



Antelope OWNER'S MANUAL

ORION³²

32 CHANNEL AD/DA CONVERTER WITH AFC™ CLOCKING TECHNOLOGY



Owner's Manual

Contents

1. Safety Notes	5
2. Introduction	6
3. Features	7
4. Quick Start	8
5. Front Panel Explained	9
6. Rear Panel Explained	10
7. Software Control Panel	11
8. Advanced User Tips	18
8.1. Ground Loop Hum and Noise	18
8.2. Calibration procedure	18
9. Additional Information	18
10. In the box	19
11. Technical Specifications	19
12. Troubleshooting your Orion ³²	20

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

Thank you for purchasing the **Orion³²** from Antelope Audio.

Orion³² is a 32-channel AD/DA converter and audio master clock, supporting both MADI and USB interfaces, clocked by Antelope's renowned 64-bit Acoustically Focused Clocking (AFC) technology.

Orion³² allows up to 192 kHz I/O streaming of up to 32-channels of I/O digital audio through its custom-built USB chip. The converter also provides up to 64 channels of up to 192 kHz audio, through its Fiber Optic MADI I/O connections.

Orion³² supports ADAT protocol as well, offering up to 16 I/O channels of up to 192 kHz. The multi-channel converter inputs and outputs pass the analog signal through 8 D-SUB 25 I/O connectors.

In addition to being an extremely high quality audio converter, **Orion³²** is also an audio master clock. The four word clock outs, together with the 10 MHz input, make **Orion³²** ideally suited to be in the center of any project or high-end studio.

With its seamless digital routing options, the **Orion³²** offers extended flexibility. The device is managed through a desktop application available for both Windows and OS X. Moreover it is equipped with five preset buttons for fast and easy recall of favorite settings.

For further information, you can also visit our support area online for the FAQ, Help Desk and to register your product at: www.antelopeaudio.com.

Enjoy working with the new **Orion³²**!

All the best,
The Antelope Team

3. Features

- Antelope Audio precise AD/DA conversion technology
- 64 channels I/O Fiber Optic MADI
- 32 channels at 192 kHz I/O via custom-built USB chip
- 32 channels AD/DA
- 16 channels I/O via Fiber Optic ADAT
- 2 channels I/O via S/PDIF
- Antelope's renowned 64-bit Acoustically Focused Clocking with Atomic input
- Antelope's proprietary Oven Controlled Oscillator for supreme clocking stability
- Four word clock outputs, 1 Word Clock Input and 1 Atomic Clock Input
- Five presets for fast and easy recall of favorite setups
- 1U rack size device consuming only 20 Watts keeping the heat low
- A user friendly desktop application available for both Windows and OS X
- Low Latency Software Mixer
- Ergonomic software control panel

4. Quick Start

It only takes a few moments to harness the benefits of the Orion³² sound. Follow these simple steps to connect Orion³² to your system setup:

1. Connect to the AC power source via rear panel connector (9) and the USB cable to the USB 2.0 port on your computer.
2. Download and install the Orion³² software control panel from: <http://www.antelopeaudio.com/en/support/downloads> - This will enable you to control your device from your computer and select all necessary settings.
3. Connect your choice of inputs and outputs on the rear panel.
4. Connect your USB cable to the Orion³² and your computer. The guest operating system will recognize the new output audio device (Orion³²). You should redirect sound from the computer to your newly indicated output – Orion³².
5. If you want to use Orion³² through USB for playback or recording, please follow these instructions:

Windows:

Got to www.antelopeaudio.com and go to Support / Downloads

Download and install the Orion³² custom ASIO driver.

Click on your PC's START menu, then select:

SETTINGS / CONTROL PANEL / SOUNDS & AUDIO DEVICES / AUDIO and ensure that the Orion³² is selected as default audio device.

