



OWNER'S MANUAL

ORION³²⁺

 Thunderbolt™

32-CHANNEL AD/DA INTERFACE
WITH AFC™ CLOCKING TECHNOLOGY



Owner's Manual

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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.
- This unit is connected via its power cord to the mains safety earth.
- Never operate the unit without this earth connection.
- AC power supply cable should be routed so that it is not likely to be walked on or squeezed by items placed upon or against it.
- To completely turn off the device, unplug the power cable first from the outlet and then from the rear panel of the unit.
- Both, occasional and continued exposure to high sound pressure levels can cause permanent ear damage via headphones and monitors.
- Your unit should always be un-racked when traveling or in a flight case.
- The device is designed to operate in a temperate environment, with a correct Operating Temperature of:
0-50 °C, 32-122 °F

2. Introduction

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

Orion32+ is a 32-channel AD/DA converter and audio master clock, supporting Thunderbolt™, 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 Thunderbolt™ or its custom-built USB chip. The converter also provides up to 64 channels 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 two 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 multiple monitor mixers with on-board DSP effects such as EQ, compressor and reverb.

Connected with MP32, a 32-channel console-grade microphone preamp, **Orion32+** ensures a full transparency of the sound and complete integrity of the signal via the whole chain, from the mic pres through the conversion, recording and playback, all of them characterized by the signature Antelope sound.

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 Thunderbolt™ or custom-built USB chip
- 32 channels AD/DA
- 16 channels I/O via Fiber Optic ADAT
- 2 channels I/O via S/PDIF
- 1 x Monitor Out on TRS (2 channels)
- Antelope's renowned 64-bit Acoustically Focused Clocking Technology
- Antelope's proprietary Oven Controlled Oscillator for supreme clocking stability
- 2 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
- Ergonomic software control panel
- Extremely flexible routing and mixing capabilities
- Massive parallel DSP and effects processing

4. Installation Guide

Windows:

1. Connect the USB cable to the USB port on your computer.
2. Download and install the Orion32+ software control panel and drivers from www.antelopeaudio.com/en/support/downloads This will enable you to control your device from your computer and select all necessary settings.
3. Open your control panel by double clicking and follow the device activation procedure.
4. Connect your choice of inputs and outputs to Orion32+.
5. The guest operating system will recognize the new output audio device (Orion32+).
6. If you want to use Orion32+ through USB for playback and recording, open your preferred DAW and make sure the device is selected as an input and output.

Note: Make sure your device has the most recent firmware installed.

Mac OS:

! Important Note

A Mac is compatible with Orion32+ **only** if it has the Thunderbolt™ logo.

Mini DisplayPort



Thunderbolt Port



1. Connect the Thunderbolt™ cable to the Thunderbolt™ port on your computer.
2. Download and install the Orion32+ software control panel and Thunderbolt™ driver from www.antelopeaudio.com/en/support/downloads This will enable you to control your device from your computer and select all necessary settings.
3. Open your control panel by double clicking and follow the device activation procedure.
4. Connect your choice of inputs and outputs to Orion32+.
5. The guest operating system will recognize the new output audio device (Orion32+).
6. If you want to use Orion32+ through Thunderbolt™ for playback and recording, open your preferred DAW and make sure the device is selected as an input and output.

Note: Make sure your device has the most recent firmware installed. Check this by selecting the Options panel and clicking on the Firmware Update button. See picture:



5. Front Panel Explained



1. Power button

Toggles standby/operation state

Hold down the Power button to access the System Menu of the device, which allows you to access the following sub-menus:

1. Comm. Interface (allows you to choose between Auto, Thunderbolt™, USB connectivity)
2. Device Info
3. Brightness
4. Scr Save Time
5. Scr Save Style
6. Factory Reset
7. 10M Calibration

To scroll up and down, use the Frequency up/down buttons.

To enter each one of the sub-menus, press the Frequency down button.

To confirm a chosen setting, press and hold the Frequency down button.

2. Oven Clock light

When lit, this indicates Orion32+ is clocked by its 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 Thunderbolt™ and 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

Hold down the Antelope button to access the Control Menu of the device, which allows you to adjust:

1. Clock Source
2. Peak Meter
3. Monitor Trim
4. Line Out Trim
5. Line In Trim
6. SR Conversion
7. S-MUX In
8. S-MUX Out

To scroll up and down, use the Frequency up/down buttons.

To enter each one of the sub-menus, press the Frequency down button.

