

# apollo | solo

**Thunderbolt 3-Powered Audio Interface**



## **Apollo Solo Manual**



**UAD Software Version 9**

Manual Version 200729



UNIVERSAL AUDIO

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# A Letter from Bill Putnam Jr.

Thank you for choosing the Apollo Solo Thunderbolt 3 Audio Interface as part of your music making experience. We know that any new piece of gear requires an investment of time and money — and our goal is to make your investment pay off.

Universal Audio's family of audio interfaces represent the best examples of what UA has stood for over its long history; from its original founding in the 1950s by my father, to our current vision of delivering the best of both analog and digital audio technologies.

Starting with its high-quality analog I/O, Apollo Solo's superior sonic performance serves as its foundation. This is just the beginning however, as Apollo Solo is the only bus-powered Thunderbolt 3 audio interface that allows you to run UAD plug-ins in real time. Want to monitor yourself through a Neve® channel strip while tracking bass through a classic Fairchild or LA-2A compressor? Or track vocals through a Studer® tape machine with some Lexicon® reverb?\* With our growing library of more than 100 UAD plug-ins, the choices are limitless.

At UA, we are dedicated to the idea that technology should serve the creative process — not be a barrier. These are the very ideals my father embodied as he invented audio equipment. We believe Apollo Solo will earn its way into your creative workflow by providing stunning fidelity and rock-solid reliability for years to come.

Please feel free to reach out to us via our website [www.uaudio.com](http://www.uaudio.com), and via our social media channels. We look forward to hearing from you, and thank you once again for choosing Universal Audio.

Sincerely,

A handwritten signature in black ink, appearing to read 'Bill Putnam Jr.', with a stylized, cursive script.

Bill Putnam Jr.

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# Introducing Apollo Solo

## Shape your Recordings Into *Records* with Genuine UA Conversion and Classic Studio Sounds.

Apollo Solo is the world's finest Thunderbolt 3-powered desktop recording audio interface for Mac and Windows — delivering class-leading audio conversion, two Unison™ mic preamps, and a suite of onboard UAD plug-ins for recording album-quality results, in real time.

This compact 2x4 interface starts with esteemed Apollo A/D and D/A conversion to sonically outperform anything in its class. And with its Unison technology and built-in UAD-2 processing, you can record through classic studio tools including the UA 610-B Tube Preamp & EQ, LA-2A and 1176 compressors, and more — with near-zero latency.

### Now You Can:

- Record with class-leading A/D and D/A conversion — as heard on hundreds of hit records
- Track with near-zero latency through mic preamp and guitar amp emulations from Neve®, API®, Fender®, and more using Unison™ technology\*
- Mix with included UAD plug-ins like the Teletronix® LA-2A and 1176 compressors, Pultec® EQs, and more
- Includes LUNA Recording System — a fully-integrated and inspiring music production application (Mac only)
- Create on-the-go with a sonically superior, bus-powered interface with rugged all-metal construction
- Enjoy clear, detailed monitoring with the best-sounding headphone amplifier in its class

### Unison™ Technology for Stunning Mic and Guitar Preamp Emulations

Apollo Solo's Unison technology gives you the tone, touch, and “feel” of the world's most sought-after preamps. These include the bundled UA 610-B Tube Preamp, plus authentic mic preamp emulations from Neve® and API®, plus guitar amp emulations from Fender® and Marshall® — complete with their signature impedance, gain stage “sweet spots,” and component-level circuit behaviors.\*

The secret to Unison is its hardware-software integration between Apollo Solo's mic preamps and its onboard UAD-2 processing. Simply place a Unison preamp plug-in on your mic input in Apollo Solo's Console software, and it physically reconfigures Apollo Solo's impedance and gain staging — giving you the classic tube and transformer sounds of the world's most recorded mic preamps and guitar amps.

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## **A Full Suite of Classic Studio Processing Onboard**

Right out of the box, Apollo Solo provides a suite of incredible analog emulation plug-ins including the world's only authentic Teletronix LA-2A and 1176LN compressors, Pultec EQs, and much more. From the tube warmth of the Pultec EQ on guitars, to the gentle limiting of the LA-2A on vocals, your recordings will take a giant leap forward in rich, sonically complex analog sound.

## **Access the World of UAD Powered Plug-Ins**

Beyond the included Realtime Analog Classics plug-ins, Apollo Solo lets you tap into the full library of award-winning UAD Powered Plug-Ins — including vintage EQs, Compressors, Reverbs, Tape Machines, Auto-Tune and more — in real time. With exclusive emulations from Neve, Ampex, Lexicon, Fender, Antares, Moog, and more,\* the creative possibilities are nearly endless.

## **Vintage Guitar and Bass Amps**

For guitarists and bassists, Apollo Solo includes Unison technology on its front panel instrument input — giving you access to dead-on emulations of amps like the Fender® '55 Tweed Deluxe, Ampeg® B-15N Bass Amplifier, and the included Marshall® Plexi Classic — all available at near-zero latency for songwriting and recording.

## **Create with a Fast, Natural Workflow in LUNA**

Apollo Solo is the ideal entry point to LUNA, UA's groundbreaking music production application. Whether you're exploring the analog sounds and workflow of Neve summing and Studer tape Extensions or creating with inspiring LUNA Instruments like Moog Minimoog and Ravel grand piano, LUNA transforms Apollo Solo into a fully-integrated recording system.

## **Best-in-Class Headphone Amplifier**

Apollo Solo's onboard headphone output is louder and punchier, with lower noise and flatter frequency response versus any interface in its class. This means you can confidently track and mix using headphones, knowing you're hearing every sonic detail.

## **Ready to Go**

With its robust all-metal construction and bus-powered Thunderbolt 3 operation, Apollo Solo is the only “clutter-free” portable audio interface that truly delivers album-quality results. It's like having a virtual analog studio that fits onto any desktop, and easily travels in your laptop bag.

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# Apollo Solo Hardware Features

## Key Features

- Best in class audio quality with 24-bit/192 kHz conversion
- Realtime UAD Processing — track through vintage compressors, EQs, tape machines, and guitar amp/pedal plug-ins with near-zero latency
- 2 premium mic/line preamps, 2 monitor outputs, front-panel Hi-Z instrument input and stereo headphone output
- Unison™ technology for stunning models of classic mic preamps and guitar amps
- UAD-2 DSP accelerator processing onboard
- Thunderbolt 3 connection for blazing-fast PCIe speed on modern computers
- Bus-powered design provides portability and less cable clutter
- Uncompromising analog design, superior components, and premium build quality throughout

## Audio Interface

- Sample rates up to 192 kHz at 24-bit word length
- 2 x 4 simultaneous input/output channels
  - Two channels of analog-to-digital conversion via:
    - Two balanced mic/line inputs
    - One Hi-Z instrument input
  - Four channels of digital-to-analog conversion via:
    - Stereo monitor outputs
    - Stereo headphone output

## Microphone Preamplifiers

- Two high-resolution, ultra-transparent, digitally-controlled analog mic preamps
- Unison technology for stunning models of classic mic preamps and guitar amps
- Front panel and software control of all preamp parameters
- Low cut filter, 48V phantom power, 20 dB pad, polarity inversion, and stereo linking

## Monitoring

- Stereo monitor outputs
- ¼" stereo headphone output
- All outputs are independently addressable

## UAD-2 Inside

- Onboard UAD-2 DSP Accelerator with SHARC® SOLO core processing
- Realtime UAD Processing on all inputs
- Same features and functionality as other UAD-2 devices and plug-ins when used with a DAW
- Complete UAD Powered Plug-Ins library is available online

## Other

- Attractive and durable desktop form factor
- Easy firmware updates
- One year limited warranty

## Package Contents

- Apollo Solo Thunderbolt 3 Audio Interface
- Getting Started URL card

# Apollo Solo Software Features

## Console Application

### *General:*

- Enables tracking and/or monitoring with Realtime UAD Processing and Unison technology
- Analog-style mixer for low-latency monitoring and tracking with UAD plug-ins
- Remote control of Apollo Solo hardware features and functionality
- Console sessions can be saved/loaded for instant recall of any configuration
- Virtual I/O for routing DAW channels into Console and Console channels into DAW
- Multiple Undo/Redo for edit operations

### *Realtime UAD Processing:*

- UAD plug-in processing on Apollo Solo inputs with indiscernible latency
- Up to five UAD plug-ins can be serially chained on each input and aux return
- UAD insert processing can be monitored while recording wet or dry
- Sub-2ms round-trip latency with five serial UAD plug-ins at 96 kHz sample rate

### *Channel Inputs:*

- Input channels for hardware and virtual inputs
- Level, pan, solo, and mute controls on all inputs
- Two stereo auxiliary sends with level and pan controls on all inputs
- Virtual inputs accept any outputs from DAW
- Stereo headphone cue sends with level and pan controls on all inputs and auxes
- Adjacent input pairs can be linked for convenient stereo control

### **Monitoring:**

- Stereo monitor mix bus with level, mute, solo, dim, and source select controls
- Separate stereo headphone cue mix bus
- Independent monophonic sum controls for both mix buses

### **Auxiliary Buses:**

- Two stereo auxiliary send/return buses with independent level, mute, and mono sum controls
- Four plug-in inserts per auxiliary return for Realtime UAD Processing on auxes
- Auxiliary buses can be routed to main monitor mix and/or headphone outputs
- Independent pre/post switching on each auxiliary bus

### **Metering:**

- Signal level meters with peak hold and clip indicators on all inputs
- Dual peak hold meters with signal peak LEDs display monitor bus levels
- Input meters are globally switchable to display pre or post fader signal levels
- Independently selectable peak/clip hold times and global clear clips button

### **Console Recall plug-in**

- Convenient access to Console's monitor controls via DAW plug-in
- Saves Apollo Solo configurations inside DAW sessions for easy recall of settings
- VST, AAX 64, and Audio Units plug-in formats

### **UAD Powered Plug-Ins**

- Award-winning audio plug-ins for monitoring, tracking, mixing, and mastering
- UAD plug-ins can be used simultaneously within Console and/or DAW
- All UAD plug-ins include fully-functional 14-day demo period
- Complete UAD plug-ins library is available online at [www.uaudio.com](http://www.uaudio.com)

### **UAD Meter & Control Panel application**

- Configures global UAD settings
- UAD-2 resource gauges for DSP and Memory usage
- Facilitates automatic authorization of UAD plug-in licenses

### **Device Drivers**

- All hardware inputs and outputs can be individually addressed by DAW
- All of Console's mix buses can be routed to DAW inputs for recording
- I/O Matrix feature for customizing Core Audio & ASIO I/O routes and names

## UAD Powered Plug-In Features

- Run UAD plug-ins with Apollo Solo's integrated UAD-2 DSP Accelerator
- Apollo Solo includes the Realtime Analog Classics UAD plug-ins bundle
- Over 100 UAD plug-ins available at the UA online store
- Fully functional 14 day demo available for all UAD plug-ins
- Realtime UAD Processing via Console allows monitoring and tracking through UAD plug-ins with near-zero latency, regardless of DAW's I/O buffer setting
- Includes VST, AAX 64, and Audio Units plug-in formats for compatibility with all major DAWs including Cubase, Pro Tools, Logic Pro, and more



*Some of the UAD plug-ins included with Apollo Solo*

# About Apollo Solo Documentation

Documentation for Apollo Solo and UAD Powered Plug-Ins are separated by areas of functionality, as described below. The user manuals are placed on the system drive during software installation. They can also be downloaded at [help.uaudio.com](http://help.uaudio.com).

***Note:** All manual files are in PDF format. PDF files require a free PDF reader application such as Preview (included with macOS) or Edge (included with Windows 10).*

## Apollo Solo Manual

The Apollo Solo user manual includes everything about Apollo Solo except the descriptions of, and operating instructions for, individual UAD plug-in titles.

**Hardware** – Complete details about the Apollo Solo hardware, including detailed descriptions of all hardware features, controls, connectors, and specifications.

**Software** – Detailed information about how to integrate Apollo Solo’s functionality into the DAW environment and configure and operate all Apollo Solo software features using the Console application, Console Settings window, and Console Recall plug-in.

**System** – Detailed information about the overall Apollo Solo/UAD-2 system, the UAD Meter & Control Panel application, buying optional plug-ins at the UA online store, and more.

## UAD Plug-Ins Manual

The features and functionality of all individual UAD Powered Plug-Ins developed by Universal Audio are detailed in the UAD Plug-Ins Manual. Refer to this document to learn about the operation, controls, and user interface of each UAD plug-in title developed by UA.

## Direct Developer Plug-In Manuals

UAD plug-ins include titles created by our Direct Developer partners. Documentation for these 3rd-party plug-ins are separate files written and provided by the plug-in developers. The file names for these plug-in manuals are the same as the plug-in titles.

## Accessing Installed Documentation

Either of these methods can be used to access the installed documentation files:

- Choose Documentation from the Help menu within the Console application
- Click the Product Manuals button in the Help panel within the UAD Meter & Control Panel application
- Manuals are also available online at [help.uaudio.com](http://help.uaudio.com).

## Host DAW Documentation

Each host DAW software application has its own particular methods for configuring and using audio interfaces and plug-ins. Refer to the host DAW documentation for specific instructions about using audio interface and plug-in features within the DAW.

## Glossary

This manual uses technical terms and acronyms that may be unfamiliar. Refer to the [Glossary](#) for the definitions of many of these terms.

## Hyperlinks

Links to other manual sections and web pages are [highlighted in blue text](#). Click a hyperlink to jump directly to the linked item.

*Tip: Use the back button in the PDF reader application to return to the original page after clicking a hyperlink.*

## Technical Support

For additional resources, or if you need to contact Universal Audio for assistance, see the [Technical Support](#) page.





# Getting Started

## Overview

Before you can use Apollo Solo, you need to complete these steps:

1. Connect Apollo Solo to your computer with a Thunderbolt™ 3 cable (not included)
2. Download and install the latest UAD software
3. Register your Apollo Solo hardware
4. Authorize your UAD plug-ins

Additionally, you'll want to learn these essential Apollo Solo operations:

- [Connect to Input Sources and Monitor System](#) – How to connect your audio gear.
- [Setting Hardware Input/Output Levels](#) – Learn how to adjust Mic/Line/Instrument input gain levels and monitor/headphone output volume levels.

This chapter will guide you through these procedures. For assistance, see the [Technical Support](#) page.

## Apollo Solo System Requirements

**Note:** For operating system and storage requirements, and complete compatibility information, please visit [help.uaudio.com](http://help.uaudio.com).

- Mac or Windows computer with available Thunderbolt 3 port
- Thunderbolt 3 cable (not included)
- Internet connection to download software and authorize UAD plug-ins
- Quad Core i7 or better processor recommended

# Hardware Setup

## Choose a Suitable Location

- Locate Apollo Solo on a flat surface.
- The location should be sturdy enough to securely hold its weight and withstand the pressure of operating the top panel controls.
- Leave enough room at the front and rear of the unit for connecting cables.

## Connect Apollo Solo to the Computer

**Caution:** Before connecting Apollo Solo to the computer, lower the volume of the monitor speakers (if connected) and remove headphones from your ears.