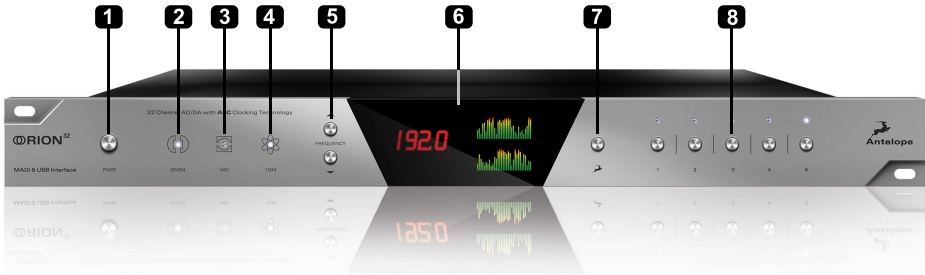
Mac OS:

Got to www.antelopeaudio.com and go to *Support / Downloads*

Here you will find the latest information on using the Orion³² for USB audio.

In your *Apple Menu*, go to *System Preferences* and choose *Sound*, Select the *Output* tab and select Orion³² from the list.

5. Front Panel Explained



1. Power button

Toggles standby/operation state.

2. Oven Clock Lock light

When lit, this indicates Orion³² is clocked by it's own internal clock.

3. Lock light

When lit, this indicates Orion³² is locked to the signal that enters through the digital inputs on the rear panel (except USB).

4. Atomic Clock Lock light

When lit, this indicates Orion³² is locked to an atomic signal that enters through the 10M input on the rear panel. This overrides the Oven Clock lock light as soon as it is plugged in and the Oven Clock lock light will automatically go off.

5. Frequency buttons

These two arrow buttons allow you to increase and decrease the sample rate, selecting from: 32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, 192kHz. The current frequency is indicated on the display (6) when adjusting.

6. Display

Multi-function display that shows Sample Rate on the left and volume levels for each individual input and output on the right. It displays 64 channels at a time that are software adjustable from the software control panel.

Note: Be aware that there might be a protective film over the display, which dims the illumination – feel free to remove it.

7. Antelope button

A multi-function button that pressed in combination with some of the preset buttons provide the following functions:

1. Antelope + Preset 1 = Restore Factory Defaults
2. Antelope + Preset 2 = Calibration Mode (needs Atomic Clock attached)
3. Antelope + Preset 3 = Displays Device Info (SN, HW rev., FW rev.)

8. Preset buttons (1-5)

Five Preset buttons store and recall your 'favorite' set-ups. For more information see page 10, section 8 (Reference to Software Control Panel).

1. Save Preset

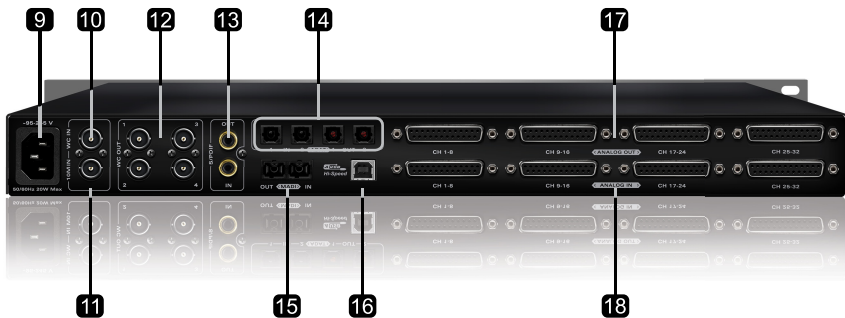
1. From Control Panel

1. Ctrl + Click on Preset Button
2. Ctrl + Number 1 to 5 from Keyboard

2. Recall Preset

1. Simply click on your choice of preset

6. Rear Panel Explained



9. Mains Power Connection

The AEC connector supports a range from ~95-245 V. This enables the device to automatically accommodate mains voltage in every country.

10. Word Clock Input

BNC connector used to accept Word Clock reference.