To confirm a chosen setting, press and hold the Frequency down button.

Note: *To Restore Factory Defaults:*

1. Unplug the power cable,
2. Hold down the Frequency Up and Down buttons, and plug the power cable back in.

8. Preset buttons (1-5)

Five Preset buttons store and recall your 'favorite' set-ups. For more information see page 14, section 8 (Reference to Software Control Panel).

1. Save Preset
 1. From Control Panel
 1. Ctrl(Win) / Cmd(Mac) + 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 and 10MX, to increase the Oscillator accuracy. If the device is in Oven mode, plugging in the atomic clock 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

Two Word Clock Outputs with BNC connector.

13. S/PDIF Input/Output

75 Ω S/PDIF connectors 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 I/O Connector providing 64 tracks input and 64 tracks output.

16. Thunderbolt™ port

Enables you to connect your Orion32+ to a Thunderbolt™ port on a Mac computer using a Thunderbolt™ cable (not included).

17. USB High-Speed

Orion32+ uses USB connector Type B and operates up to 192kHz sample rate with

Antelope ASIO on Windows & Mac OS X.

18. Monitor Outputs

A stereo pair (2 x TRS) of balanced outputs to connect a pairs of monitors.

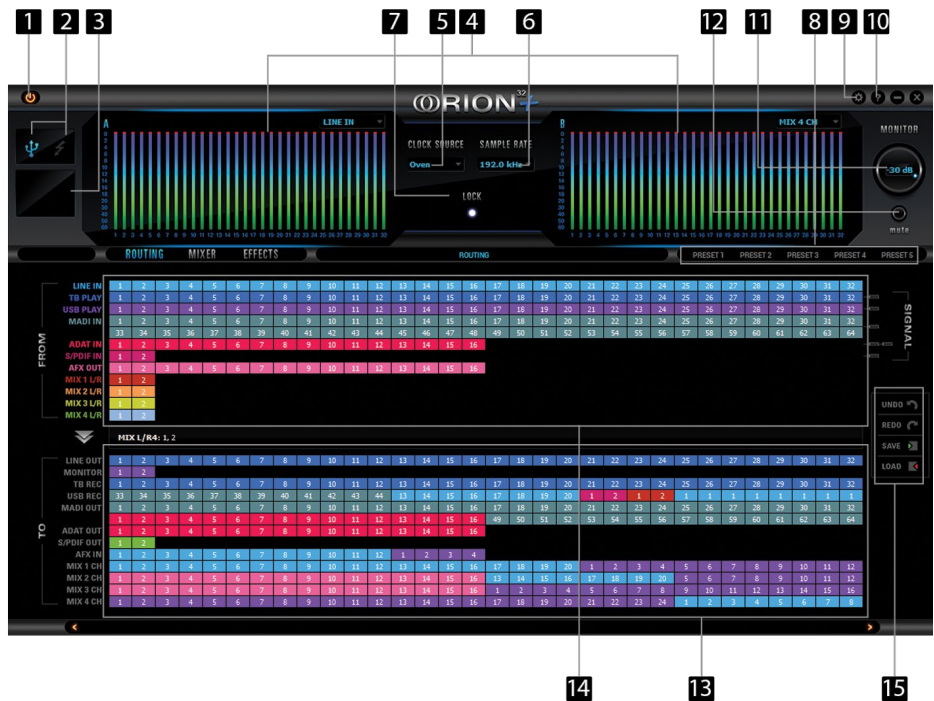
19. D-SUB 25pin Analog Outputs (on top)

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

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

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

7. Software Control Panel



7.1. Routing Tab and Main View options

The universal panel view sits constantly on the upper half of the control panel, allowing for quick access to the most important features.

Main view:

1. Power/Standby button
2. Connectivity display (indicates how your Orion32+ is connected to your computer - via Thunderbolt™ or USB)

3. 'MP32 detected' display (indicates if an MP32 unit is connected to your Orion32+)
4. Meter Source display (dropdown tab allows you to select different sources to preview)
5. 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 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 Atomic Clock 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 is automatically enabled when you select ADAT 2X or ADAT 4X):

