



# Orion32+ | Gen 3

## Premium 64-channel Thunderbolt(TM)/USB AD/DA Converter

### User Manual

#### 1. Safety Notes

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

Do not remove the 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 devices (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 from headphones and speakers can cause permanent ear damage.

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 choosing Antelope Audio!

Spawning three generations, the world's first 32-channel AD/DA converter just got a lot better! Orion 32+ | Gen 3 expands the unit's proven flexibility and exemplary sound quality even further, with industry-leading conversion and a major facelift. Just like its predecessors, the Orion 32+ | Gen 3 stands ready to take over studios and live shows across the globe once again!

### Key Features

- Cutting-edge AD/DA converters with up to 129dB dynamic range
- FPGA-based real-time FX models of iconic studio gear
- Compatible with AFX2DAW software bridge
- 64 channels of 24-bit, 192 kHz audio via Thunderbolt™
- Ultra-fast & stable custom Thunderbolt(TM) driver for Windows
- 32 channels of 24-bit, 192 kHz audio via USB
- MADI, ADAT, S/PDIF, 8x DB25 connectivity
- Flawless 4th Generation 64-bit clocking and jitter management
- 10 MHz input enables connection to 10M & 10MX atomic clocks
- Word Clock outputs for use as Master Clock
- Networking Control from multiple computers
- Flexible routing, mixing, and effects chaining via Windows & macOS app
- Freely movable and resizable Control Panels for multi-screen workflows
- Facelift for 2019 - gorgeous Carbon Grey faceplate

Enjoy working with the Orion32+ | Gen 3!

With compliments,  
Team Antelope

### 3. Getting Started

1. Hook up to a power source and connect the Orion32+ | Gen 3 to your Windows or Mac computer with a Thunderbolt(TM) \* or USB cable (an USB cable is included). Power on the unit.
2. Visit [www.antelopeaudio.com](http://www.antelopeaudio.com) and log in or create a customer account.
3. Head to the Antelope Audio [Customer Support](#) page and download the Antelope Launcher. Windows users must download the drivers as well.
4. Install the software by following the on-screen instructions.
5. Open the Antelope Launcher and update the Orion 32+ | Gen 3 firmware & Control Panel to the latest available version.
6. Launch the Orion 32+ | Gen 3 Control Panel from the Antelope Launcher.
7. Use the Antelope Audio Registration Wizard to register your device. Simply follow the on-screen instructions.
8. Proceed with connecting your equipment and setting up the Orion 32+ | Gen 3 for use in your preferred DAW.

*\* For more information, please visit the official Antelope Audio [Windows Thunderbolt\(TM\) driver page](#).*

### 4. Front Panel Controls



From left to right:

1. Power button

Toggles standby/operation state

Press and hold the Power button to enter the System Menu, which lets you access the following sub-menus:

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

Use the Frequency Up/Down buttons to navigate. Press the Frequency Down (?) button to enter a menu. To confirm, press and hold the Frequency Down button.

2. Oven Clock light

When lit, this indicates Orion32+ | Gen 3 is clocked by its own internal clock.

3. Lock light

When lit, this indicates Orion32+ | Gen 3 is locked to the Digital input (S/PDIF, MADI, DB25).

4. Atomic Clock Lock light

When lit, this indicates Orion32+ | Gen 3 is locked to the Antelope Audio 10M/10MX Atomic Master Clock. The Oven Clock lock light will automatically dim.

5. Frequency Up/Down buttons

Use these buttons to increase and decrease the device's sample rate. The following choices are available: 32kHz, 44.1kHz, 48kHz, 88.2kHz, 96kHz, 176.4kHz, and 192kHz.

#### 6. Display

Multi-function display \* that shows the Sample Rate on the left and individual input/output volume levels on the top and bottom meters ( up to 64 channels at a time, adjustable from the software Control Panel).

*\* There's a protective film over the display, which may dim the illumination – feel free to remove it.*

#### 7. Antelope button

Hold down the Antelope button to access the Control Menu \*, which lets you 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

Use the Frequency Up/Down buttons to navigate. Press the Frequency Down (?) button to enter a menu. To confirm, press and hold the Frequency Down button.