11. 10M Input

This BNC Input Connector allows the Orion³² to receive timing reference from an Atomic Clock such as the Antelope 10M, to increase the Oscillator accuracy. If the device is in Oven mode, plugging in the 10M causes the "Atomic LED" light to illuminate on the device front panel and the atomic device becomes the primary timing reference, thus providing better sample accuracy, more detailed sound and greater stability.

12. Word Clock Outputs

Four Word Clock Outputs with BNC connectors.

13. S/PDIF Input/Output

75 Ω S/PDIF inputs for use with compatible equipment.

14. ADAT Connectors

2 Inputs & 2 Outputs (up to 8 channels per line).

15. MADI Input/Output

1 x MADI Connector providing 64 tracks input and 64 tracks output.

16. USB High-Speed

Orion³² uses USB connector Type B and operates up to 192kHz sample rate with Antelope ASIO on Windows & Mac OS X.

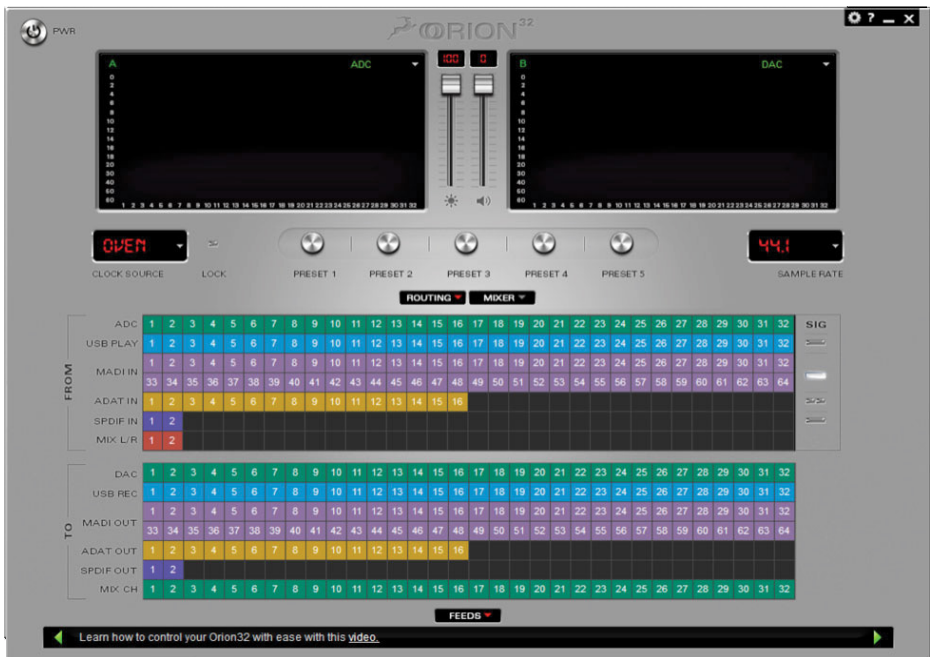
17. D-SUB 25pin Analog Outputs (on top)

Four connectors enable you to attach breakout cables, each with 8 lines.

18. D-SUB 25pin Analog Inputs (on bottom)

Four connectors enable you to attach breakout cables, each with 8 lines.

7. Software Control Panel

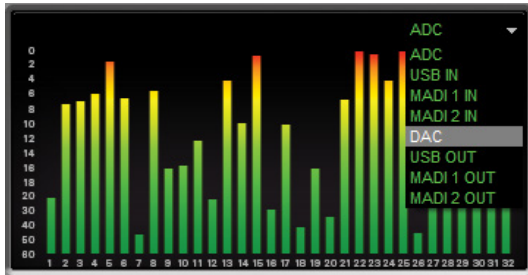


1. Power button

Toggles standby/operation state.

2. Display

Two independent precise 32-track peak meters, each with a dropdown menu from which you can select the source that you wish to be represented on the displays.



3. Display brightness control

This slider allows you to adjust brightness for the front display/peak meter of your Orion³².

