodiac Gold minimizes the possibility of ground loop hum and noise. However, we recommend the use of short cables and balanced connections for all the audio signals of your system. All power cables of the system should be connected to a dedicated outlet box or power conditioner unit to avoid ground current noise affecting the audio signal path. It's also advisable to keep signal and power cables separate.

9. Additional Information

Additional information regarding operating systems, audio software and media players will be updated through the support area at www.antelopeaudio.com

10. In the box

Zodiac Gold HD Mastering 384kHz D/A converter
Remote Control unit
Owner's Manual
USB cable
TOSLINK cable
Power cable
DC Power Supply

11. Technical Specifications

Dynamic Range:	129 dB
THD+N:	0.0004%
USB:	2.0 Hi-Speed. Data stream up to 480Mbits/384kHz, Type B
Clocking Generator:	4th Generation Acoustically Focused Clocking 64 bit DDS Oven Controlled Crystal Oscillator
Clock Stability:	< +/- 0.02 PPM, oven controlled at 64.5 C
Clock Ageing:	< 1 ppm per year
Sample Rates:	44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz, (352.8kHz, 384kHz through USB only)
Inputs:	BNC Word Clock: 44.1 - 384 kHz 1x AES/EBU XLR: 44.1 - 192 kHz 2x S/PDIF RCA: 44.1 - 192 kHz 2x RCA Analog: -10dBv Unbalanced (2V rms max) 2x ¼" TRS Analog: +4dBu Balanced (26 dBu max) 2x Optical TOSLINK
Outputs:	2x Analog XLR. Balanced, fully-differential drive. Trimmable 8 to 26 dBu @ 0dBFS. Preset to 22dBu. 56 Ω to GND. 1x AES/EBU De-Jittered, re-clocked Digital Output. 110 Ω. 2x S/PDIF De-Jittered, re-clocked Digital Outputs. 75 Ω. 2x Analog RCA: -10dBv Unbalanced, 2Vrms max, 56 Ω. 2x Headphones: 16 dBu @ 0dBFS. 120 or 0 Ω switchable.
Operating Temperature:	0-50°C, 32-122°F
Weight:	2.4 kg, 5.3 lb
Dimensions (Approx):	165mm (W) x 112mm (H) x 190mm (D) / 6,5" (W) x 4.4" (H) x 7,5" (D)
Power Supply:	Input: 100-240VAC. Output: 18VDC, 15W.
Remote Control Battery type:	3V Lithium Renata CR 1225

NOTES

NOTES

NOTES

Antelope
LEAP AHEAD OF THE PACK

www.AntelopeAudio.com