1. Connect a Thunderbolt 3 cable (not included) to the Thunderbolt 3 port on Apollo Solo's rear panel.
2. Connect the other end of the Thunderbolt 3 cable to a Thunderbolt 3 port on the computer.

## About Thunderbolt 3 Power

- Apollo Solo is bus powered by its Thunderbolt 3 connection to the computer. A power cable, external power supply, or Thunderbolt 2 cable cannot be used to power Apollo Solo.
- When using Apollo Solo with notebook computers, connecting the computer to AC power is suggested to conserve the computer's battery resources.
- When notebook computers are sleeping, power events such as connecting/disconnecting Thunderbolt devices, USB-C devices, and/or power adapters may cause peripheral devices (including Apollo Solo) to briefly power on.

## About Thunderbolt 3 Ports and Cables

**Important:** Although Thunderbolt 3 always uses USB-C connectors, not all USB-C ports are Thunderbolt 3 ports. Similarly, not all USB-C cables are Thunderbolt 3 cables. Always connect Apollo Solo to a Thunderbolt 3 port with a Thunderbolt 3 cable.

### USB-C is not Thunderbolt 3

Thunderbolt 3 uses USB-C connections to transfer data and power. However, USB-C is simply a connector type; it doesn't determine the type of data used by the connector. For example, USB-C connections can be used for Thunderbolt 3, USB 3.1, and other data protocols, so USB-C connections are not always interchangeable.

### Does your USB-C connector support Thunderbolt 3?



To determine if a USB-C port or cable connector supports Thunderbolt 3, look for the Thunderbolt icon. The Thunderbolt icon on a USB-C port or cable means the connector supports Thunderbolt 3. Alternately, confirm Thunderbolt 3 compatibility with the device and/or cable manufacturer.



*Thunderbolt icon on USB-C cable (left) and USB-C port (right)*

## Software Setup

The Apollo Solo software must be installed to use Apollo Solo and UAD plug-ins. The UAD Powered Plug-Ins Installer places the software onto the computer's startup drive. After software installation, you'll register your Apollo Solo hardware and authorize your UAD plug-ins.

### Our Web Pages Guide You

The Universal Audio website guides you through the process of UAD software installation, Apollo Solo hardware registration, and UAD plug-in authorization. The procedure you'll follow to complete this process is detailed below, but the web pages can guide you.

To begin the installation, registration, and authorization process, visit:

[www.uaudio.com/register](http://www.uaudio.com/register)

If you've already registered your Apollo Solo and simply want to update to a newer version of UAD software, the latest UAD software is available at [www.uaudio.com](http://www.uaudio.com).

### Installation, Registration, and Authorization Procedure

**Note:** For optimum results, connect Apollo Solo to the computer before installing the UAD software.

1. Visit [www.uaudio.com/register](http://www.uaudio.com/register) and follow the on-screen instructions.
2. Connect Apollo Solo to a Thunderbolt 3 port on the computer with a Thunderbolt 3 cable (not included) then download the UAD software installer.
3. Open the downloaded UAD installer application. The software installer will guide you. Be sure to restart the computer when prompted.

**Note:** If prompted to update the Apollo Solo firmware, see the procedure below.

4. After restarting, your web browser launches and connects to the Universal Audio website. Follow the instructions on our web pages to complete registration of your Apollo Solo hardware and claim your bundled UAD plug-ins.
5. After registration is complete, authorize your UAD system by following the guidance on the registration web pages (or see the [UAD Authorization Procedure](#)).

**Note:** On Windows computers, see [Windows Setup](#) for additional steps. On Mac computers, Apollo Solo is ready for use.

### Firmware Update Procedure

If the "Apollo Solo Firmware Update" dialog window appears:

1. Click "Load" to begin the process. The "firmware is updating" window appears.
2. Wait for the "Power Off Apollo Solo" window, which appears after the firmware is updated.
3. Disconnect Apollo Solo from the computer for several seconds to power off Apollo Solo. After reconnecting to the computer, the firmware update is complete.

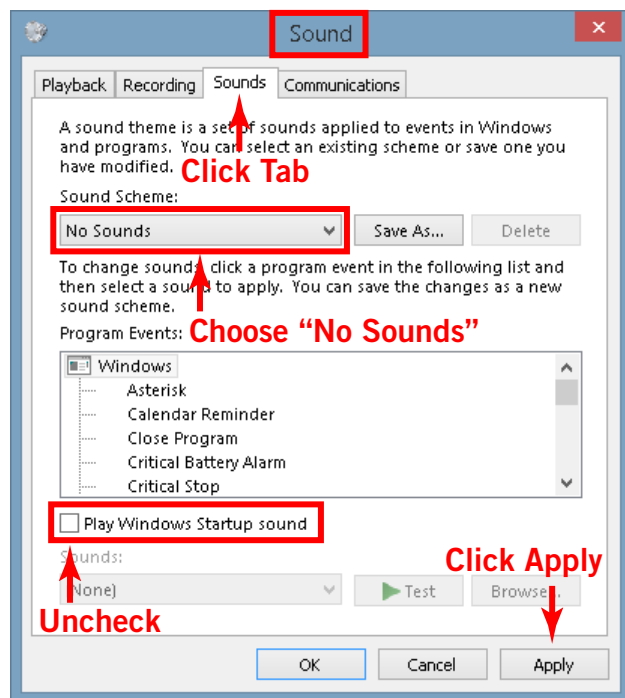
# Windows Setup

## Disable Windows Notification Sounds

Windows notification sounds (such as a "ding" when an alert window appears) can interfere with DAW audio. Follow the procedure below to disable all notification sounds.

1. Open the Sound control panel. Sound can be accessed by right-clicking the Windows Start Menu and selecting Control Panel from the contextual menu, clicking Hardware and Sound, then clicking Sound within the Hardware and Sound window.
2. Click the Sounds tab within the Sound control panel window. The Windows notification sounds options are displayed.
3. Click the "Sound Scheme" drop menu to display the menu items.
4. Select "No Sounds" from the Sound Scheme drop menu.
5. Click the Apply button to activate the new setting.

**Important:** Ensure the "Play Windows Startup sound" box is unchecked.



Correct setting shown — "No Sounds" scheme is selected in Sound control panel

**Important:** See [Windows WDM System Sound Notes](#) for important related information when using Apollo Solo for system sound I/O.

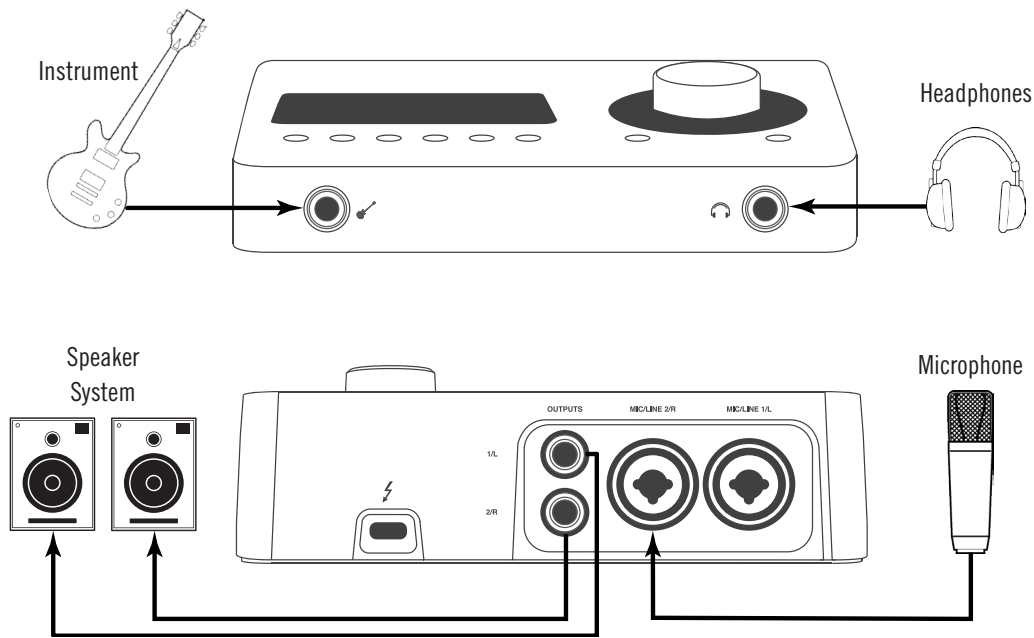
## Additional Windows Optimizations

- Visit the Apollo Solo Knowledge Base at [help.uaudio.com](http://help.uaudio.com) for updated technical news and system optimization information.

# Audio Setup

## Connect to Input Sources and Monitor System

One typical Apollo Solo audio setup is illustrated below. For complete details about all of Apollo Solo's connectors and controls, see the [Hardware Controls & Connectors](#) chapter in this manual.



*Typical Apollo Solo audio connections*

## Audio Connection Notes

- **Important:** When plugging into a rear panel combo jack input, the input source jack (either XLR or ¼" phone) must be manually selected with the top panel INPUT button while in [PREAMP Mode](#). Select MIC when connecting XLR plugs, and LINE when connecting ¼" phone plugs. See [Controls Overview](#) for details.
- When an instrument is plugged into the front panel Hi-Z jack, channel 1 automatically switches to the Hi-Z input. To use a MIC or LINE input with channel 1, the Hi-Z instrument jack must be disconnected.
- The main outputs are line level. Connect the main outputs to the line level inputs of powered monitors or an amplifier+speaker system. Balanced TRS or unbalanced TS cables with ¼" plugs may be used.
- In the illustration above, the microphone is plugged into input 2 so the mic (channel 2) can be used at the same time as the Hi-Z instrument (channel 1).
- For optimum sonic performance, always use high-quality shielded audio cables.

## Setting Hardware Input/Output Levels

This section explains how to set input gain levels for the hardware inputs (mic, line, and Hi-Z instrument) and adjust volume levels for the stereo hardware outputs (monitor speakers and headphones). Refer to the [Top Panel](#) and [Display Panel](#) illustrations for the control names and numbers mentioned below.

**Important:** *Before proceeding, lower the volume of the monitor speakers and remove headphones from your ears.*

### Set Input Gains

1. Select the input channel to be adjusted by pressing the PREAMP button (4) until the Channel Selection Indicator (7) displays the channel (CH1 or CH2).
2. Select the input jack (MIC or LINE) by pressing the Input Select button (5-a) until the Input Selection indicator (9) displays the desired input jack\* (see note below).
3. Adjust the channel's gain by increasing the LEVEL knob (1) until the input meter for the channel (8) approaches maximum, but does not reach the red clip LED when the loudest input signal is present. If the level is too high to avoid clipping (if the red "C" LED illuminates) when the LEVEL knob is all the way down, enable the attenuation PAD (5-d).
4. To set the input gain for the other input channel, repeat steps 1 – 3.

### Adjust Output Volumes

1. Select the output volume to be adjusted (monitor or headphone) by pressing the MONITOR button (3) until the Monitor Selected (10) or Headphone Selected (12) indicator is lit.
2. Set the volume level by carefully increasing the LEVEL knob (1) until the desired volume is reached (you might need to adjust the volume of the speaker system).
3. To set the volume for the other output (monitor or headphone), repeat steps 1 – 2.

### Mute (and Unmute) Monitor Outputs

1. Select the Monitor outputs by pressing the MONITOR button (3) until the Monitor Selected (10) indicator is lit.
2. Press the LEVEL knob (1) to mute the monitor outputs. The Volume Level Indicator LEDs (2) are red when the monitors are muted and MONITOR is selected (10).
3. To toggle the monitor mute state, press the LEVEL knob (1) whenever MONITOR (10) is selected.

#### Notes:

- \*The Hi-Z input is automatically selected and overrides the channel 1 MIC and LINE inputs when a ¼" mono TS (tip-sleeve) plug is connected to the Hi-Z Instrument jack (14) on the front panel.
- To control both channels simultaneously when a stereo source is connected, press the LINK button (5-f) when an input is selected (9).

## What Next?

After the initial setups in this chapter are complete, Apollo Solo is ready to be used with the included Console application, your DAW (digital audio workstation) software, and UAD Powered Plug-Ins. To learn how to operate Apollo Solo, refer to the areas of functionality below.

### Hardware Controls & Connectors

To learn how to use the controls on Apollo Solo's top panel and how the front and rear connections can be used, see [Hardware Controls & Connectors](#).

### Apollo Solo System Overview

Reviewing the [Apollo Solo System Overview](#) is especially recommended for those that are unfamiliar with digital audio workstation environments.

### Using Apollo Solo's Unique Features

Apollo Solo has unique features in addition to those of a typical audio interface. To take advantage of Apollo Solo's low-latency input monitoring, Realtime UAD Processing, and UAD-2 DSP accelerator features, there are some core differences in how to operate the DAW with Apollo Solo versus most audio interfaces.

To learn how to integrate Apollo Solo and Console within a DAW environment and related information, see the [Working With Apollo Solo](#) chapter.

### Console Application

The included Console application is the software interface for the Apollo Solo hardware. Console controls Apollo Solo's mixing, low-latency input monitoring, and Realtime UAD Processing features. Console is also used to configure various Apollo Solo settings.

For an overview of Console's features and functions, see [Console Overview](#). For complete details about how to operate every Console function and setting, see [Console Reference](#).

### Operating UAD Plug-Ins

To learn how to load, edit, and remove UAD plug-ins within Console, see [Console Plug-In Inserts](#). To learn how to use UAD plug-ins within the DAW, see the DAW documentation.

The features and functions of individual UAD plug-in titles are detailed in the [UAD Plug-Ins Manual](#). Refer to these manuals to learn about the operation, controls, and user interface of each individual UAD plug-in.

### Technical Support

For additional resources such as setup and operation videos, the UA Knowledge Base, user community forums, or if you need to contact Universal Audio for assistance, see the [Technical Support](#) page.



# Hardware Controls & Connectors

Complete details about all Apollo Solo hardware controls and connector jacks are provided in this chapter.

*Tip:* To learn how to set input gain levels (Mic, Line, and Hi-Z instrument) and output volumes (monitors and headphones), see [Setting Hardware Input/Output Levels](#) in the *Getting Started* chapter.

## Controls Overview

Some Apollo Solo controls have multiple functions. The function of each control depends on the current operating mode and the current settings within that mode. To control a particular function, the control must be activated.

## Operating Modes

Apollo Solo's top panel has two operating modes: *PREAMP* and *MONITOR*. The function and availability of the top panel controls vary depending on the active operating mode. The active mode is selected with the PREAMP and MONITOR buttons. Press the button to activate the mode. Each mode is explained in greater detail below.

*Tip:* All top panel functions can be operated at the same time (without switching modes) from within the companion Console software application.

## PREAMP Mode

When Apollo Solo is in preamp mode, the top panel controls adjust the input functions only. To adjust any input function, press the PREAMP button to enter preamp mode and activate the input channel controls.



*Important:* Apollo Solo must be in PREAMP mode to adjust input channel settings with the hardware controls. Input settings can be adjusted with the Console software application when Apollo Solo is not in preamp mode.