4. DA volume control

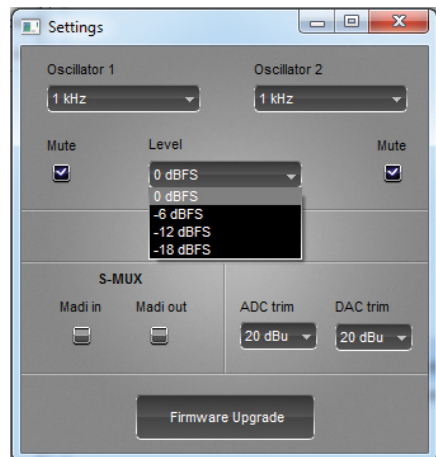
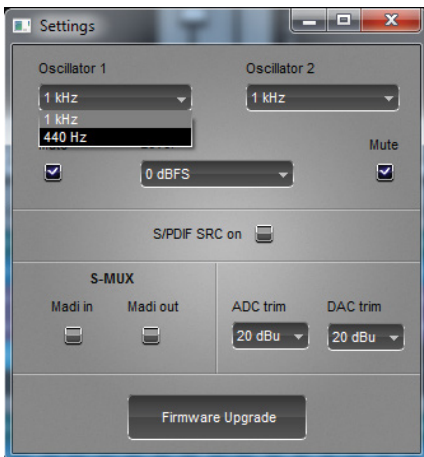
This slider enables you to simultaneously adjust the output volume level for all DA Output channels.

5. Settings & Info



Clicking on the Settings gear icon will open the Settings window.

The Orion³² features a built-in tone-oscillator for calibration. You can select two independent frequencies for each oscillator (Oscillator 1 & 2), level and mute.

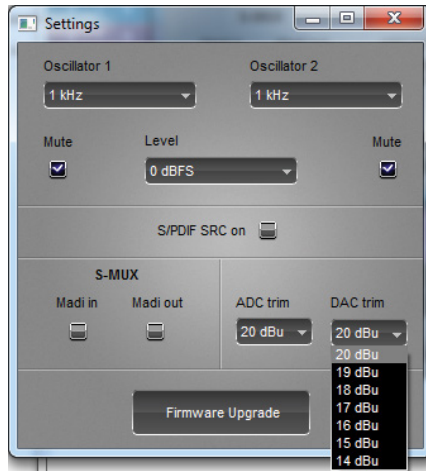


S/PDIF SRC on: By clicking on this check-box the S/PDIF input is sample rate converted to match the sample rate of the Orion³² internal clock (eg. If you want the clock to run at 192 kHz and your S/PDIF input is at 44.1 kHz, simply check this box to match the sample rate frequency of the Orion³² internal clock.

USB Channel Mode: For Mac users running above 96kHz, keep in mind that USB channels should be set to 24 due to Mac bandwidth restrictions.

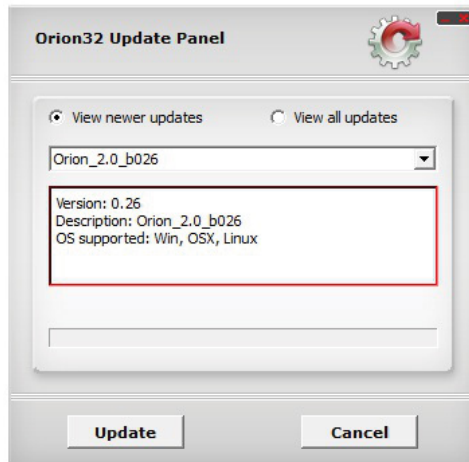
Madi in S-Mux / Madi out S-Mux: Check this box if the Orion³² is connected to a device that is outputting an S-Mux signal or if you'd like the Orion³² to output an S-Mux MADI signal.

ADC/DAC Trim: The analog Inputs and Outputs of the AD/DA converter can be finely trimmed by the options available in the drop-down menus. Settings range from 14 – 20 dBu.