*\* To restore Factory Defaults:*

1. *Unplug the power cable*
2. *Press and hold the Frequency Up and Down buttons simultaneously*
3. *Plug the power cable back in.*

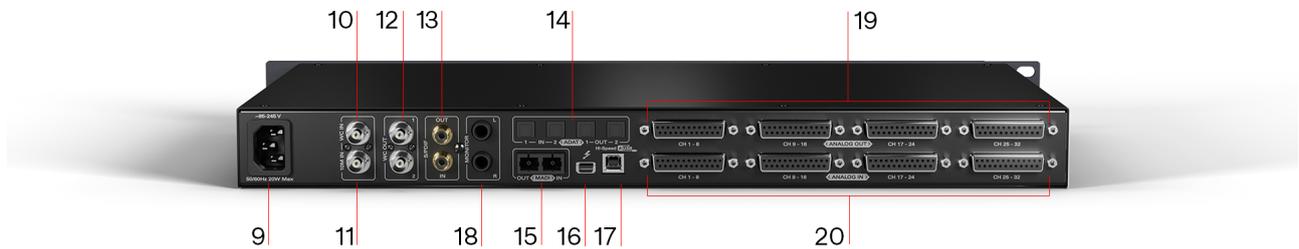
#### 8. Preset buttons (1-5)

Five Preset buttons store and recall your 'favorite' settings. The following functionality is available:

1. Save Preset
2. Recall Preset

Use the Frequency Up/Down buttons to navigate. Press the Frequency Down (?) button to enter a menu. To confirm, press and hold the Frequency Down button.

## 5. Rear Panel Explained



From left to right:

#### 9. Mains Power Connection

The IEC connector supports a range from ~95-245 V. The device automatically accommodates mains voltage in every country.

#### 10. Word Clock Input

BNC connector for Word Clock reference signal.

#### 11. 10M Input

This BNC Input Connector lets the Orion32+ | Gen 3 receive timing reference from an Antelope Audio Atomic Clock, such as the 10M and 10MX, thereby increasing oscillator accuracy, musical detail, and clock stability.

#### 12. Word Clock Outputs

Two Word Clock Outputs with BNC connector.

#### 13. S/SPDIF Input/Output

75ohm S/SPDIF connectors for use with compatible equipment.

#### 14. ADAT Connectors

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

#### 15. MAD1 Input/Output

1 x MAD1 I/O Connector, up to 64 tracks input and 64 tracks output.

#### 16. Thunderbolt™ port

Enables you to connect your Orion32+ | Gen 3 to a Thunderbolt™ port on a Mac or Windows \* computer using a Thunderbolt(™) cable (not included).

\* For more information, please visit the official Antelope Audio [Windows Thunderbolt\(TM\) driver page](#).

#### 17. USB port - Type B

Orion32+ | Gen 3 uses an USB connector Type B and operates at up to 192kHz sample rate under Windows & macOS.

#### 18. Monitor Outputs

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

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

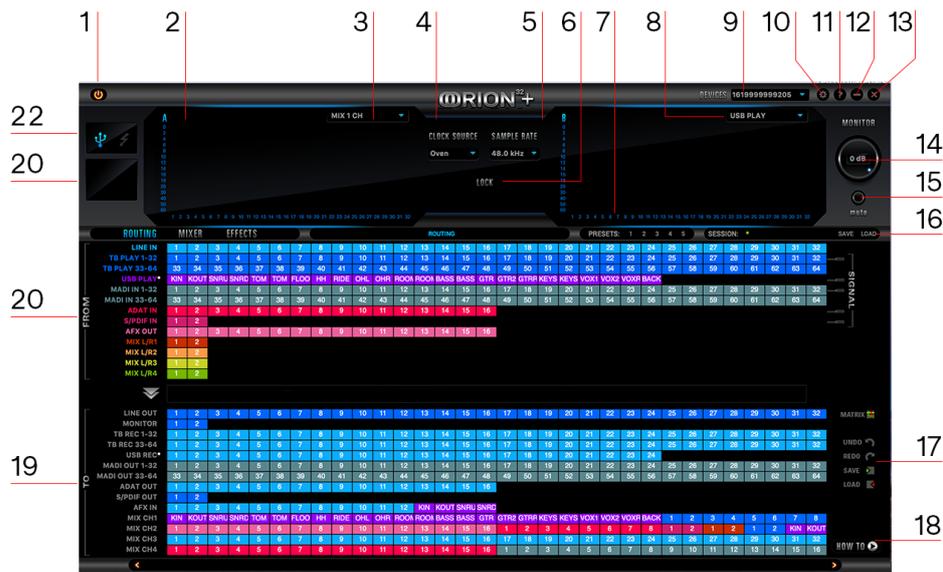
Four connectors enable you to attach breakout cables, each with 8 lines.