## Preamp Channels

Apollo Solo has two independent analog input channels. Each input channel has a preamplifier. Both input channels can be independently controlled and used at the same time for A/D conversion.

## Preamp Controls

Apollo Solo has one set of input channel preamp controls. The input channel controls adjust all preamp functions for the currently selected input channel. The other input channel preamp can be adjusted by changing the selected channel.

## Selected Channel

The currently selected input channel is shown by the CH1 and CH2 indicators at the upper left of the main display panel, above the input meters, as shown at right. The top panel controls adjust the functions of the currently selected channel only.



Selected channel indicators

**Important:** To adjust an input channel's settings, that input channel must be selected. The currently selected channel may need to be changed to the other channel.

## Changing Channels

When in preamp mode, press the PREAMP button to change the selected input channel so its controls can be adjusted. Press PREAMP again to switch the selected channel back to the other channel.

**Tip:** When in PREAMP mode, pressing the main LEVEL knob also changes the selected channel.

## Input Source

The Mic, Line, or Hi-Z inputs are routed into the input channel's preamplifier. The active input source is shown by the indicators below the input meters, as shown at right.



Input source indicators

The Mic or Line input source is selected by the pressing the INPUT button when the channel is selected. The Hi-Z input (available on channel 1 only) is automatically selected when an instrument cable is plugged into the Hi-Z input on the front panel.

**Note:** Only one input source at a time (Mic, Line, or Hi-Z) can be used as the channel's input source.

## Preamp Gain

When an input channel is selected, its input gain is adjusted with the main LEVEL knob. Preamp gain is applied to the Mic, Line, or Hi-Z input of the selected channel.

## Preamp Options

Each input channel has six preamp options. The preamp options for the currently selected input channel are enabled using the row of six buttons at the bottom of the top panel when in PREAMP mode.



Preamp options display

The current state of the preamp options is displayed by the six options indicators (shown above) at the bottom of main display. Available options are dim when inactive, bright when enabled, and unlit when unavailable.

**Note:** Not all preamp options are available with all input types. For specific details, see the [Top Panel](#) section later in this chapter.

## MONITOR Mode

When Apollo Solo is in monitor mode, all top panel controls are related to output functions only. To adjust any output function, press the MONITOR button to enter monitor mode and activate the monitor controls.



**Important:** Apollo Solo must be in MONITOR mode to adjust the volume of the monitor and headphone outputs with the hardware controls. Monitor volume can be adjusted with the Console software application when Apollo Solo is not in monitor mode.

## Stereo Outputs

Apollo Solo has two stereo outputs that can be controlled with the top panel hardware: MONITOR and HEADPHONE. These two stereo outputs are independently controlled.

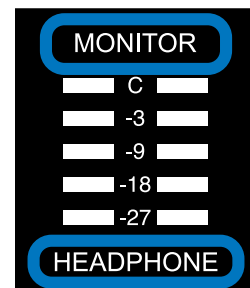
## Output Volume

The LEVEL knob is used to set the volume level for each stereo output independently. The LEVEL knob adjusts the volume of the currently selected output only.

## Output Selection

The currently selected output is shown by the MONITOR and HEADPHONE indicators at the right of the main display, above and below the output meters.

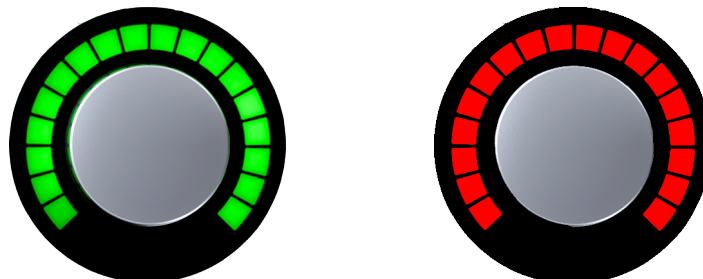
When in monitor mode, press the MONITOR button to change the selected output. Press MONITOR again to switch back to the other output.



*Output selection indicators*

## Monitor Mute

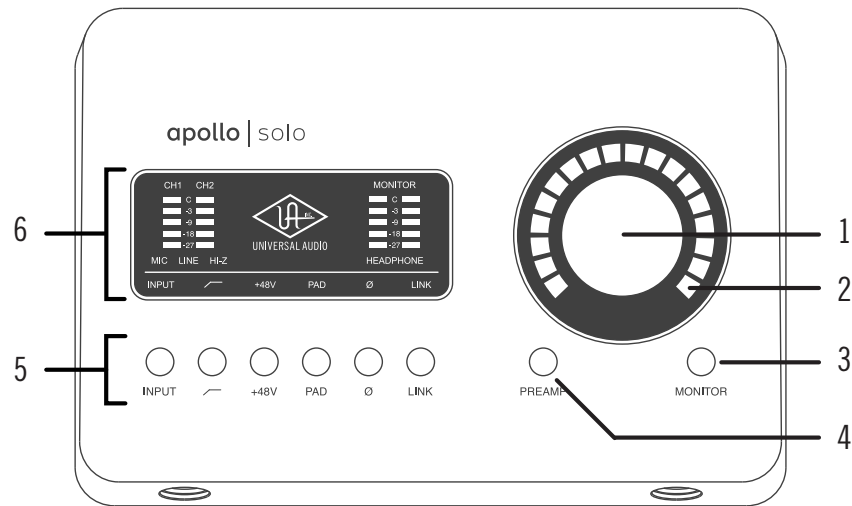
When MONITOR is selected, press the LEVEL knob to mute (silence) the stereo monitor outputs. Press the LEVEL knob again to unmute the monitor outputs. The green level indicators (the ring of LEDs around the LEVEL knob) and the monitor output selection indicator are RED when the monitor outputs are muted.



*LED ring showing monitor outputs unmuted (left) and muted (right)*

# Top Panel

Refer to the illustration below for descriptions in this section.



Top panel elements

## (1) LEVEL Knob & Switch

The LEVEL knob & switch controls multiple functions. The knob's current function is selected with the MONITOR (3) and PREAMP (4) buttons.

### Monitor Mode

When in **MONITOR Mode** (3), rotate clockwise to increase the monitor output level or headphone output level, depending on which output (10 or 12) is selected with the MONITOR (3) button.

When MONITOR (10) is selected in monitor mode, press to mute/unmute the monitor outputs.

**Note:** MUTE does not apply to the headphone output.

### Preamp Mode

When in **PREAMP Mode** (4), rotate the knob clockwise to increase the amount of preamp gain for the currently selected input channel.

**Tip:** When in preamp mode, press to toggle between selection of channels 1 & 2.

### Unison Integration



The LEVEL knob can be used to control Unison-enabled UAD preamp plug-ins. See the [Unison](#) chapter for complete details.

## (2) PREAMP Gain & Volume Level Indicator LEDs

The LEDs around the LEVEL knob indicate the relative level of the selected function (input preamp gain or monitor/headphone volume).

**Note:** The indicator LEDs are RED when MONITOR (3) is selected and MUTE is active.

## (3) MONITOR Button

Press this button to enter MONITOR mode for controlling the monitor and headphone functions. Press again to alternate between control of MONITOR and HEADPHONE volumes with the LEVEL knob (1).

**Tip:** Indicators (10) and (12) determine which volume (monitor or headphone) is being controlled with the LEVEL knob (1).

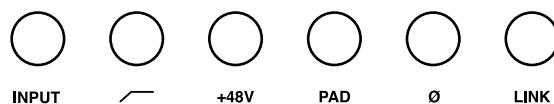
## (4) PREAMP Button

Press this button to enter PREAMP mode and activate the input channel controls. Press again to alternate between channels 1 & 2.

**Tip:** When in preamp mode, press the LEVEL knob (1) to toggle between selection of channels 1 & 2.

## (5) Preamp Option Buttons

These six buttons control the [Preamp Options](#) (a through f on following page) when the input channel is selected (7). The preamp option is active when its indicator is lit. When MONITOR (10) or HEADPHONE (12) is selected, the preamp options cannot be modified and the options display (13) is unlit. See the next page for preamp option descriptions.



*Preamp option buttons*

## Unison Integration



In PREAMP mode, the option buttons can be used to control Unison-enabled UAD plug-ins. See the [Unison](#) chapter for complete details.

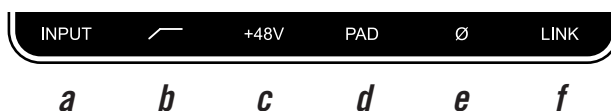
## (6) Display Panel

This panel displays the status of various Apollo Solo functions. See [Display Panel](#) for detailed descriptions of all panel elements.

## Preamp Options

The option buttons control the PREAMP options (labeled a through f below) for an input channel when that channel is selected (7) with the PREAMP button (4). A preamp option is active when its indicator (13) in the display is lit, and inactive when the indicator is dim. If the indicator is unlit, the option is unavailable.

**Note:** In *MONITOR Mode*, the preamp options cannot be modified and all preamp options in the display are unlit.



*Preamp options*

### **(a) INPUT Select**

Selects the active input source jack for the channel. Press to alternate between the mic and line inputs. The current selection is displayed by the input source indicators (7).

The Hi-Z input is selected automatically whenever a ¼" mono (tip-sleeve) plug is connected to the front panel's Hi-Z Instrument jack (14).

**Note:** *Hi-Z instrument input is available for channel 1 only.*

### **(b) FILTER**

Enables a low cut (high pass) rumble filter with a cutoff frequency of 75 Hz.

### **(c) +48V**

Enables +48 Volt phantom power for the mic input. Phantom power is typically needed for condenser microphones. +48V is available for the microphone inputs only.

**Caution:** *To avoid potential equipment damage, disable +48V phantom power on the channel before connecting or disconnecting its XLR input.*

### **(d) PAD**

Attenuates (lowers) the mic input signal level by 20 dB. Pad is unavailable for the line inputs and the Hi-Z instrument input.

### **(e) POLARITY Ø**

Inverts the polarity (aka phase) of the input signal. Polarity inversion can help reduce phase cancellations when more than one microphone is used to record a single source.

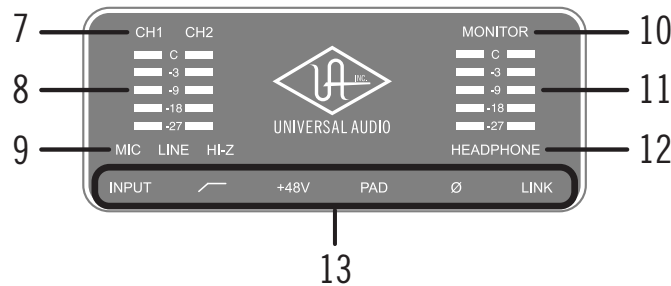
### **(f) LINK**

Links input channels 1 and 2 as a stereo pair. When the inputs are stereo linked, all input control adjustments are applied to both input channels equally.

**Note:** *The Hi-Z instrument input cannot be linked to a mic or line input. Therefore, LINK cannot be activated when a plug is inserted in the Hi-Z jack (14).*

# Display Panel

Refer to the illustration below for descriptions in this section.



Display panel elements

## (7) Channel Selection Indicators

The currently selected input channel is indicated by the lit channel name above its input meter (CH1 or CH2). Press the PREAMP button (4) to switch between channels 1 & 2.

## (8) Input Meters

These meters display the incoming signal level for input channels 1 & 2. Reduce the channel's preamp gain (see [Setting Hardware Input/Output Levels](#)) if its red clip LED illuminates.

## (9) Input Source Indicators

These indicators show which input source (MIC, LINE, or HI-Z) is active for the selected channel. Use the Input Select button (5-a) to change the input source.

**Note:** Hi-Z instrument input is available for channel 1 only.

## (10) Monitor Selected Indicator

When lit, the LEVEL knob (1) controls volume the monitor outputs (17). Press the MONITOR button (3) to activate the monitor controls if this indicator is not already lit.

**Note:** The MONITOR indicator (10) is RED when the monitor outputs are muted.

## (11) Stereo Output Meters

These meters display the main stereo signal output levels.\* Output meter levels are independent of monitor and headphone volume levels. If a red "C" (clip) LED at the top of the Output Meters illuminates, reduce levels feeding the output(s).

**\*Exception:** If HEADPHONE is currently selected (12) and the Headphone Source within the CUE OUTPUTS window in the Console software application is set to HP, these output meters indicate the level being sent to the headphone bus via Console's headphone sends and/or the DAW.

## (12) Headphone Selected Indicator

When lit, the LEVEL knob (1) controls the volume of the headphone output (15). Press the MONITOR button (3) to light this indicator and activate headphone volume control (you may need to push it twice).

## (13) Preamp Options Display

This area displays the status of the six preamp options, which are controlled by the six preamp option buttons (5). Three status indications are possible:

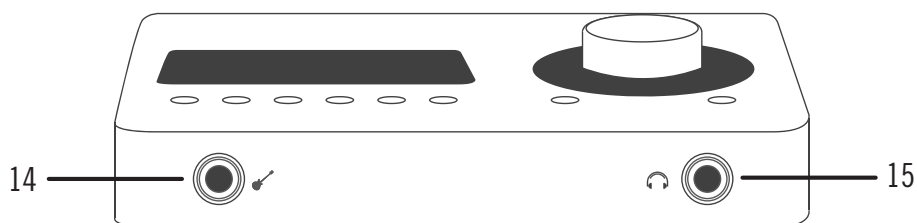
**Bright** – The preamp option is active.

**Dim** – The preamp option is inactive.

**Off** – The preamp option is not available.

## Front Panel

Refer to the illustration below for descriptions in this section.



*Front panel connectors*

## (14) Hi-Z Instrument Input

Connect any guitar, bass, or other high impedance instrument here. This jack automatically overrides the channel 1 mic and line inputs on the rear panel.

Levels for the Hi-Z instrument input are set using the same method as the mic and line inputs.

**Note:** This jack accepts a ¼" mono (tip-sleeve) plug only.

## (15) Headphone Output

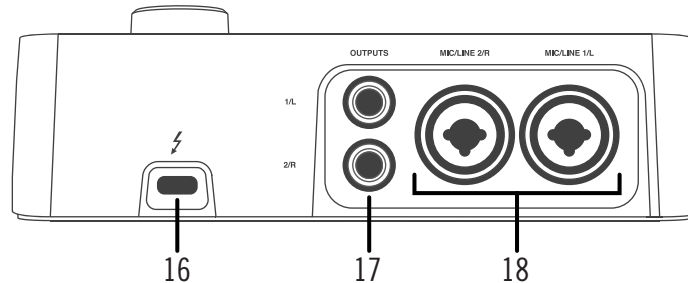
Connect ¼" stereo headphones here. Volume is set with the LEVEL knob (1) when HEADPHONE (12) is selected with the MONITOR button (3).



## Rear Panel

Refer to the illustration below for control descriptions in this section.

**Note:** All rear panel ¼" jacks can accept unbalanced TS (tip-sleeve) or balanced TRS (tip-ring-sleeve) connections.



Rear panel connectors

### (16) Thunderbolt 3 Port

Connect the Thunderbolt 3 cable (not included) here. A Thunderbolt 3 connection to the host computer is required to use Apollo Solo.