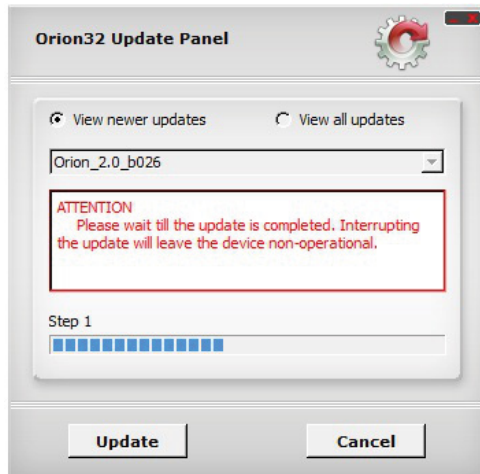


To update your firmware:

1. Open the Software Control Panel application and go to the Settings tab (gears icon on the upper right corner).
2. Click on the Firmware Update button.
3. You will be transferred to the Orion³² update panel, which will now give you the option to update the Orion³² device firmware.



4. The Orion³² device's front panel display will indicate "LOADER".
5. If there is a new firmware version you will be able to see it in the 'View newer updates'. If not, your device is up to date. (If you want to 'roll back' to a previous version of the firmware, simply click on the 'View all updates' option and select the version that you wish to 'roll back' to).
6. Click on the Update button on the bottom of the Update panel.
7. The Update Panel will start updating the device and you will be able to see the steps while the process takes place.



8. Once the Update Panel indicates that the firmware update has completed successfully, follow the instructions on the screen and please disconnect the power cable and reconnect it again. Your Orion³² will now function effectively with the latest firmware.
9. Congratulations, you have successfully updated Orion³².



The 'About' Window:

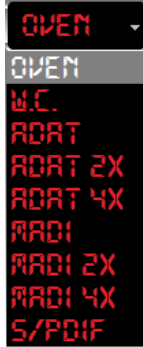
It is possible to check the current version of your software control panel by clicking on the "?" symbol at the top right-hand corner. The About window also enables you to 'Register your product', and follow us on Facebook and Twitter.



6. Clock Source

This dropdown menu allows you to select how the Orion³² is to be synchronized. Select Oven/10M for internal sync (with or without 10M atomic clock reference), W.C. (Word Clock) to sync the Orion³² to an external device through the Word clock input, or MADI, ADAT, S/PDIF for syncing with incoming digital signals.

Once 10M is connected it replaces “Oven” in the Clock Source dropdown menu:



Orion³² supports sample rates higher than 48kHz for MADI and ADAT and also supports S-Mux. The following tables show what the various options for MADI and ADAT implement in order to be consistent with the input/output of your other devices connected via MADI or ADAT.

Clock Source MADI Options (with or without the S-Mux option selected in Settings):

Clock Source Mode	MADI Configuration	
	Sample Rate	Channels
MADI	44.1 kHz	64 ch
	48 kHz	64 ch
MADI 2X	88.2 kHz	32 ch
	96 kHz	32 ch
MADI 4X	176.4 kHz	16 ch
	192 kHz	16 ch

Clock Source ADAT options: (Note that there is no S-Mux check-box for ADAT as it automatically enabled when you select ADAT 2X or ADAT 4X):

Clock Source Mode	ADAT Configuration	
	Sample Rate	Channels
ADAT	44.1 kHz	8 ch
	48 kHz	8 ch
ADAT 2X	88.2 kHz	4 ch
	96 kHz	4 ch
ADAT 4X	176.4 kHz	2 ch
	192 kHz	2 ch

7. Lock light

When lit, this indicates Orion³² is locked to an incoming signal via rear panel connectors.

8. Presets:

Five different presets are available to save your favorite setups for easy access. To save a new preset:

- Hold down Ctrl (PC) or Command (MAC) & mouse-click on the preset button (in the software control panel) or;
- Press Ctrl (PC) or Command (MAC) & press the according number on your keyboard.