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

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

## 6. Software Control Panel

## 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. Levels meter
3. Meter Source display (dropdown tab allows you to select different sources to preview)

4. Clock Source

This dropdown menu lets you select how the Orion32+ | Gen 3 will be synchronized.

- Select Oven/10M for internal sync (with or without Atomic Clock \* reference)
- W.C. (Word Clock) to sync the Orion32+ | Gen 3 to an external device through the Word clock input
- MADI \*\*, ADAT, S/PDIF to sync with incoming digital signals

\* Once an Atomic Clock is connected, it replaces 'Oven' in the Clock Source dropdown menu.

\*\* Orion32+ | Gen 3 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	MADI 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

5. Sample Rate select
6. Lock light
7. Presets
8. Audio source selector
9. Device selector
10. Settings
11. Info
12. Minimize
13. Close
14. Monitor volume knob
15. Mute output
16. Sessions – manage, save, load \*

\* By saving and loading your sessions using the two buttons on the right of the control panel, you can always keep files for every song that you work on (recording, mixing, mastering).

Once you click save, you can select what you would like to save from all the settings. For example, save the Mixer settings, AFX, Digital I/O, etc.

Once you click save, you can save your session as a file on your computer. So when you load the file in the future, you can recall your session and have everything sounding exactly the same.

### **Routing Tab**

- 17. Undo/Redo Routing; Save/Load Set Up Files
- 18. How-to tutorials
- 19. Routing 'To' Section
- 20. Routing 'From' Section

### **Displays**

- 21. 'MP32 detected' display (indicates if an MP32 unit is connected to your Orion32+ | Gen 3)
- 22. Connectivity display (indicates how your Orion32+ | Gen 3 is connected to your computer - via Thunderbolt™ or USB)





## 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+ | Gen 3 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+ | Gen 3 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(TM)	USB	ADAT	S/PDIF
32kHz	64 ch	64 ch	32 ch	16 ch total / 8ch per line	2 ch
44.1kHz	64 ch	64 ch	32 ch	16 ch total / 8ch per line	2 ch
48kHz	64 ch	64 ch	32 ch	16 ch total / 8ch per line	2 ch
88.2kHz	32 ch	64 ch	32 ch	8 ch total / 4 ch per line	2 ch
96kHz	32 ch	64 ch	32 ch	8 ch total / 4 ch per line	2 ch
176.4kHz	16 ch	64 ch	32 ch	4 ch total / 2 ch per line	2 ch
192kHz	16 ch	64 ch	32 ch	4 ch total / 2 ch per line	2 ch