#### **Thunderbolt 3 Port Notes:**

- Apollo Solo requires a built-in Thunderbolt 3 via USB-C port for the computer connection.
- Although Thunderbolt 3 always uses USB-C connectors, not all USB-C computer ports are Thunderbolt 3 ports.
- Apollo Solo is incompatible with Thunderbolt 1 and Thunderbolt 2 computer ports, even if an adapter is used.
- See [About Thunderbolt 3 Power](#) and [About Thunderbolt 3 Ports and Cables](#) for related information.

### (17) Monitor Outputs

Connect powered monitor speakers (or an amplifier+speaker system) here. Volume is set with the LEVEL knob (1) when MONITOR is selected (10) with the MONITOR button (3).

**Caution:** Before powering Apollo Solo, lower the volume of the monitor speakers and remove headphones from your ears.

### (18) Mic/Line Inputs 1 & 2

The female combo jacks for channels 1 & 2 accept either a male XLR plug for connecting to the mic input, or a ¼" phone plug for connecting to the line input.

The input jack that is used for the channel (MIC or LINE) is specified with the Input Select button (5-a).

**Caution:** To avoid potential equipment damage, disable +48V phantom power on the channel before connecting or disconnecting its XLR input.

# Apollo Solo System Overview

To get the most from your Apollo Solo and UAD plug-ins, it helps to have an understanding of the overall Apollo Solo system. This chapter provides an overview of the Apollo Solo hardware and software components.

## Apollo Solo Hardware

### Thunderbolt 3 Bus Powered Audio Interface for Mac & Windows

First and foremost, Apollo Solo is a premium 2 x 4 bus-powered Thunderbolt 3 desktop audio interface with best-in-class 24-bit/192 kHz conversion. Apollo Solo connects to the inputs and outputs of other audio gear to perform analog-to-digital (A/D) and digital-to-analog (D/A) audio conversion of the gear's signals. The converted digital audio signals are routed into and out of a Thunderbolt 3 host computer via the high-speed PCIe protocol, which is carried over a single Thunderbolt 3 cable along with power for the unit.

Apollo Solo leverages Universal Audio's expertise in DSP acceleration, UAD plug-ins, and analog hardware design by integrating the latest cutting edge technologies in high-performance A/D–D/A conversion, DSP signal reconstruction, and connectivity.

### Integrated UAD-2 DSP Accelerator

Apollo Solo includes a built-in SOLO core UAD-2 DSP accelerator that performs digital signal processing using Universal Audio's acclaimed UAD Powered Plug-Ins. UAD plug-ins provide the world's best emulations of vintage and modern analog and digital hardware.

UAD plug-ins can run in Apollo Solo's Console software for realtime signal processing with indiscernible latency, delivering the ultimate sonic experience to artists while monitoring and/or tracking. UAD plug-ins can also be used within a DAW during mixdown and mastering.

**Note:** As with other UAD-2 and Apollo devices, Apollo Solo can only load UAD plug-ins, which are specifically designed to run on UAD-2 DSP accelerators. Native (host CPU-based) plug-ins cannot run on Apollo Solo's UAD-2 DSP.

### System Expansion

Apollo Solo is compatible with Universal Audio's family of UAD-2 DSP Accelerator and Apollo audio interface products, allowing you add UAD DSP and I/O as your needs grow.

Various Universal Audio products are available to accommodate your particular computer system, processing needs, and budget. For the complete product lineup, visit the UA website at [www.uaudio.com](http://www.uaudio.com).

# Apollo Solo Software

Apollo Solo has several software components that are part the complete Apollo Solo system. A brief description of each component is provided below, along with a link to complete details about the component.

## Console Application

The included Console application is Apollo Solo’s software interface. Console controls Apollo Solo’s input monitoring, Realtime UAD Processing, Unison technology, audio interface hardware settings, and more. Console’s analog-style workflow is designed to provide quick access to the most commonly needed features in a familiar, easy-to-use mixer interface.

Console is the key to unleashing the power of Apollo Solo. For an overview of the application, see [Console Overview](#). For complete details about every available function, see [Console Reference](#).

**Important Fundamental Concept:** *The primary function of Console is to control Apollo’s low-latency hardware input monitoring, Unison plug-ins, and Realtime UAD Processing with third-party DAWs (such as Pro Tools or Cubase). Console or LUNA Recording System **must** be used to take advantage of these features.*



Console application

## Realtime UAD Processing

Apollo Solo can process UAD Powered Plug-Ins with sub-2ms latency, delivering the ultimate sonic experience while monitoring and/or tracking your performance. This feature is named Realtime UAD Processing.

Realtime UAD Processing is a special function that is only available within Console. This function is completely independent of the DAW's I/O hardware buffer size setting, so even when the I/O buffer setting is high — where any plug-ins in a DAW have noticeable latency — UAD plug-in latency is still indiscernible.

With Realtime UAD Processing, up to five UAD plug-ins can be stacked in series without any increase in latency, for flexible and complex signal processing chains. Realtime UAD Processing is automatically active with every UAD plug-in that's inserted in Console. To learn more, see [Console Plug-In Inserts](#).

## Unison Technology

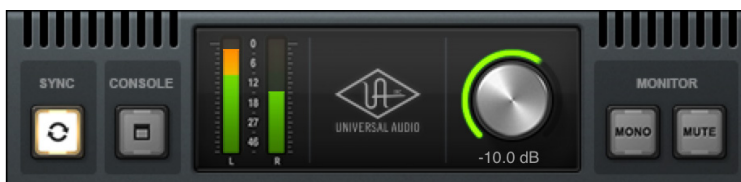
Unison™ is an exclusive analog/digital integration system built into Apollo Solo's microphone preamplifiers. Unison is an audio processing breakthrough that starts right at the source, the input stage, allowing Apollo Solo's mic preamps to sound and behave like the world's most sought-after tube and solid state preamps, guitar amps, and pedals — including their all-important impedance, gain stage “sweet spots,” and component-level circuit behaviors.

Unison is activated when a UAD Unison plug-in is loaded in Console's dedicated Unison insert slot. To learn more, see [Unison](#).

## Console Recall Plug-In

Console Recall is a special DAW plug-in supplied in VST, Audio Units, and AAX 64 formats. Console Recall offers additional convenience when using Apollo Solo and/or the Console application in conjunction with a DAW.

The Console Recall plug-in does not process audio. Instead, the primary function of Console Recall is to store complete Console configurations within the DAW project file. It also provides access to key Console functions (monitor volume, mono, and mute) without leaving the DAW. To learn more, see [Console Recall Plug-In](#).



*Console Recall plug-in*

## UAD Meter & Control Panel Application

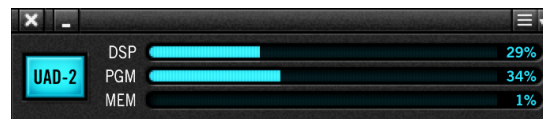
The UAD Meter & Control Panel application is used to configure global UAD-2 system functions and monitor UAD-2 DSP resources (including multiple devices, if connected). The application also facilitates authorization of UAD plug-ins and UAD-2 devices.

The application consists of two components: The UAD Meter, and the UAD Control Panels. To learn more, see [UAD Meter & Control Panel](#).

### UAD Meter

The UAD Meter displays the current UAD plug-in DSP and memory loads of all active UAD-2 hardware. These meters are also present at the bottom of the Console application window.

**Note:** *Apollo Solo uses DSP and memory for its internal DSP mixer. Therefore, the UAD meter displays DSP and memory usage even when UAD plug-ins are not in use.*

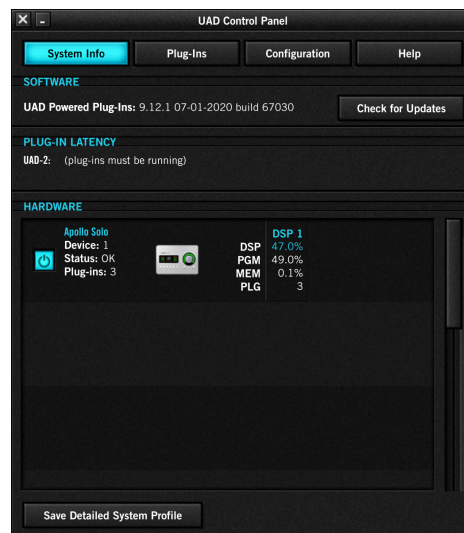


*UAD Meter*

### UAD Control Panels

The UAD Control Panel window has multiple panels that display, and enable control of, the various UAD-2 system, plug-in, and global configuration parameters.

The screenshot below shows the System Info panel, one of four control panel windows in the UAD Meter & Control Panel application.



*UAD Control Panel with System Info panel selected*

## UAD Powered Plug-Ins

UAD plug-ins are the software titles containing audio signal processing algorithms such as compressors, equalizers, mic preamps, guitar amps, and special effects. Each UAD plug-in contains various control parameters that can be adjusted to achieve the desired sonic results.

### The Authentic Sound of Analog

From project studios to multi-platinum mix engineers, UAD Powered Plug-Ins have been winning over audio professionals for more than 15 years with their stunning analog sound. The UAD library now features more than 90 plug-ins, co-created with the biggest brands in audio. Developed by UA's world-renowned team of DSP engineers, UAD plug-ins set the standard by which all other audio plug-ins are judged.



*Typical UAD plug-in interface*

### Plug-In Host Applications

UAD plug-ins are loaded within a host application (such as Apollo Solo's Console or a DAW) for signal processing of the host's audio signals on Apollo Solo's integrated UAD-2 DSP accelerator. UAD plug-ins are typically used in Console for Realtime UAD Processing when monitoring and tracking, and in a DAW when mixing and mastering. UAD plug-ins are provided in VST, AAX-64, and Audio Units formats for compatibility with all major DAWs.

***Tip:** When loaded in Apollo Solo's Console application, UAD plug-ins run in real time, with indiscernible latency, completely independent of the DAW's I/O buffer size setting.*

### Bundled & Optional Plug-Ins

Apollo Solo includes a variety of UAD plug-ins bundled with the device, and optional UAD plug-in licenses can be purchased at the UA online store.

### Try Before You Buy

All optional UAD plug-ins can be evaluated without functional limitations for 14 days in trial demo mode.

## Apollo Audio Interfaces

Apollo is Universal Audio's line of high-resolution audio interfaces with class-leading sound quality, Realtime UAD Processing, and elegant hardware design and workflow. Apollo Thunderbolt models include the Apollo Solo, Apollo Twin X, and Apollo x4 desktop interfaces, and the Apollo X Series rackmount interfaces.

Apollo Solo can be combined with Apollo Thunderbolt interfaces to increase I/O channel counts and UAD DSP processing power as your system needs grow. Up to six UAD devices can be connected in one system. See the [UA Knowledge Base](#) for specific details about multi-device compatibility for each model.



## UAD Software Installer

The UAD Powered Plug-Ins software installer contains all UA audio interface and UAD-2 software components and places them on the system drive during installation. These components include the Console and UAD Meter & Control Panel applications, all UAD plug-ins (including unlicensed plug-ins, UAD drivers, and documentation.



The UAD software installer supports all variations of UA audio interface and UAD-2 products. The most recent UAD software is always recommended so you'll have access to the latest UAD plug-ins and platform updates. The latest software is available at [www.uaudio.com](http://www.uaudio.com).

# LUNA Recording System

LUNA is the first recording platform with deep Apollo integration. LUNA transforms Apollo interfaces into the most inspiring and fully-integrated Mac-based recording systems on the planet.

LUNA gives Apollo owners the fastest recording environment for music production, editing, and mixing. In addition to its seamless hardware-software integration with Thunderbolt-equipped Apollo and Arrow interfaces, LUNA Recording System allows capturing audio through DSP-powered UAD plug-ins with no discernible latency, as well as offering new Accelerated Realtime Monitoring™ — which provides analog-style tracking and overdubbing workflows using Apollo's onboard DSP acceleration.

LUNA is included FREE with your Apollo purchase. Visit the LUNA product page for more information:

[www.uaudio.com/luna](http://www.uaudio.com/luna)





# UA Account & Store

## UA Account

Your Universal Audio account is where all your UAD devices, and their associated UAD plug-ins, are registered and managed.

An account is required to download UAD software, register and authorize your Apollo Solo hardware, claim bundled UAD plug-ins, and receive customer support.

## UA Store

The Universal Audio online store is where optional UAD plug-in licenses are purchased and UA coupons are redeemed. For related information, see [UA Account & Store](#).

## UAD Authorization

UAD plug-ins must be authorized before they will process audio. UAD plug-ins in your UA account are authorized automatically (internet connection required).

Note that UAD plug-in authorizations are stored on the UAD device, not the computer. If the device is moved to a different computer, it's not necessary to reauthorize the device.

When an optional UAD plug-in license is purchased at the UA store, it needs to be manually authorized. The store shows you how, or see [UAD Authorization Procedure](#) for instructions.

***Note:** When an optional UAD plug-in license is purchased, you don't download that individual plug-in. Instead, you reauthorize the system, which activates the UAD plug-in that is already installed.*

## UA Website

### UA Blog

The blogs at [www.uaudio.com](http://www.uaudio.com) contain a wealth of information about UA products and how to use them. In-depth artist interviews and how-to videos are routinely published.

### UA Knowledge Base

UA's Knowledge Base is your complete technical resource for the latest compatibility information, setup videos, customer support, and more. See the [Technical Support](#) page for details.

### Technical Support

For additional resources such as setup/operation videos, the UA Knowledge Base, user community forums, or if you need to contact Universal Audio for assistance, see the [Technical Support](#) page.

# Working With Apollo Solo

Apollo Solo is a flexible audio interface and DSP accelerator that can be used in many ways. This chapter explains how to setup and use Apollo Solo and Console in digital audio environments.

Each chapter section covers the area of functionality listed below. Click a blue page number to jump directly to the section for details.

*Tip: The [Apollo Solo System Overview](#) provides an introduction to the UAD environment.*

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# Essential Apollo Solo Concepts

Apollo Solo's basic audio interface functionality with a DAW operates the same as other typical (non-DSP) interfaces. However, Apollo Solo has unique features in addition to those of a typical audio interface.

To take advantage of Apollo Solo's unique low-latency input monitoring, Realtime UAD Processing, and UAD-2 DSP accelerator features, there are some core differences in how to operate the DAW with Apollo Solo versus most audio interfaces.

The companion Console application is used to control Apollo Solo's unique features. Understanding the interactions between Apollo Solo, Console, and the DAW will help you optimize workflows.

***Note:** To learn how to operate the DAW with basic audio interface functionality, consult the DAW documentation.*

## The DAW Environment

To get the most from your Apollo Solo system and LUNA Recording System, it will help to understand the core concepts and terms below, which are integral to digital audio workstation workflows. These terms are used when describing how to operate Apollo Solo and Console.

### Input Monitoring

Input Monitoring is the process of listening to live inputs, such as when an artist is performing with a musical instrument and/or vocals. When the artist has great input monitoring, they may deliver a more inspired performance.