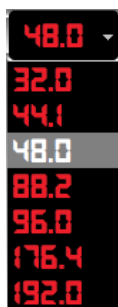


You can reset the presets to the factory setting:

With the Orion³² in operating mode, press and hold the Antelope button whilst pressing Preset button 1. This will restore factory defaults settings. Now press the Antelope button to return to operating mode.

9. Sample Rate

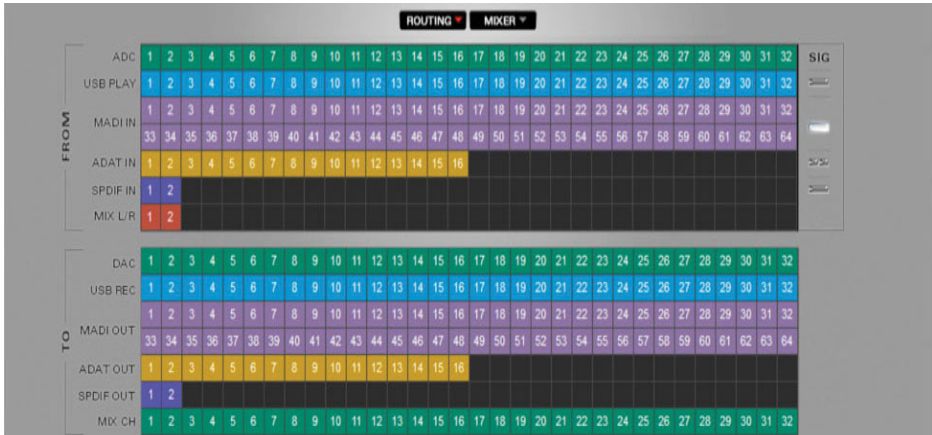
This display shows the currently selected sample rate and provides a drop-down menu from which you can select various sample rates from 32kHz up to 192kHz.



10. Routing / Mixer

Here you can select either the routing screen or the Zero Latency Mixer to be viewed on the Software Control Panel.

11. Routing Mixer



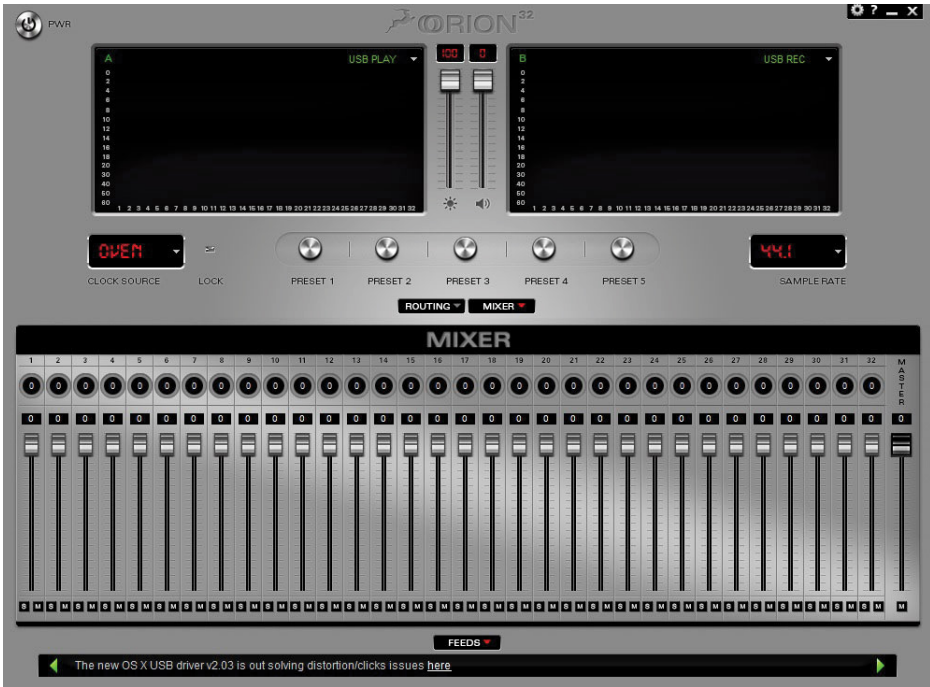
This panel enables you to select inputs and route them to your chosen outputs by simply dragging and dropping channels. Each input has its own unique color. When routing channels, the input color will be copied from whichever input you select to whichever output you select. In order to select multiple tracks hold 'Shift button' and click on the input channels, then drag and drop. Right clicking on the outputs enables you to either mute a track or output a selected frequency from a choice of two different oscillators that can be adjusted from the Settings tab.