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

6. Sample Rate select
7. Lock light
8. Presets
9. Settings and Info

10. Settings and Info

11. Mute button

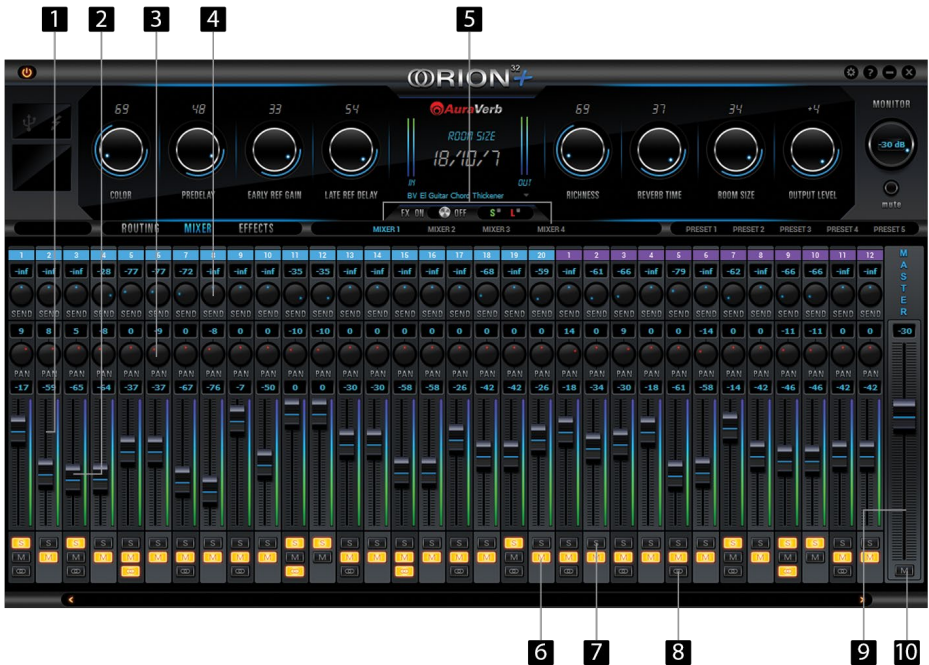
Routing Tab:

12. 'To' Section

13. 'From' Section

14. Undo/Redo Routing; Save/Load Set Up Files

7.2. Mixer Tab



1. Fader Level indication
2. Fader (double-click to reset to zero)
3. Pan
4. Send
5. Mixer 1-4 Show/Hide
6. Mute
7. Solo
8. Stereo Link
9. Master Mix Fader
10. Mute Master

Orion32+ comes with four software low latency mixers which provide near zero latency mix and monitoring that can be distributed using the control panel. The new Orion32+ allows a low latency mix to be distributed to any output.

For example, you can drag all of the thirty-two USB play channels to Mixer 1 channels and then drag and drop MIX 1 L/R to LINE OUT 1&2 providing a stereo bus mix to LINE OUT channels 1 and 2. The low latency mixers provide the basic functions of a real mixer such as: Solo, Mute, Pan, Link channels, Volume Level controlled by faders and a Master Fader, so you can easily make a stereo mix, plus an Auxiliary send in order to use the DSP effects.

Maximum Number of Channels per Sample Rate:

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



AuraVerb is a powerful and flexible algorithmic reverb effect powered by the Orion32+ that provides near zero-latency effect monitoring without taxing your computer's processor. AuraVerb can also be used as a hardware effect from your DAW, so you can take advantage of its rich and unique ambience effect while mixing or mastering.



Quick Start

AuraVerb appears as a pre-fader send effect on the Orion32+'s mixer 1. To send a signal to the reverb, turn up the send control on a mixer channel and use the reverb output level to adjust the return to the mixer's master channel. To hear the reverb, route the mixer output to your monitors by clicking and dragging MIX 1 [1] [2] to MONITOR [1] [2] on the Orion32+'s routing matrix. Fine tune the reverb mix by adjusting the balance between the dry signal on the mixer channel's fader and the reverb output level knob.

AuraVerb Parameters

- Color

AuraVerb's Color control allows you to adjust the overall tone of the reverb. On "0" the space created is darker, like a lushly carpeted area. On "100" the reverb is brightest, which can add some sizzle to a lead vocal, for example.

- **PreDelay**

PreDelay is common on most reverbs, and allows you to create a bit of space between the source and the onset of reverb by controlling the amount of delay time that precedes the initial sound from the reverb. This parameter is used to place the reverberated signal later in time with respect to the unprocessed signal. Natural settings for this are based on the size of the environment and range from 0 to 32 milliseconds. Fine adjustment of this parameter with respect to the tempo of the song or dramatic timing of the piece can help set the feel of the reverb within the mix.