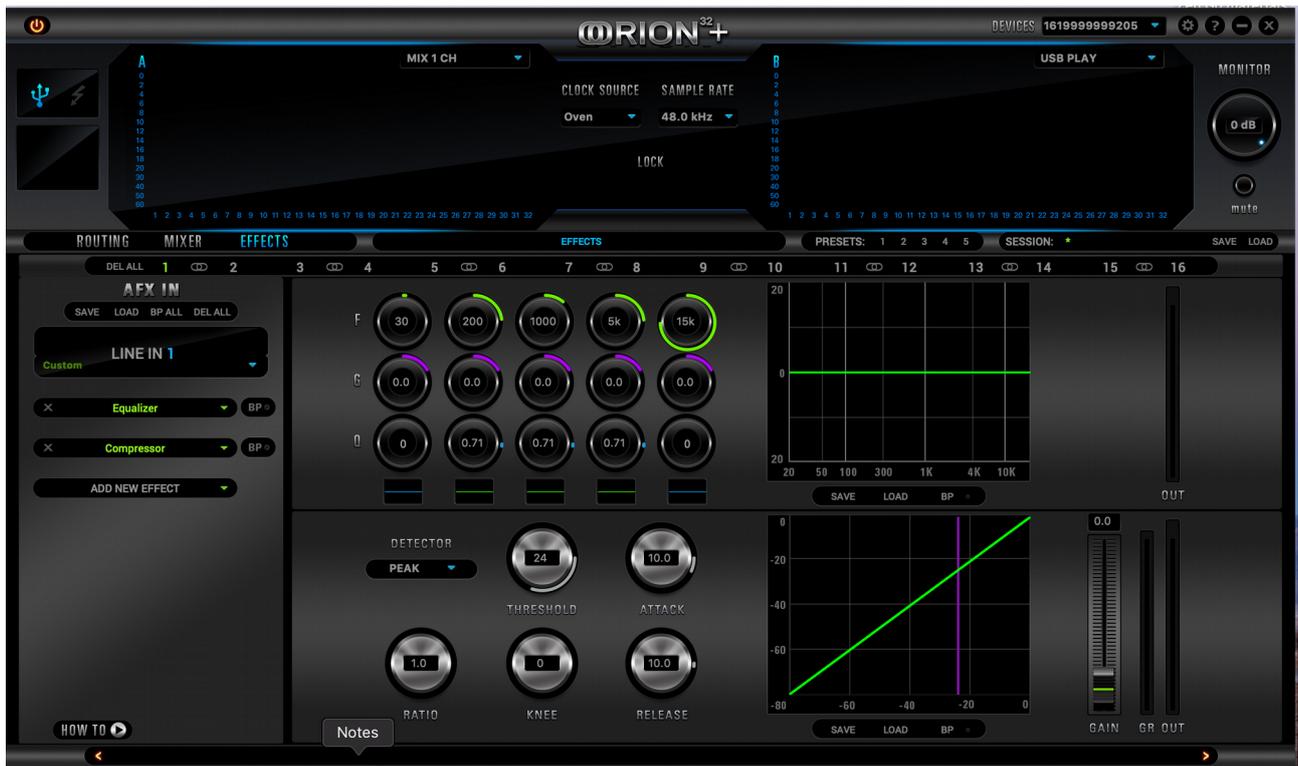
## AuraVerb



AuraVerb is a powerful and flexible algorithmic reverb effect powered by the Orion32+ | Gen 3 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.

A complete [AuraVerb User Manual](#) is available in the Antelope Audio website's Customer Support section.

## AFX Tab

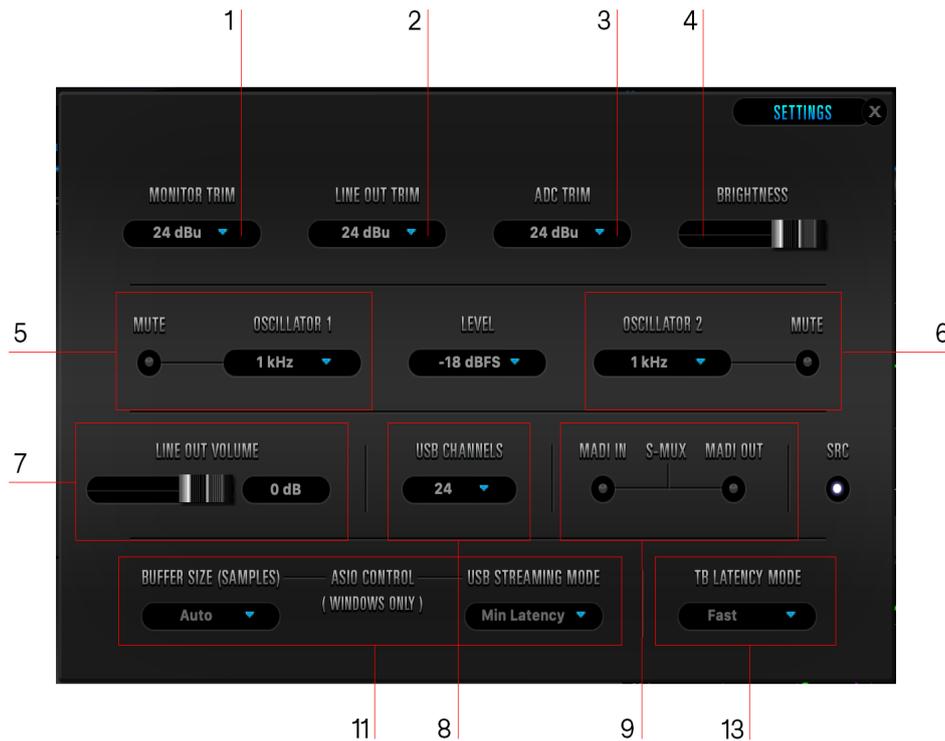


Clicking the AFX Tab reveals the 16 AFX Channel Strips. Clicking each bar reveals or hides 2 of the total 16 DSP FX channel strips. Stack effects from the drop-down menu. Drag-and-drop the effects to re-order.

User Manuals for all Antelope Audio real-time FPGA effects are available [here](#).

### Options Tab

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



1. Monitor Trim
2. Line Out Trim
3. ADC Trim
4. Screen brightness slider
5. Oscillator 1 and Mute
6. Oscillator 2 and Mute
7. Line Out Volume
8. USB Channels Selector
9. S-MUX (MADI IN / OUT)
11. Windows, only: ASIO Control – Buffer Size & USB Streaming Mode
12. USB Streaming Mode Selector
13. Thunderbolt Latency Mode Selector

## 7. Advanced User Tips

### Ground Loop Hum and Noise

The design of Orion32+ | Gen 3 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. In The Box

- Orion32+ | Gen 3 64-channel AD/DA Interface
- Warranty Card

- Power cable
- USB cable

## 9. 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.

Have you set the correct sample rates?