To the right side of the Inputs & Outputs Router are 5 presence indicator lights, which indicate the presence of a valid signal detected by the Orion³².

Once you select the Clock Source and Sample Rate, this will automatically determine the number of channels available to you in the Inputs & Outputs Router.

When your Orion³² is slaved to another clock source i.e. USB, the panel will lock, displaying a "Pad Lock" symbol to the clock source and you also won't be able to change the presets. This prevents the changing of sample rates and presets for safety reasons.

12. Low Latency Mixer



The Low Latency Mixer provides near Zero Latency mix and monitoring that can be distributed using the control panel, allowing a low latency mix to be distributed from any output of the Orion³².

For example you can drag your 32 USB play channels to the “mix channels” and then the MIX L/R inputs to DAC 1 and 2, providing a stereo bus mix to DAC channels 1 and 2.

The Low Latency Mixer provides the basic functions of a real mixer such as: Solo, Mute, Pan, Volume Level controlled by faders and a Master Fader, so you can easily make a stereo mix.

Maximum Number of Channels per Sample Rate:

Sample Rate	MADI	USB	ADAT	S/PDIF
32 kHz	64 ch	32 ch	16 ch total / 8 ch per line	2 ch
44.1 kHz	64 ch	32 ch	16 ch total / 8 ch per line	2 ch
48 kHz	64 ch	32 ch	16 ch total / 8 ch per line	2 ch
88.2 kHz	32 ch	32 ch	8 ch total / 4 ch per line	2 ch
96 kHz	32 ch	32 ch	8 ch total / 4 ch per line	2 ch
176.4 kHz	16 ch	32 ch	4 ch total / 2 ch per line	2 ch
192 kHz	16 ch	32 ch	4 ch total / 2 ch per line	2 ch

8. Advanced User Tips

8.1. Ground Loop Hum and Noise

The design of Orion³² minimizes the possibility of ground loop hum and noise. However, we recommend the use of shorter, shielded 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 is also advisable to keep the layout of your signal and power cables separate.

8.2. Calibration procedure

The Orion³² can be calibrated periodically in order to calibrate the accuracy of the internal clock by connecting it to the 10M Atomic Clock. This procedure is not typically required often, but when necessary, please follow these instructions:

- Connect the 10M to Orion³² via the dedicated 10M input;
- Power on the 10M and wait until it reaches operating temperature;
- With the Orion³² in standby mode, press and hold the Antelope button whilst pressing Preset button 2;
- Leave the buttons and wait for one minute to allow the units to stabilize;
- You will see "Calibration" appear on the display along with "Heating Up" and the temperature of the Oven;
- Wait for the calibration to take place;
- When the Err. Number becomes stable, press the Preset button 2 again to end the calibration;
- You will see "DONE" displayed on the LCD screen.