Generally speaking, you'll want to use Console or LUNA for input monitoring when working with a DAW so you can take advantage of Apollo Solo's Realtime UAD Processing for great input sounds.

### Input Latency

Various sources of audio latency (time delay) are inherent in all digital audio systems. However, latency is normally only an issue when an artist is input monitoring their performance through headphones or speakers.

If what is heard in headphones arrives later than when the sound is produced, the performance may be compromised. Using Console or LUNA eliminates input latency when monitoring, tracking, and/or overdubbing with a DAW.

## I/O Buffering

I/O buffering is the shuttling of audio data back and forth between the DAW and the audio interface. The DAW's I/O buffer size setting determines the amount of input latency when *software monitoring* via the DAW. Smaller buffer sizes reduce latency, but increase CPU loading of the host computer. Lower buffer sizes do *not* increase UAD DSP loads.

Using Console or LUNA to control Apollo Solo's input *hardware monitoring* completely bypasses DAW I/O buffering, so there is no input latency, regardless of DAW's I/O buffer size setting.

**Note:** *LUNA Recording System manages I/O buffer settings automatically.*

## Software Input Monitoring

Software input monitoring refers to using the DAW's software mixer for monitoring live inputs instead of hardware input monitoring via the audio interface. Software input monitoring allows plug-ins (UAD or otherwise) loaded in a DAW to process live inputs, but the monitored signals are subject to the input latency caused by DAW I/O buffering.

**Note:** *The DAW's software input monitoring feature is enabled by default. To prevent doubled signals at Apollo Solo's outputs when software monitoring via the DAW, Apollo Solo's hardware monitoring must be disabled by muting Console's inputs.*

## Hardware Input Monitoring

Hardware input monitoring means an audio interface's inputs are routed directly to its outputs, which avoids discernible audio latency by eliminating DAW I/O buffering. Apollo Solo features low-latency hardware input monitoring via its internal digital mixer, which is controlled by Apollo Solo's companion Console or LUNA applications.

**Note:** *Apollo Solo's hardware input monitoring is active by default. To prevent signal doubling at Apollo Solo's outputs when hardware input monitoring via Apollo Solo's Console, the DAW's software input monitoring feature must be disabled.*

## Delay Compensation

Various sources of input and output latency are inherent in complex digital audio environments. However, when the DAW and Console are properly configured and operated, all time and phase alignment of all audio within a session is managed automatically by the DAW's delay compensation feature. See [Delay Compensation with Apollo Solo](#) and [Latency Basics](#) for more information.

# Setting the DAW to use Apollo Solo I/O

Apollo Solo's [Core Audio](#) and [ASIO](#) device drivers enable the device to be used as the audio interface hardware for any compatible Core Audio or ASIO DAW. After the DAW is set to use Apollo Solo as the audio interface hardware device, the DAW can directly access and route the audio signals at Apollo Solo's inputs and outputs.

## Specifying the Audio Interface Device

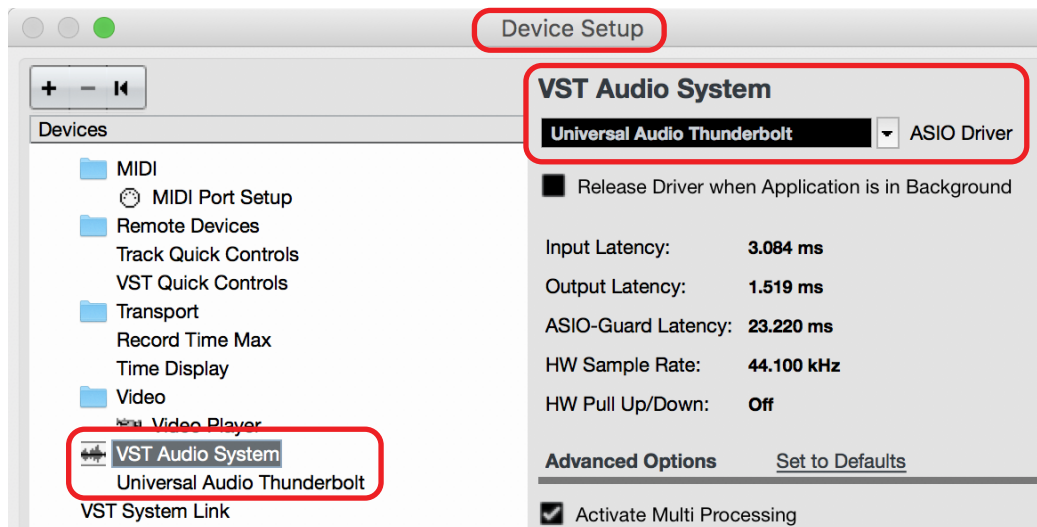
To set Apollo Solo as the DAW's audio interface, select Apollo Solo's device driver name as the audio device in the DAW's hardware setup preferences. The name of Apollo Solo's device driver is **Universal Audio Thunderbolt**.

The methods for specifying the audio interface hardware device, and the name of the setting, are different for each DAW. Examples of how to specify the audio interface within major DAWs are provided below. For more specific details, refer to the DAW documentation.

*Tip: For helpful videos that show how to setup popular DAWs with Apollo Solo, visit the UA Knowledge Base at [help.uaudio.com](http://help.uaudio.com).*

## Steinberg Cubase

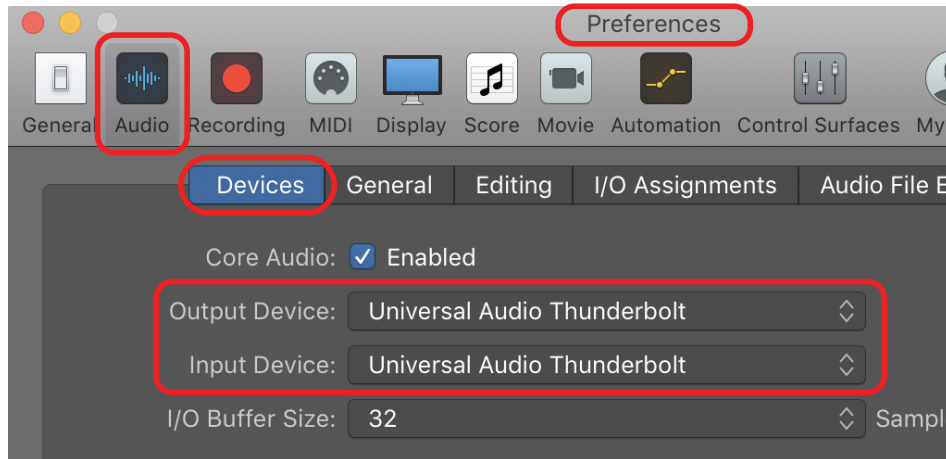
1. Open the Device Setup window.
2. Select VST Audio System in the Devices column (left side of window).
3. Locate the ASIO Driver menu under VST Audio System (right side of window).
4. Select **Universal Audio Thunderbolt** from the ASIO Driver drop menu.
5. Click Apply. Cubase is now set to use Apollo Solo I/O.



*Apollo Solo selected as the VST Audio System device in Cubase Device Setup*

## Apple Logic Pro X

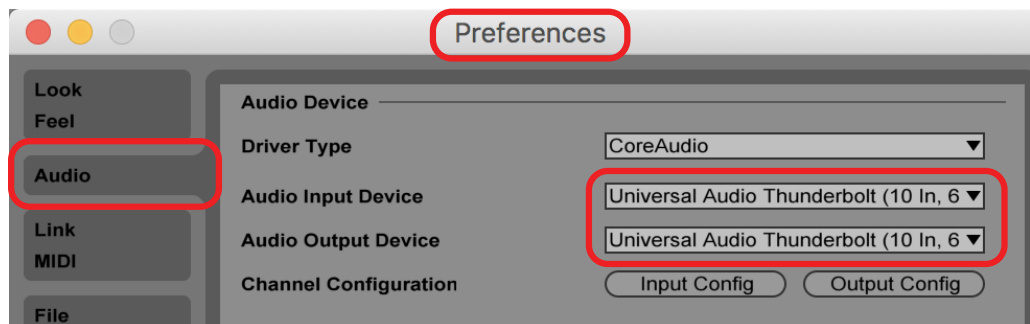
1. Open the Preferences > Audio > Devices window.
2. Select **Universal Audio Thunderbolt** from the Output Device and Input Device drop menus.
3. Click Apply Changes. Logic Pro is now set to use Apollo Solo I/O.



*Apollo Solo selected as the output and input device in Logic Pro preferences*

## Ableton Live

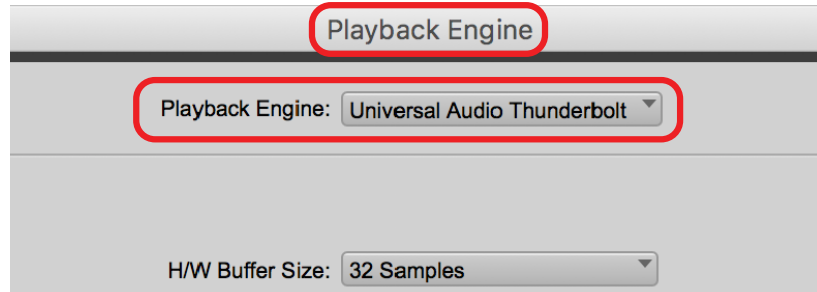
1. Open the Preferences window.
2. Select the Audio tab at left side of the Preferences window.
3. Select **Universal Audio Thunderbolt** from the Audio Input Device and Audio Output Device drop menus. Live is now set to use Apollo Solo I/O.



*Apollo Solo selected as the audio input and output device in Ableton Live preferences*

## Avid Pro Tools

1. Open the Setup > Playback Engine window.
2. Select **Universal Audio Thunderbolt** from the Playback Engine drop menu.
3. Click OK. Pro Tools is now set to use Apollo Solo I/O.



*Apollo Solo selected as the Playback Engine in Pro Tools*

## Universal Audio LUNA Recording System

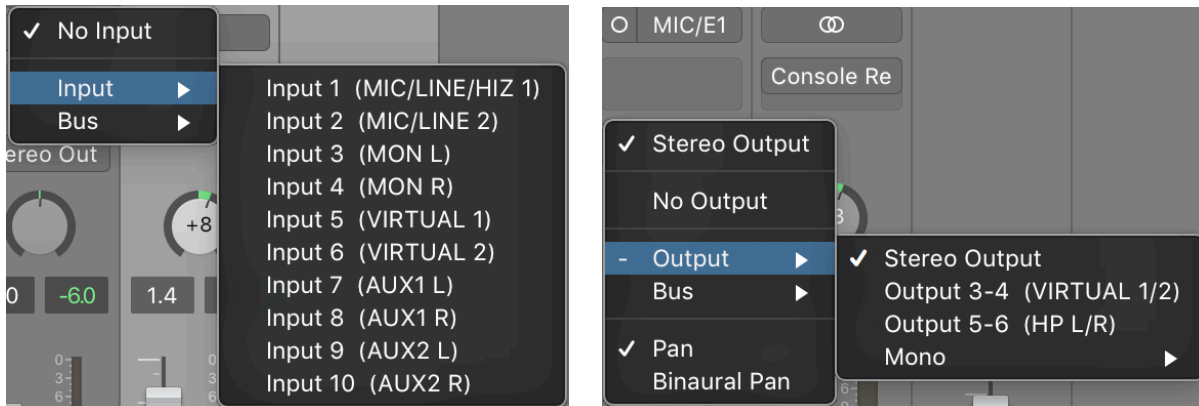
When LUNA is launched, Apollo is detected and configured automatically.

## Accessing Apollo Solo's I/O in the DAW

After [Setting the DAW to use Apollo Solo I/O/O](#), the DAW can access and route all of Apollo Solo's inputs and outputs directly.

### Selecting Apollo Solo's Inputs and Outputs

The methods for selecting channel inputs and outputs are different for each DAW. One example of how to choose I/O is shown below. For instructions, refer to the DAW documentation.



*Apollo Solo's inputs (left) and outputs (right) as they appear when selecting I/O in Logic Pro X*

### Available I/O

Apollo Solo's available inputs and outputs, along with their default channel names and numbers, are listed in the [Driver I/O Table](#).

Available I/O includes Apollo Solo's physical inputs and outputs, as well as its virtual inputs and outputs. Virtual I/O are software-only channels for digitally routing DAW audio into and out of Console. See [Virtual I/O](#) for more information.

**Tip:** *Apollo Solo's I/O routes and I/O channel names can be customized in the I/O Matrix panel within the Console Settings window.*

### Default Outputs

The main stereo outputs of a DAW usually output to channels 1 and 2 by default. Because channels 1 and 2 correspond to Apollo Solo's main outputs, the DAW's main outputs are sent to Apollo Solo's main outputs by default. The channels used for DAW output can usually be changed within the DAW settings.



## Apollo Solo I/O Driver Names

Each Apollo Solo input and output has a channel number and name provided by the Apollo Solo drivers to Core Audio and ASIO. Depending on the DAW (see Numbers versus Names below), these channel numbers and/or names are used when selecting and displaying Apollo Solo I/O.

## I/O Numbers versus Names

Apollo Solo's drivers describe all I/O channels by name and number, but what is actually displayed depends on each particular DAW. Names are not displayed by all DAWs (e.g., Ableton Live), or the driver name display mode can be changed within the DAW (e.g., Apple Logic Pro X).

All Apollo Solo driver default I/O numbers and names are listed in the [Driver I/O Table](#). These values can be used to reference specific Apollo Solo inputs or outputs by name when selecting I/O in an application that does not display the driver names.

***Tip:** Apollo Solo's I/O routes and I/O names can be customized in the [I/O Matrix Panel](#) within the Console Settings window.*

# Input Monitoring with the DAW

Input monitoring is the process of listening to live inputs, such as when an artist is performing with a musical instrument and/or vocals. When using Apollo Solo with a DAW, there are two ways to monitor inputs:

**Software Input Monitoring via DAW**– The DAW’s software mixer is used to control input monitoring and plug-in processing. Inputs are subject to DAW I/O buffering latency.

**Hardware Input Monitoring via Console or LUNA** – Console or LUNA is used to control Apollo Solo’s low-latency hardware input monitoring and Realtime UAD Processing. Inputs are routed directly to outputs, bypassing DAW I/O buffering latency.

## Use Software OR Hardware Input Monitoring

When monitoring live inputs, it’s important that only one input monitoring system is active. If software and hardware input monitoring are both active, the input signal(s) will be heard twice at Apollo Solo’s outputs — first from Console’s low-latency mix, and shortly thereafter from the DAW’s I/O buffered (higher latency) software mix. Doubled signals can cause undesirable “thin” sounds or other anomalies due to phase cancellations.

***Tip:** Use Console for hardware input monitoring to take advantage of Apollo Solo’s low-latency monitoring and Realtime UAD Processing features.*

## Disable Unused Input Monitoring System

By default, the DAW’s software input monitoring and Console’s hardware monitoring are both enabled. Therefore, one of the input monitoring systems must be manually disabled to prevent doubled signals at Apollo Solo’s outputs. Instructions are provided in following sections.