- **Early Reflection Gain**

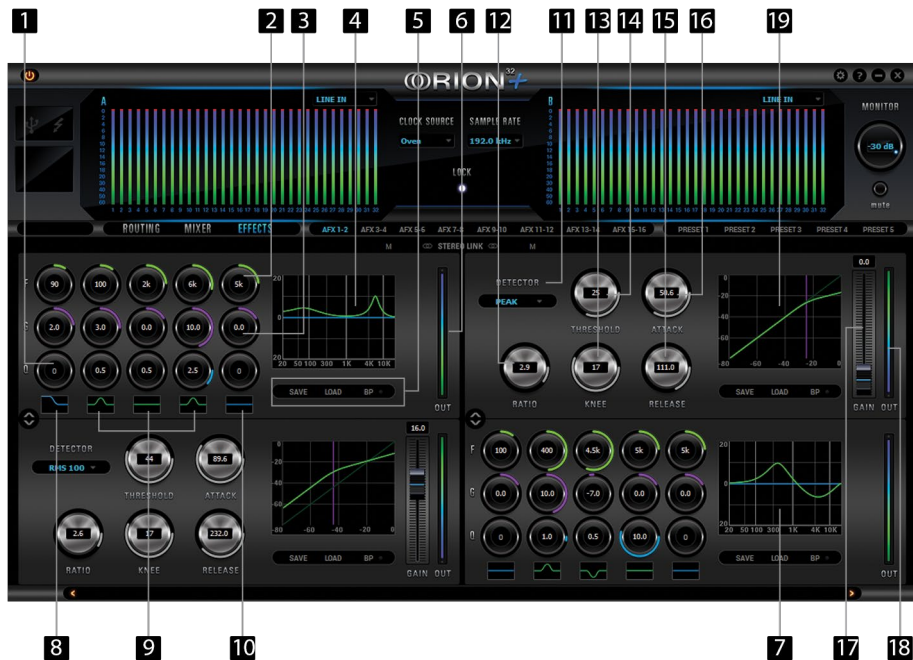
This is the linear gain value for all early reflections. These reflections are perceptually grouped with the direct sound when set at lower levels, and can nicely thicken a track when increased.

- **Late Reflection Delay**

Among other things, AuraVerb calculates reflected energy from the side walls and ceiling of the virtual space. Late Reflection Delay controls the delay of these bursts of reflections, either to create dedicated echoes or to support the spatial impression of the simulated acoustic space.

For more info about AuraVerb, visit our website:
<http://www.antelopeaudio.com/en/support/downloads>

7.3. AFX Tab



Clicking the AFX Tab reveals the 16 AFX Channel Strips:

EQ

1. Q Adjust Dials (double-click to return to default)
2. Frequency Adjust Dials (double-click to return to default)
3. Gain Adjust Dials (double-click to return to default)
- 4 & 7. Frequency Band Analysis Screen
5. Save / Load / Bypass
6. EQ Output Metering
8. Selectable High Pass or High Shelf Filter
9. Bandpass / Notch Filter
10. Selectable Low Pass or Low Shelf Filter

Compressor

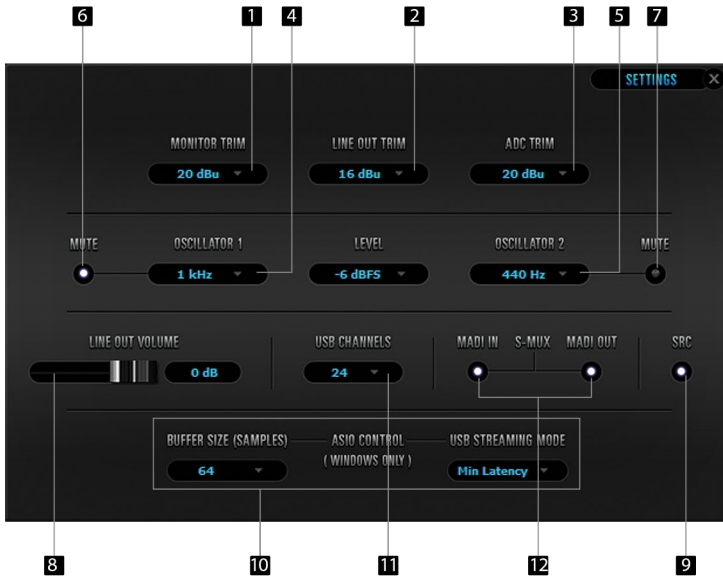
11. Detector
12. Ratio
13. Knee
14. Threshold
15. Release
16. Attack
17. Makeup Gain
18. Compression Meter
19. Compression Curve

Show or Hide 16 x DSP Channel Strips

Clicking each bar reveals or hides 2 of the total 16 DSP FX channel strips.