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

- Orion³² Multi-Channel AD/DA Converter
- Owner's Manual
- Warranty card
- Power cable
- USB cable

11. Technical Specifications

Inputs

Analog Inputs 4 x D-SUB 25 (32 channels), +20 dBu max, 11.2 kOhms

Digital Inputs 1 x Fiber Optic MADI
2 x ADAT
1 x S/PDIF

Atomic Clock 1 x 10M Input @ 75 Ohms 1Vpp on BNC

Word Clock 1 x Input @ 75 Ohms 3Vpp on BNC 32 – 192kHz

Outputs

Analog Outputs 4 x D-SUB 25 (32 channels), +20 dBu, 56 Ohms

Digital Outputs 1 x Fiber Optic MADI
2 x ADAT
1 x S/PDIF

Word Clock 4 x Outputs @ 75 Ohms 3Vpp on BNC 32 – 192kHz

USB I/O USB 2.0 Hi-Speed; Data stream up to 480 Mb/s/192kHz,
32 channels I/O, Type B

D/A Converter

Dynamic Range 118dB

THD + N -98 dB

A/D Converter

Dynamic Range 118dB

THD + N -105 dB

Clock Specs

Clocking System 4th Generation Acoustically Focused Clocking
64-bit DDS
Oven Controlled Crystal Oscillator

Clocking Stability <+/-0.02 ppm, oven controlled at 64.5°C/ 148.1°F

Clock Aging < 1 ppm per year

Clock Calibration <+/-0.001 ppm

Atomic Clock Input 10MHz

Sample Rates (kHz) 32, 44.1, 48, 88.2, 96, 176.4, 192

Additional Information

Operating Temperature 0-50°C / 32-122°F

Weight 3 kg / 6.6 lb approx.

Dimensions (approx.) Width: 483 mm / 19"
Height: 44 mm / 1.75"
Depth: 220 mm / 8.66"

Power Supply AC Universal input ~95-245 V

Power Consumption 20 Watts Max

12. Troubleshooting your Orion³²

Start up and Sound:

Are you running the latest control panel and firmware?

If not, please update your control panel and firmware.

Are you in the correct USB mode for your operating system and sample rate? (Mac Only)

While using Macintosh Operating Systems, please be aware that you must be in 24 channel USB mode when working with sample rates above 96khz.

Are you correctly routing the audio signal via the routing panel?

For USB play back, route the USB-play channels to the DAC channel by dragging and dropping from the top section to the bottom. For more info on routing see the “Orion³² - Routing with ease” video from the Antelope Audio Youtube page.

Have you set the correct sample rates matching your DAW with your computer's sound and the Orion³²?

On Mac, first check that the sample rate is correct in the audio midi set up, then proceed to check in the DAW before finally checking the Orion³²'s sample rate.

For Windows, first check in play back devices, right click on the Orion³² then click properties before then moving to the advanced tab. Then repeat the above by checking the DAW's sample as well as the Orion³².

Connectivity:

If you believe there is no sound being received to an input or delivered from an output:

- Check your source. Is there a signal being transmitted form the source?
- Is your source in the correct sample rate for the Orion³² to receive?
- Check what clocking mode you are in. Are you receiving the clock signal from the source?
- Check that the relevant lock light on the control panel of the Orion³² is lit up.
- Try a different cable and another source if available.
- Check the routing on the control panel. Have you routed the signal path correctly?
- If you have routed signals to the routing mixer, check their corresponding fader is up.
- Check the relevant peak meters of the control panel by selecting them in the drop down menu to see if the relevant signal is being received or is being outputted.

DAW

What buffer size is your DAW set to?

If it is significantly low i.e. lower than 128 samples in your buffer size, try increasing it. Try increasing the buffer size from the Orion³² control panel (Windows Only)

Have you checked the input and output routing is correct in your DAW?

Is the Orion³² device selected in the relevant sound card section of the DAW's preferences?

If the Orion³² doesn't show up in you DAW, first try unplugging and plugging back the USB cable, then restarting your Computer and finally re-install the firmware, drivers and control panel for the Orion³².

Notes

A series of horizontal dotted lines for writing notes.

Notes

A series of horizontal dotted lines for writing notes.

Notes

A series of horizontal dotted lines for writing notes.



Antelope
OWNER'S MANUAL

ORION³²

32 CHANNEL AD/DA CONVERTER
WITH AFC™ CLOCKING TECHNOLOGY



WWW.ANTELOPEAUDIO.COM

Version 1.1 / 26.04.2013