***Important:** To prevent doubled signals at Apollo Solo’s outputs when input monitoring via Apollo Solo’s Console, DAW software input monitoring must be disabled. Conversely, if DAW software input monitoring is enabled, Apollo Solo’s hardware input monitoring must be disabled by muting Console’s inputs.*

## How To Disable Software Input Monitoring

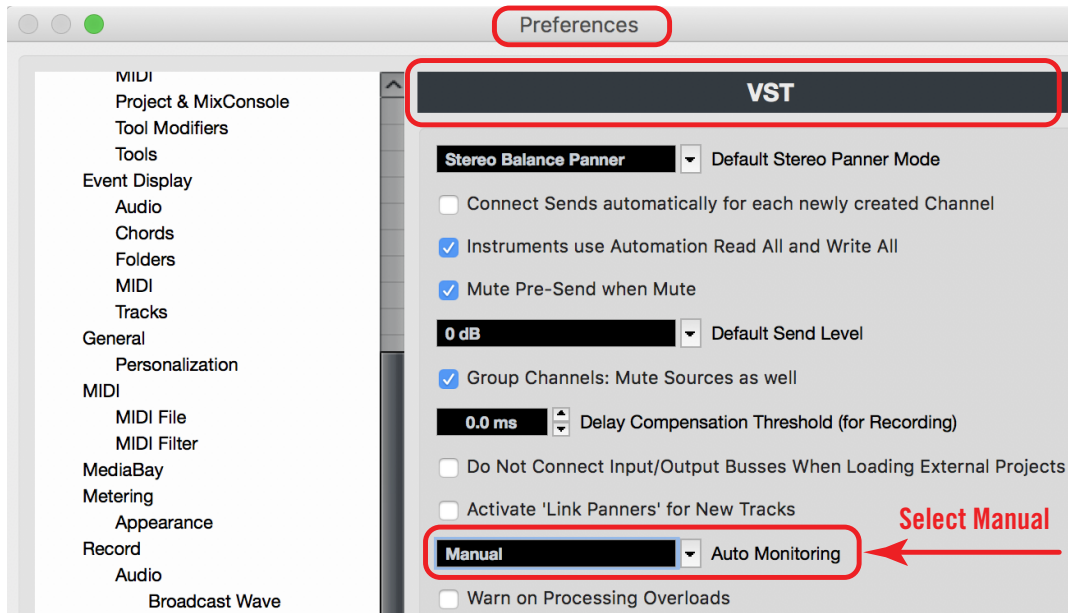
To prevent doubled signals at Apollo Solo’s outputs when hardware monitoring live inputs via Console, the DAW’s software input monitoring feature must be disabled. Note that DAW software input monitoring is usually enabled by default in the DAW’s settings.

The methods for disabling DAW software input monitoring, and the name of the setting, are different for each DAW. Examples of how to disable software input monitoring within major DAWs are provided below. For more specific details, refer to the DAW’s documentation.

***Note:** Some DAWs have multiple ways to disable software input monitoring.*

## Steinberg Cubase Auto Monitoring

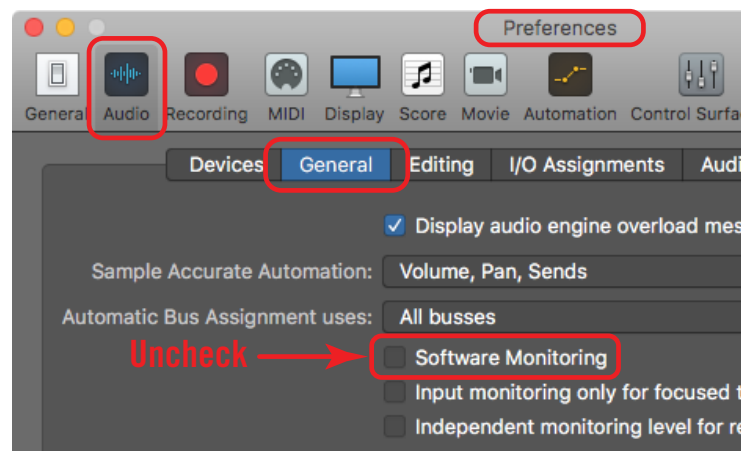
1. Open the Preferences window.
2. Click VST in the left column of the Preferences window.
3. Select Manual from the Auto Monitoring drop menu.



*Cubase: Set Auto Monitoring to Manual in VST preferences*

## Apple Logic Pro X Software Monitoring

1. Open Preferences > Audio > General.
2. Deselect (uncheck) the Software Monitoring option.



*Logic Pro X: Uncheck Software Monitoring in audio preferences*

## Ableton Live Monitor Mode

1. In the View menu, ensure the Mixer and In/Out options are checked so you can see the monitoring buttons. If in Arrangement View, unfold and resize the track to see the In/Out section.
2. Click the Off button in the Monitor section within the In/Out options. The button is orange when software monitoring is disabled.

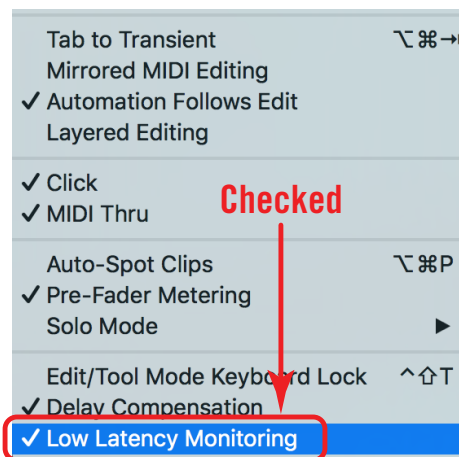
**Tip:** If multiple tracks are selected, pressing an Off button applies the selection to all selected tracks.



*Ableton Live: Set Monitor to Off in mixer In/Out section*

## Avid Pro Tools Low Latency Monitoring

1. Assign each track output to either Output 1 or Output 2 (mono), or both (stereo). Only tracks assigned to these outputs use Low Latency Monitoring.
2. Record enable audio track(s) by clicking their Record Enable buttons.
3. Select Options > Low Latency Monitoring. Software monitoring is disabled when Low Latency Monitoring is checked in the Options menu.



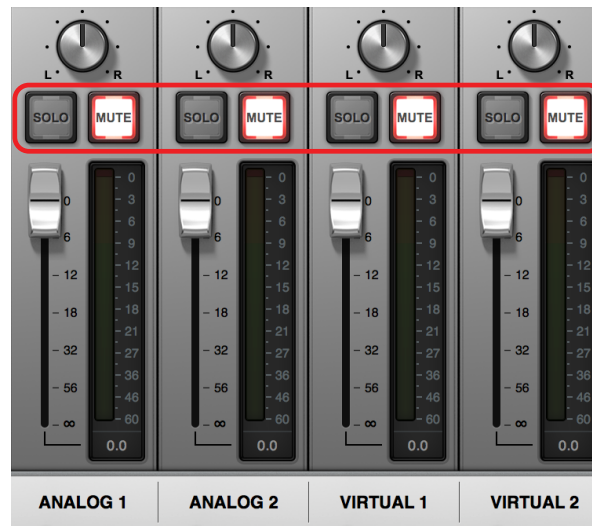
*Pro Tools: Low Latency Monitoring checked under Options menu*

## How To Disable Hardware Input Monitoring

To prevent doubled signals at Apollo Solo's outputs when software input monitoring via the DAW, Apollo Solo's hardware input monitoring feature via Console must be disabled. Note that Console input monitoring is enabled by default.

1. Open Console.
2. Mute input channels within Console by clicking the MUTE buttons so they are red.

*Tip: In Console, option-click any input MUTE switch to quickly toggle the mute state of all input channels.*



*Console: Mute inputs when software monitoring via DAW*

## Input Monitoring Tips

- Use Console for front-end hardware input monitoring to eliminate I/O buffering latency caused by DAW software monitoring — regardless of the DAW's buffer size setting.
- Prevent signal doubling at Apollo Solo's outputs by allowing only Console's hardware input monitoring **or** the DAW's software input monitoring feature — not both at the same time. Signal doubling can make input signals sound “thin” due to phase cancellations and/or comb filtering that occurs when two identical signals are mixed together and they are not phase-aligned.
- Route the DAW's main outputs into Console's virtual inputs via [Virtual I/O](#) when overdubbing so you can balance the levels of the DAW's pre-recorded tracks with Apollo Solo's live inputs — all within the Console mixer.
- If monitoring/recording a virtual software instrument in the DAW and you want to process the instrument with UAD plug-ins, route the output of the software instrument channel into Console's virtual input(s) and apply the UAD plug-ins in Console instead of the DAW. This technique reduces latencies caused by I/O buffering.

# Using Console with the DAW

The primary function of Console is the low-latency monitoring of Apollo Solo's inputs during live performance, either with or without Realtime UAD Processing. When used with a DAW, Console controls front-end monitor mixing and signal processing, replacing the DAW's software monitoring functions.

**Important Fundamental Concept:** *The primary function of Console is to control Apollo's low-latency hardware input monitoring, Unison plug-ins, and Realtime UAD Processing with third-party DAWs (such as Pro Tools or Cubase). Console or LUNA Recording System **must** be used to take advantage of these features.*

## Disable DAW Input Monitoring when Input Monitoring via Console

When using Console for low-latency input monitoring and recording with a DAW, the DAW's software input monitoring feature must be disabled to prevent doubled signals at Apollo Solo's outputs. See [How To Disable Software Input Monitoring](#) for details and methods.

## Disable Console Input Monitoring when Input Monitoring via DAW

When monitoring live inputs via the DAW's software monitoring feature, Console's inputs must be muted to prevent doubled signals at Apollo Solo's outputs. See [How To Disable Hardware Input Monitoring](#) for details and method.

## Controlling Apollo Solo's Unique Functions

Apollo Solo's unique Unison and Realtime UAD Processing features are controlled by the Console application. These are special functions that are available only when UAD plug-ins are inserted within Console. To activate these features, simply insert UAD plug-ins within Console. See [Console Plug-In Inserts](#) for details.

## Sharing UAD Resources

The UAD DSP resources that are available for UAD plug-in processing are shared between UAD plug-ins loaded within Console and UAD plug-ins loaded within the DAW.

To maximize UAD resources when monitoring and tracking live inputs, disable unused UAD plug-ins within the DAW. Conversely, when mixing, disable unused UAD plug-ins within Console.

**Note:** *For important related information, see [UAD Plug-Ins: Console versus DAW](#).*

## Saving Console Setups Within DAW

The Console Recall plug-in offers additional convenience when using Apollo Solo with a DAW. Console Recall is a utility plug-in that doesn't process audio. Instead, it stores Console's current configuration within the DAW project file. When the saved DAW project is subsequently opened, the complete Console configuration is restored.

The Console Recall plug-in also features Console monitor controls, enabling adjustments of level, mono, and mute without leaving the DAW. For details, see [Console Recall Plug-In](#).

## Routing and Recording Console I/O

### Recording Console Inputs

To record any Console input (physical or virtual), select the Console channel as the source for the DAW's audio channel(s). See [Accessing Apollo Solo's I/O in the DAW](#) for an example.

### Recording Console Outputs

Console's four stereo mix bus outputs (MON, HP, AUX 1, AUX 2) can be digitally routed into the DAW. This feature can be used, for example, to send Console's stereo monitor mix, stereo headphone cue mix, and/or stereo AUX processing into the DAW for recording.

To record Console outputs, select the outputs as the source for the DAW's audio channel(s). See [Accessing Apollo Solo's I/O in the DAW](#) for details.

### Route DAW Outputs Into Console

DAW output channel(s) can be digitally routed via software into Console's virtual input channel(s). With this feature, DAW outputs can be used for routing and processing within Console, just as if they were physical inputs.

The Virtual I/O feature can be used for the DAW's main stereo mix outputs, virtual instrument plug-in channels, or any other DAW output that can be assigned to hardware outputs.

To route DAW outputs into Console's virtual inputs, select the virtual *input* as the output route for the DAW's output channel(s). See [Virtual I/O](#) for details.

### Recording Realtime UAD Processing

When monitoring Apollo Solo's inputs with Realtime UAD Processing, those inputs can be recorded with processing (wet) or without processing (dry). This function is accomplished with the Insert Effects switch. See the [Insert Effects Overview](#) for details.

## DAW Mixdown and Console

Console has less utility when mixing prerecorded tracks in the DAW. Because the DAW tracks are already recorded, input latency and I/O buffering are never an issue during mixdown, so Console's input functions aren't needed.

Note that Console's configuration does not need to be changed when moving between tracking and mixdown. Console simply remains idle, ready to monitor and process those last-minute takes when inspiration strikes.

***Tip:** The Console application can remain open or closed at any time. Console plug-ins and routings remain active even when the application is closed.*

## UAD Plug-Ins: Console versus DAW

There are important fundamental differences between using UAD plug-ins within Console versus within a DAW. Apollo Solo features two distinct methods for using UAD plug-ins:

**Console processing (Realtime)** – Low-latency hardware input monitoring and recording with Realtime UAD Processing via UAD plug-ins that are loaded within Console.

**DAW processing (Buffered)** – DSP-accelerated processing via UAD plug-ins in VST, AAX 64, or Audio Units formats that are loaded within a DAW.

These two methods are not a switched mode, but instead simply depend on which host application, either Console or a DAW, contains the UAD plug-in(s). Note that both methods can be used at the same time for maximum flexibility. Each method is explained in greater detail below.

### UAD Processing in Console (Realtime)

UAD plug-ins run in realtime, without discernible latency, only when used within Console. Hardware input monitoring with Realtime UAD Processing via Console is optimum for artists and engineers that need to monitor and capture performances without DAW I/O buffering latency and its associated hindrances.

**Important:** *UAD plug-ins used within Console only run on the DSP within Apollo Solo. If UAD-2 DSP accelerators are active in the same system, the DSP on those devices cannot be used to process UAD plug-ins in Console.*

The special Realtime UAD Processing functionality is achieved via Apollo Solo's unique ultra-low latency DSP+FPGA+Console design. Although every audio interface has undetectable latency that is inherent to the A/D–D/A process, routing Apollo Solo's input signals through UAD plug-ins within Console *does not add to this inherent latency*.

Up to five UAD plug-in instances can be inserted serially (aka, stacked or chained) on each of Console's inputs and/or auxiliary buses at the same time, without adding to the inherent A/D–D/A latency.

Console inputs and stereo mix buses (monitor, headphone, auxiliary), with or without Realtime UAD Processing, are routed into the DAW via Apollo Solo's device drivers. These channels can be optionally recorded as either processed (wet) or unprocessed (dry) audio using the Insert Effects feature in Console (see [Insert Effects Overview](#)).

### Console Processing Notes

- Console controls Apollo Solo's Unison and Realtime UAD Processing features. These are special functions that are available only when UAD plug-ins are inserted within Console. To activate these features, simply insert UAD plug-ins within Console.
- As with all UAD devices, Apollo Solo can only load UAD plug-ins, which are specifically designed to run on UAD DSP. Host CPU-based (native) plug-ins cannot run on UAD DSP or be inserted in Console.
- Upsampled UAD plug-ins add negligible latency (usually indiscernible) when used within Console or a DAW. See [Latency Basics](#) for more information.