7.4. Options Tab

Click on the 'Settings' gear icon to open the 'Settings' window:



1. Monitor Trim
2. Line Out Trim
3. ADC Trim
- 4 & 6. Oscillator 1 and Mute
- 5 & 7. Oscillator 2 and Mute
8. Line Out Volume
9. SPDIF SRC
10. Windows, only: ASIO Control – Buffer Size & USB Streaming Mode
11. USB Channels Selector
12. MADI In S-Mux / MADI Out S-Mux

8. Advanced User Tips

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.

9. In The Box

- Orion32+ 32-channel AD/DA Interface with AFCTM Clocking Technology
- Owner's Manual
- Warranty Card
- Power cable
- USB cable

10. Troubleshooting

Start up and Sound:

- Are you running the latest control panel and firmware?

If not, please update your control panel and firmware.

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

For Thunderbolt™ or USB playback, route the Thunderbolt™ or USB-play channels to the Line Out channels 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+ 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 from 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 Thunderbolt™ cable (or the USB cable), then restarting your Computer and finally re-install the firmware, drivers and control panel for the Orion32+.

11. Technical Specifications

Inputs:

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

Digital: 1 x Fiber Optic MADI

2 x ADAT

1 x S/PDIF

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

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

Outputs:

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

2 x Monitor Outs on TRS ¼ Jacks

Digital: 1 x Fiber Optic MADI

2 x ADAT

1 x S/PDIF

Word Clock: 2 x Outputs @ 75 Ohms 3Vpp on BNC 32 - 192kHz

USB I/O:

USB 2.0 Hi-Speed; Data stream up to 480 Mbits/192kHz,

32 channels I/O, Type B

Thunderbolt™: 1 x Thunderbolt™

D/A Monitor Converter

Dynamic Range: 127 dB
THD + N: -108 dB

D/A Converter

Dynamic Range: 118 dB
THD + N: -98 dB

A/D Converter

Dynamic Range: 118 dB
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

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

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

Weight 3kg/ 6.6 lbs 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. Antelope Audio Support Resources

Antelope Audio offers a range of services and support resources for your Antelope hardware, firmware and software control panels.

FAQ

Several categories of frequently asked questions are available on the website:
<http://www.antelopeaudio.com/en/support>

Telephone Support

Phone line is for general inquiries and technical support: +1 734 418 8661
Hours of Operation: 7:00 a.m. - 3:00 p.m. (EST)

Help Desk

A ticketing system ensures a 24-hour response time:
www.antelopeaudio.com/en/support/help-desk

Live Chat

Connect with a customer support agent directly via the website:
<http://www.antelopeaudio.com/en/support>

Click on Antelope Tab on the right-hand side of the webpage
Hours of Operation: 7:00 a.m. - 3:00 p.m. (EST)

Support Documents and Software

A web resource with all device manuals, datasheets and software:
<http://www.antelopeaudio.com/en/support/downloads>

Control Panel Newsfeed

The software control panel for Orion32+ incorporates a newsfeed at the bottom, which displays all new updates and relevant information:

**You Tube Page**

Tutorial videos, interviews, user cases and promos for forthcoming products:
<http://goo.gl/yfOmZf>

Web Blog

Regular blog posts will update you on the latest user cases with the Orion32+:
<http://www.antelopeaudio.com>



***Correct Disposal of This Product
(Waste Electrical & Electronic Equipment)***

(Applicable in the European Union and other European countries with separate collection systems)

This marking shown on the product or its literature, indicates that it should not be disposed with other household wastes at the end of its working life. To prevent possible harm to the environment or human health from uncontrolled waste disposal, please separate this from other types of wastes and recycle it responsibly to promote the sustainable reuse of material resources.

Household users should contact either the retailer where they purchased this product, or their local government office, for details of where and how they can take this item for environmentally safe recycling.


Business users should contact their supplier and check the terms and conditions of the purchase contract. This product should not be mixed with other commercial wastes for disposal.



Antelope

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32-CHANNEL AD/DA INTERFACE
WITH AFC™ CLOCKING TECHNOLOGY



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