On Mac, first check that the sample rate is correct in the Audio & Midi Setup panel, then proceed to check in the DAW before finally checking the Orion32+ | Gen 3 sample rate.

For Windows, first check in Playback devices. Right click on the Orion32+ | Gen 3 then click Properties before moving to the Advanced tab. Then repeat the above by checking the DAW's sample rate as well as on the Orion32+ | Gen 3.

### **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+ | Gen 3 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+ | Gen 3 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.

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+ | Gen 3 Control Panel (Windows Only)

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

Is the Orion32+ | Gen 3 device selected in the relevant sound card section of the DAW's preferences?

If the Orion32+ | Gen 3 doesn't show up in your DAW, first try unplugging and plugging back the Thunderbolt™ cable (or the USB cable), then restarting your computer. Finally, reinstall the firmware, drivers and Control Panel for the Orion32+ | Gen 3.

## 10. Resources

Antelope Audio offers a full range of services and support resources for its products:

- Visit the Customer Support area at [antelopeaudio.com](http://antelopeaudio.com). We maintain some of the industry's finest Live Chat, Telephone, and ticketing support systems.
- Visit [Antelope Audio on YouTube](#) for tutorial videos, interviews, use cases and more.
- Join the [Antelope Audio Users Facebook Group](#) and reach out to fellow users.

## 11. Thunderbolt/USB Real-Time Latency Measurements (Windows 10 & macOS 10.13.6)

The tables below contain real-time latency measurements for the Orion 32+ | Gen 3 under Windows 10 and macOS 10.13.6 under Thunderbolt and USB. They were taken with the Oblique RTL Utility v0.4.11 for macOS and Windows using the following software versions:

- macOS Unified Audio Driver 3.26
- Antelope Thunderbolt Driver 1.0.4.87 (Windows 10)
- Orion32 III USB Driver 4.47.0 (Windows 10 & macOS)

### Windows 10

Line Out <-> Line In TB		
Sample Rate	Buffer Size	Latency (milliseconds)
192kHz	64 samples	0.904ms
96kHz	32 samples	0.973ms
48kHz	16 samples	1.168ms

Mon Out <-> Line In TB		
Sample Rate	Buffer Size	Latency (milliseconds)
192kHz	64 samples	1.155ms
96kHz	32 samples	1.476ms
48kHz	16 samples	2.165ms

<b>Line Out &lt;-&gt; Line In USB</b>		
<b>Sample Rate</b>	<b>Buffer Size</b>	<b>Latency (milliseconds)</b>
192kHz	64 samples	3.887ms
96kHz	32 samples	4.201ms
48kHz	16 samples	4.365ms

<b>Mon Out &lt;-&gt; Line In USB</b>		
<b>Sample Rate</b>	<b>Buffer Size</b>	<b>Latency (milliseconds)</b>
192kHz	64 samples	4.121ms
96kHz	32 samples	4.684ms
48kHz	16 samples	5.361ms

## **MacOS 10.13.6**

<b>Line Out &lt;-&gt; Line In TB</b>		
<b>Sample Rate</b>	<b>Buffer Size</b>	<b>Latency (milliseconds)</b>
192kHz	64 samples	1.0ms
96kHz	32 samples	1.1ms
48kHz	16 samples	1.3ms

<b>Mon Out &lt;-&gt; Line In TB</b>		
<b>Sample Rate</b>	<b>Buffer Size</b>	<b>Latency (milliseconds)</b>
192kHz	64 samples	1.2ms
96kHz	32 samples	1.6ms
48kHz	16 samples	2.1ms

<b>Line Out &lt;-&gt; Line In USB</b>		
<b>Sample Rate</b>	<b>Buffer Size</b>	<b>Latency (milliseconds)</b>
192kHz	64 samples	4.5ms
96kHz	32 samples	4.8ms
48kHz	16 samples	5.0ms

<b>Mon Out &lt;-&gt; Line In USB</b>		
<b>Sample Rate</b>	<b>Buffer Size</b>	<b>Latency (milliseconds)</b>
192kHz	64 samples	4.7ms
96kHz	32 samples	5.3ms
48kHz	16 samples	5.7ms