## UAD Processing in DAW (Buffered)

When UAD plug-ins are used within compatible VST, AAX 64, or Audio Units host DAW applications (i.e., outside of Console), monitored input signals are subject to I/O buffering latency because the data must be shuttled back and forth between the DAW and the audio interface.

The amount of input latency depends on the I/O buffer size setting (including when plug-ins are *not* used, UAD or otherwise). As the buffer size is increased, more input latency is induced. At lower buffer sizes, input latency is reduced but the host computer's CPU loads increase. With larger buffer sizes, input buffering latency makes software monitoring via the DAW mixer while recording live inputs less practical — if the sound is heard noticeably later than it is produced, it can compromise the performance.

Note that latency is not an issue during mixdown in a DAW because the performances are already captured. The benefits of using Apollo Solo's integrated DSP acceleration when mixing with UAD plug-ins in the DAW include the off-loading of plug-in processing from the host computer's CPU, and the sonic rewards of UAD plug-ins.

### DAW Processing Notes

- UAD plug-ins within a DAW are heard only when Apollo Solo and/or UAD-2 DSP accelerators are active in the system. UAD plug-ins can be loaded in a DAW when UAD DSP is unavailable, but they will not process audio.
- When monitoring or recording Apollo Solo's inputs in a DAW, eliminate I/O buffering latency by using Console for hardware input monitoring and Realtime UAD Processing.

## UAD Processing in both Console and DAW

UAD plug-ins can be used within Console and a DAW at the same time. In this scenario, Apollo Solo's UAD DSP resources are shared between the two host applications. Realtime UAD Processing is available via Console, and I/O buffered (non-realtime) UAD processing is available via VST, AAX 64, or Audio Units plug-ins in the DAW.

***Note:** UAD plug-ins within a DAW can also run at the same time as native (host CPU based) plug-ins, in any combination.*

### Bypass UAD plug-ins within DAW when monitoring with Console

To maximize available DSP resources for UAD plug-in processing within Console when monitoring, power off or unload UAD plug-ins in the DAW.

### Bypass Console plug-ins when mixing in DAW

To maximize available DSP resources for UAD plug-in processing within the DAW when mixing, power off or unload the UAD plug-ins in Console.

***Tip:** Use the “Disable All” feature within Console (see [Channel Options](#)) to quickly disable/enable all UAD plug-ins within Console.*

## Virtual I/O

Apollo Solo's device drivers carry various *virtual* (software only) input and output channels in addition to its physical hardware inputs and outputs. Virtual I/O enables digital routing of DAW signals back and forth between Console. The virtual channels consist of Console's virtual inputs, Console's virtual outputs, and all of Console's MON, HP, and AUX mix bus outputs.

### Flexible, Pristine Signal Routing

Virtual I/O facilitates highly flexible signal routing via the DAW, without needing to reach behind gear for manual cable patching. Additionally, because the virtual I/O channel audio streams are in the digital domain, a pristine audio signal path is maintained by not requiring additional A/D–D/A conversions.

### Virtual Inputs into Console

The virtual input channels enable any DAW output to be routed directly into Console's virtual inputs so Realtime UAD Processing can be applied to the DAW signal(s).

*Tip: This feature is particularly useful when performing live with virtual software instruments inserted in the DAW, because the throughput latency associated with I/O buffering is reduced in this configuration.*

### Virtual Outputs into DAW

Virtual outputs enable any (or all) of Console's virtual input channels, and the stereo MON, HP, and AUX mix bus outputs, to be directly routed to any DAW input so they can be recorded. With virtual outputs, it's easy to capture Console signals, with or without Realtime UAD Processing.



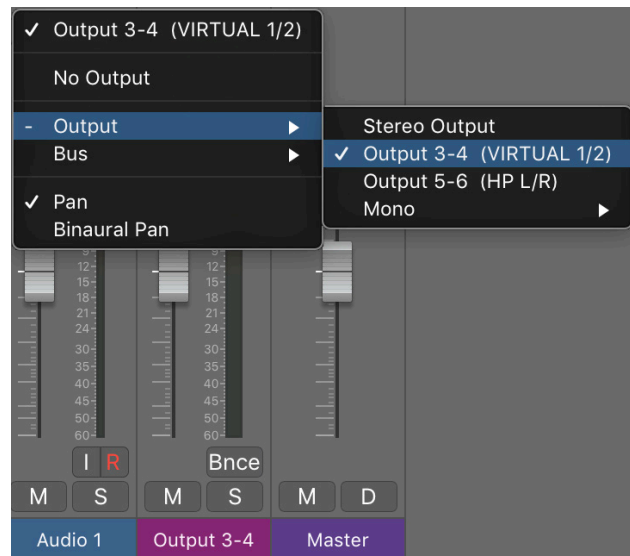
*Pro Tools screen shots showing signals being digitally routed from the DAW into Console for monitoring and/or Realtime UAD Processing (left) and from Console into the DAW for recording and/or further processing (right)*

## Routing DAW Outputs to Console Inputs

To route a DAW output signal into Console for monitoring and/ Realtime UAD Processing, assign any Console virtual channel (or channel pair, when the DAW source is stereo) as the output device for any DAW track, bus, or output.

That DAW output signal then appears in the associated virtual input channel(s) in Console, and it can be processed or routed the same as Apollo Solo's hardware inputs.

*At Right: A stereo DAW channel's outputs assigned to Console's virtual inputs*



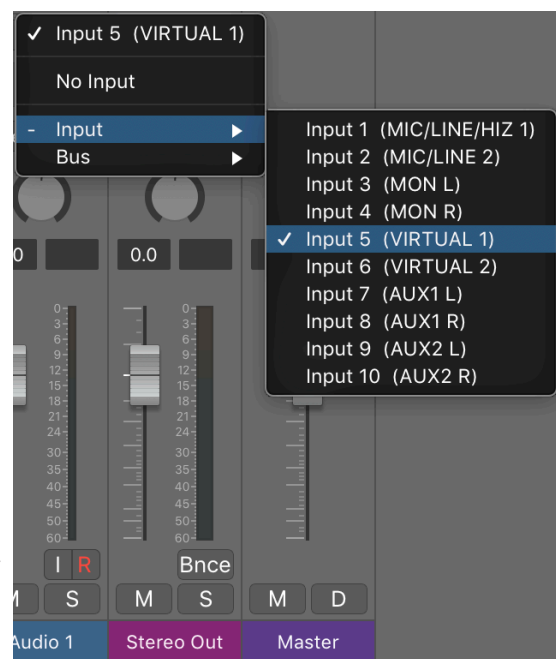
## Routing Console Outputs to DAW Inputs

To route a Console output signal into the DAW so it can be recorded, assign any Console virtual channel (or channel pair, when the Console source is stereo) as the input source for any DAW input.

That Console signal can then be recorded or routed by the DAW as if it were a hardware input.

**Tip:** This technique can be used to re-capture and record (bounce) a software instrument performance that was virtually routed from the DAW into Console for Realtime UAD Processing.

*At right: Console's virtual outputs assigned to a DAW channel's input. Note that any output listed here (including Console's stereo MON, HP, and AUX mix buses) can be used for DAW input.*



## Virtual I/O Examples

### Adjust DAW Levels Within Console

By default, the DAW's main stereo outputs (the playback mix) is routed to Apollo Solo's main outputs and blended with Console's inputs, and the DAW playback level is adjusted with the DAW's outputs controls.

By digitally routing the DAW playback mix into Console's virtual input(s) with Virtual I/O, the DAW playback level can be adjusted with Console's virtual input faders. This is particularly useful when overdubbing — you can balance the DAW playback level along with the live input levels without leaving Console.

### Reduce UAD Processing Latency on Virtual Instruments

When playing a virtual software instrument plug-in via the DAW, the monitored performance is subject to I/O buffering latency. If the live instrument is processed by a UAD plug-in in the DAW, latency is further increased due to additional buffering to and from Apollo Solo's DSP.

By digitally routing the live software instrument channel into Console's virtual input(s) with Virtual I/O, the UAD plug-in(s) can be used inside Console for Realtime UAD Processing instead of the DAW's buffered UAD plug-in processing. This setup reduces monitored input latency by more than half.

# Using Apollo Solo for System Sound I/O

Apollo Solo's I/O can be used for the computer's system sound audio. System sound audio I/O is used by music players, web browsers, system software alert sounds, and similar applications — essentially, any audio application that doesn't access Apollo Solo's [Core Audio](#) or [ASIO](#) drivers directly.

If an audio application doesn't have its own setting for accessing an I/O device directly, it uses the device specified within the Sound control panel in the operating system. When Apollo Solo is set as the audio I/O device in the OS, any audio software that uses system sound will use Apollo Solo for I/O.

**Important:** *To prevent system sounds from being inadvertently routed into Apollo Solo's outputs and/or DAW recordings, setting Apollo Solo as the output device for system sounds is generally not recommended when using a DAW.*

## System Sound Routing

When the OS is set to use Apollo Solo for system sound I/O, audio levels are controlled by the audio application, Apollo Solo, or both, as described below.

### System Sound Output

Audio from the application is routed to Apollo Solo's main outputs and mixed with Apollo Solo's input signals. The application's audio level is controlled from within the audio application, while Apollo Solo's input levels are controlled within Console.

**Note:** *To adjust the level of system audio at Apollo Solo's outputs, use the output level control within the audio application.*

### System Sound Input

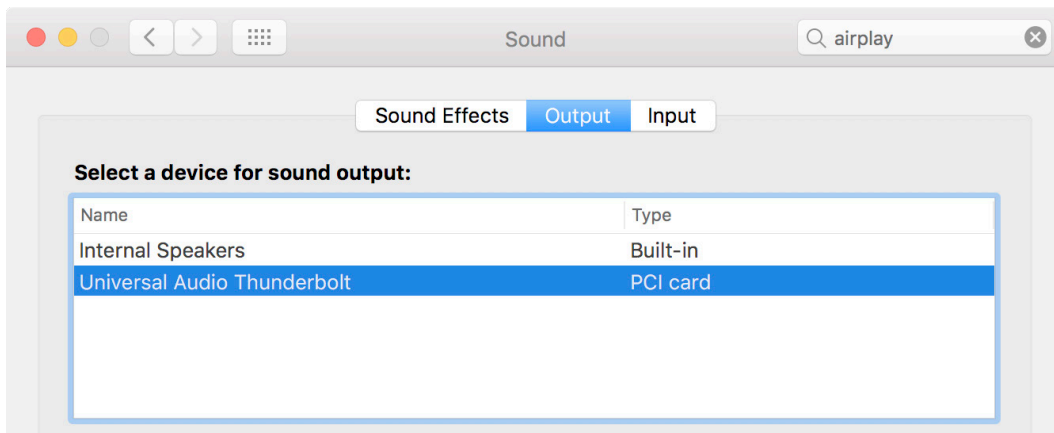
The level of Apollo Solo's input signals being routed into the audio application are adjusted with the preamp controls — and UAD plug-ins, if any — in Console. In this scenario, Console's input faders don't control levels routed to the audio application. Signals routed to audio applications are always pre-fader (Console's input faders control monitoring levels only, not recording levels).

**Tip:** *It's usually best to keep Console metering set to pre-fader (in Console Settings>Display Panel) so the input meters accurately represent the signal level at the audio application's inputs.*

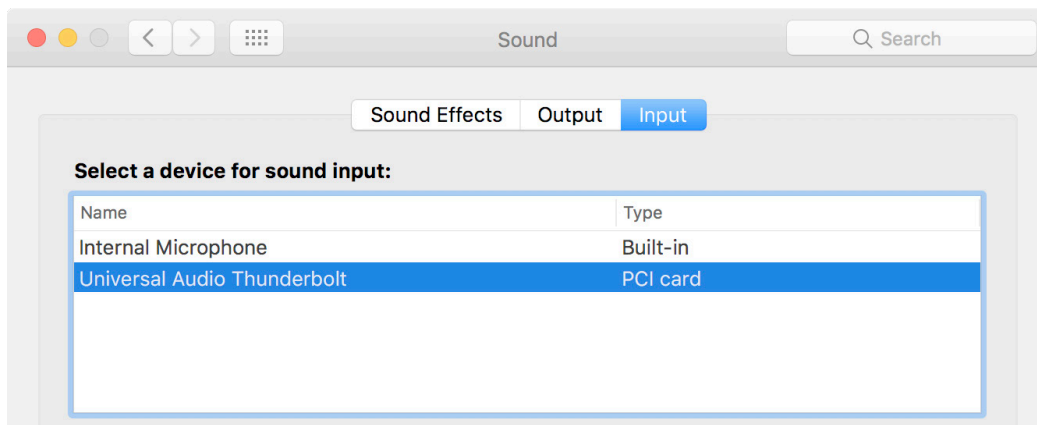
## Setting System Sound I/O (Mac)

*To use Apollo Solo I/O for system sound:*

1. Open macOS System Preferences > Sounds.
2. In the Output panel, select **Universal Audio Thunderbolt**.
3. In the Input panel, select **Universal Audio Thunderbolt**.



*Apollo Solo selected for system sound output in macOS System Preferences*



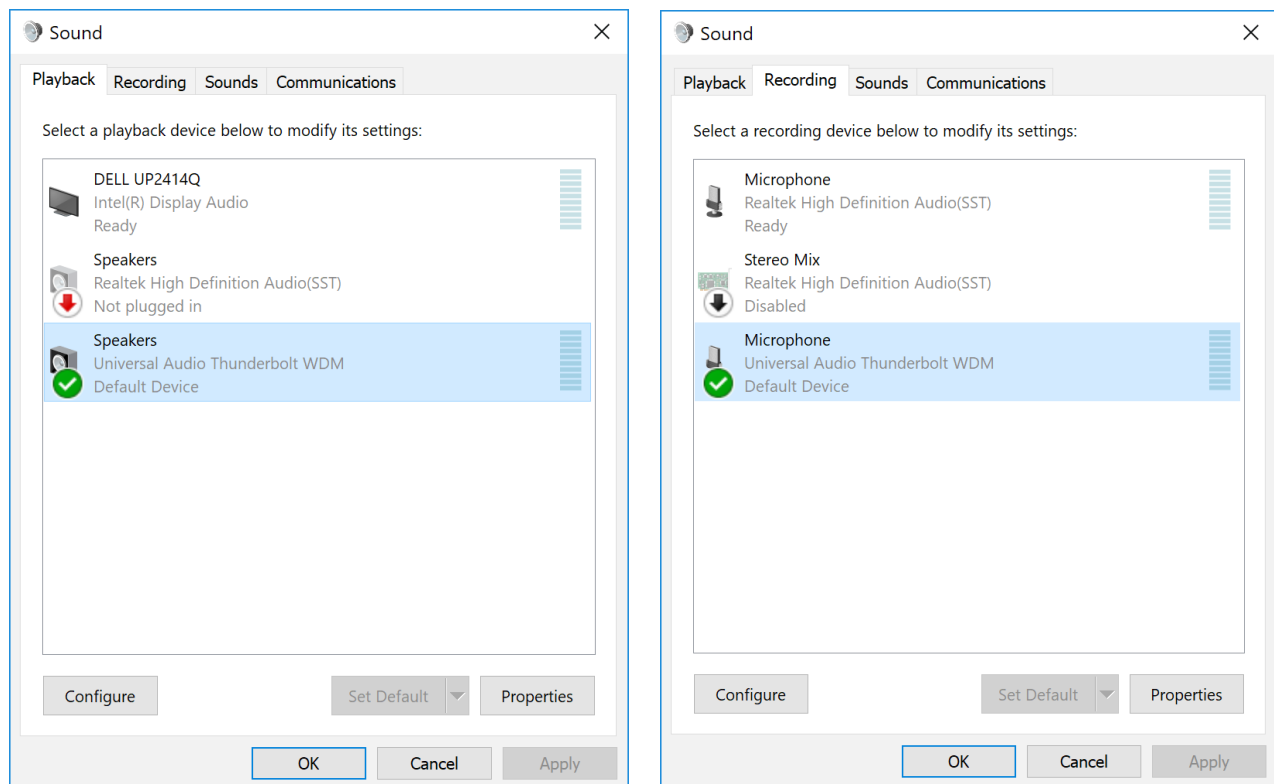
*Apollo Solo selected for system sound input in macOS System Preferences*

## Setting System Sound I/O (Windows)

*To use Apollo Solo I/O for system sound:*

1. Open Windows Control Panel > Sounds.
2. In the Playback tab, select **Universal Audio Thunderbolt WDM**. Click Apply, then click Set Default.
3. In the Recording tab, select **Universal Audio Thunderbolt WDM**. Click Apply, then click Set Default.

**Important:** See [Windows WDM System Sound Notes](#) for important information when using Apollo Solo for system sound I/O.



*Apollo Solo selected for WDM system audio output (left) and input (right) in the Sound control panel*

## Windows ASIO versus WDM

On Windows systems, ASIO and WDM are different subsystems that are configured and operated separately. ASIO is typically used for DAW setups, while WDM is typically used for system sound I/O.

ASIO system settings are configured in the Apollo Solo Console Settings>Hardware panel and within the DAW preferences. WDM system settings are configured in the Sound control panel within the Windows OS.

**Important:** When using Apollo Solo for WDM system sound I/O, the sample rate of both subsystems must be set the same rate to be heard in both subsystems. See [Windows WDM System Sound Notes](#) for related information.

## Windows WDM System Sound Notes

Windows WDM system audio is used for audio input and playback in media players, web browsers, audio conference, and similar programs.

To ensure proper audio system functionality, follow these guidelines when using Apollo Solo as the input and/or output device for Windows WDM system audio.

- **Disable system notification sounds.** Turn off all Windows system alert sounds using the procedure detailed on the previous page.
- **ASIO and WDM sample rates must match.** All sample rate values in ASIO DAW programs and WDM audio programs must be set to the same sample rate. If the ASIO and WDM sample rates are not the same, audio from one or more programs will not be heard correctly.
- **WDM sample rate changes.** Set the sample rate in Apollo Solo's Console **before** changing sample rates in the Sound>Playback or Sound>Recording control panels within Windows. Note that WDM programs may need to be closed then reopened to be heard correctly if the sample rate is changed in the Sound control panel within Windows.
- **DAW sample rate changes.** If the DAW sample rate is changed, WDM audio will no longer be heard correctly because the sample rates no longer match. In this case, the WDM sample rate must be changed in the Windows Sound>Playback panel to match the DAW sample rate.

### Additional Windows Optimizations

- Visit the Apollo Solo Knowledge Base at [help.uaudio.com](https://help.uaudio.com) for updated technical news and system optimization information.

## Using Apollo Solo Without Audio Software

Apollo Solo and Console can be used without a DAW or any other audio software. For example, Apollo Solo can be used as a signal processor for live performance when a DAW's recording and playback features are not needed. In this scenario, Console controls Apollo Solo's digital mixing, monitoring, and Realtime UAD Processing features.

To use Console by itself for input monitoring and Realtime UAD Processing, there aren't any special considerations — simply launch Console and start using it.

***Note:** Because Apollo Solo is powered by the computer's Thunderbolt 3 bus, standalone use without a computer is not possible. Apollo Solo can only be used when connected to a Thunderbolt 3 computer.*



# Console Overview

## What is Console?

The included Console application is the companion software interface for the Apollo Solo audio interface hardware. Console's analog-style workflow is designed to provide quick access to the most commonly needed features in a familiar, easy-to-use application.

Console's function is to control the Apollo Solo hardware unit and its digital mixing and low-latency monitoring capabilities. Console is where Realtime UAD Processing and Unison UAD plug-ins are configured and operated.

**Important Fundamental Concept:** *The primary function of Console is to control Apollo's low-latency hardware input monitoring, Unison plug-ins, and Realtime UAD Processing with third-party DAWs (such as Pro Tools or Cubase). Console or LUNA Recording System **must** be used to take advantage of these features.*

Console remotely controls the digital mixing and signal processing functions that are performed within the Apollo Solo hardware. Although Console runs on the host computer, the computer's CPU is not performing these audio functions. All audio mixing and signal processing occurs on the SHARC DSP inside the hardware unit.

Console can be used at the same time as a DAW for front-end signal processing and low-latency monitoring and/or tracking. Complete Console sessions can be saved as presets for easy recall of the entire configuration, or individual channel strips can be save and recalled using Channel Strip Presets. Console can also be used to configure Apollo Solo's audio interface I/O settings such as sample rate, clock source, and reference levels.

**Note:** *Apollo Solo interfaces use UAD DSP and memory resources for its internal DSP mixer. Therefore, the UAD Meters will show DSP and memory usage when Apollo Solo is connected, even if Console and/or UAD plug-ins are not currently loaded.*



*Console's application icon and main window*

## Console Functions

Console enables the following functionality when used with Apollo Solo:

- **Hardware control.** All of Apollo Solo's front panel hardware controls (except headphone volume) can be software controlled using Console, facilitating easy hardware manipulation even if Apollo Solo is placed out of reach of the computer operator.
- **Low-latency monitoring.** Using Console eliminates the latency associated with DAW I/O buffering that makes monitoring problematic for the performer. By removing the DAW's software input monitoring feature from the monitoring signal flow altogether, the need to adjust I/O buffer sizes and latency is no longer an issue.
- **Realtime UAD Processing.** UAD Powered Plug-Ins can be inserted into all Console inputs and/or auxiliary returns (within available DSP resources), for the ultimate latency-free sonic experience while monitoring and/or tracking live performance. All processed (or unprocessed) inputs and stereo mix buses, including the monitor, auxiliary, and headphone buses, can be optionally routed into the DAW for recording.
- **Unison.** Apollo Solo's Unison™ technology gives you the tone of the world's most sought-after tube and solid state mic preamps, guitar amps, and pedals — including their all-important impedance, gain stage “sweet spots,” and component-level circuit behaviors.
- **Send/Return auxiliary buses.** Console has two stereo aux buses, with independent send levels per input, for grouped signal processing (conserving UAD DSP resources) or routing to the DAW.
- **Flexible cue monitor mixing.** A separate stereo headphone cue mix bus is available with per-input sends to ensure performers are able to hear “more me” if desired.
- **Session management.** Complete Console configurations can be saved and loaded to/from disk as presets, for convenient and unlimited session management. Console sessions can also be stored/recalled within the DAW project using the Console Recall plug-in.

## Global Functions

Parameters within [Console Settings](#) are available for configuring various global behaviors:

- **Hardware.** Global interface settings such as sample rate and reference levels.
- **Software.** Global software settings for Console such as metering and plug-in window behaviors.
- **I/O Matrix.** This powerful feature enables customized signal routing and I/O naming at the Core Audio (Mac) and ASIO (Windows) driver level. Custom driver routing tables can be saved and recalled as presets.

## When To Use Console

Console can be used without a DAW, simultaneously in conjunction with a DAW, or not at all. These scenarios are covered in greater detail in [Working With Apollo Solo](#).

**Note:** *Console processing is always active, even after the application is quit. Console can be launched or quit at any time, whether or not a DAW is already running.*

**Console without DAW.** Console can be used by itself without the use of a DAW or any other audio software. Using Console without a DAW provides access to all Apollo Solo functionality and simplifies the use of Apollo Solo's digital mixing, monitoring, and Realtime UAD Processing features when a DAW's recording and playback features are not needed.

**Console with DAW.** Console is used at the same time as a DAW when low-latency monitoring and/or recording of Apollo Solo's inputs with (or without) Realtime UAD Processing is desired. In this scenario, Console is used as a front end to control input monitoring when recording, and the DAW's software input monitoring feature is disabled. This workflow completely eliminates the I/O buffering latencies associated with using software monitoring via the DAW.

**Important:** *To eliminate doubled signals, software monitoring in the DAW must be disabled when Console is used for input monitoring. Conversely, Console inputs must be muted if the DAW's software monitoring feature is enabled.*

UAD plug-ins can be used within Console and a DAW at the same time. In this scenario, Apollo Solo's DSP resources are shared between the two host applications. Realtime UAD Processing is available via Console, and buffered (non-realtime) UAD processing is available via VST, AAX 64, or Audio Units plug-ins in the DAW. See [UAD Plug-Ins: Console versus DAW](#) for more details about this workflow.

## Interactions Between Console and Apollo Solo

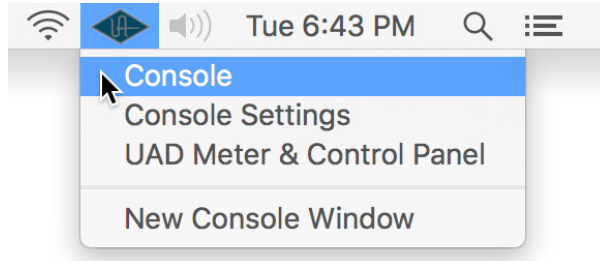
Console's settings mirror the Apollo Solo hardware. Changes made to one are also made on the other, and vice versa. If changes are made to Console when Apollo Solo is not connected, and then Apollo Solo is subsequently connected, the Console settings are sent to the hardware.

# Accessing Console

Any of the methods below can be used to open the Console application.

## Mac

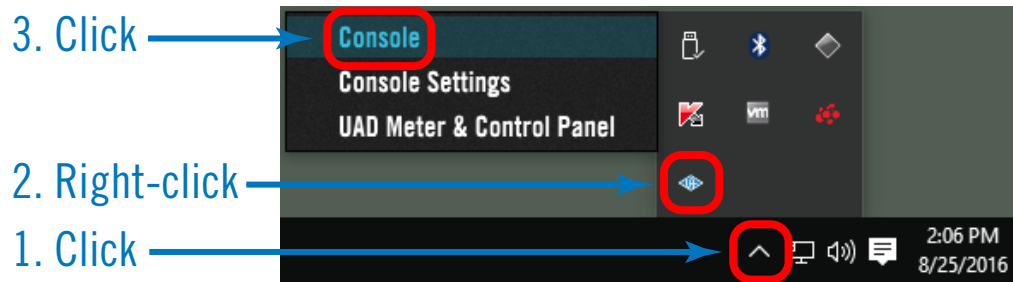
- Click the Console application icon in the macOS Dock
- Select Console from the drop menu after clicking the blue UA logo diamond in the macOS Menu Bar (at upper right of screen)



*Accessing Console from the macOS Menu Bar*

## Windows

- Access the program from the Windows Start Menu
- Right-click the blue UA diamond logo in the Windows System Tray (in taskbar at lower right of screen), then select Console from its contextual menu



*Accessing Console from the Windows System Tray*

# Quitting Console

Console can be closed using any of these methods:

## Mac

- Select Quit from the macOS Application Menu (upper left of screen) when Console is the foreground application
- Use the standard macOS keyboard shortcut (Command+Q)
- Close all Console windows (main Console window and Console Settings window) by clicking the Close (X) button in the [Window Title Bar](#)

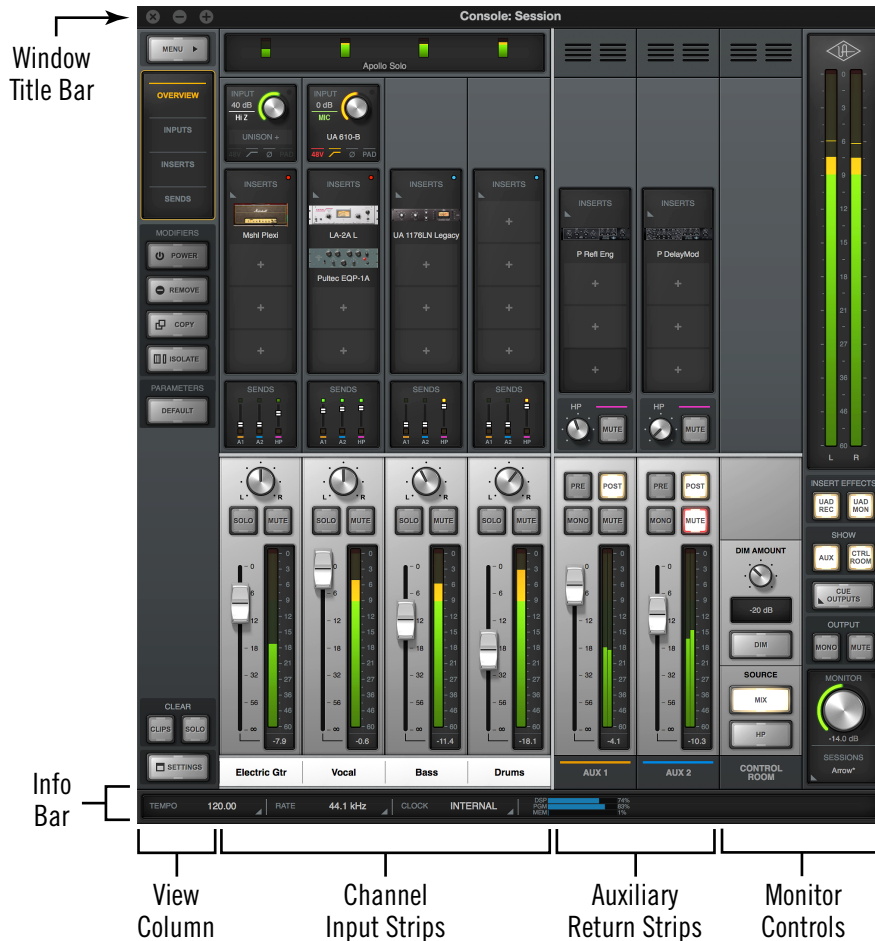
## Windows

- Close all Console windows (main Console window and Console Settings window) by clicking the Close (X) button in the [Window Title Bar](#)

# Console Layout

Console's visual and control elements are grouped according to functionality, with a layout similar to that found on typical analog mixers. These groups are illustrated below.

Detailed explanations of all the Console control functions are similarly grouped and presented later in the [Console Reference](#) chapter.



*Console's main window and controls layout*

## Dynamic Window Size

The size of Console's window can be dynamically adjusted to fit any workspace. To adjust the window size, click+drag any corner or edge of the window.

### Width

Reducing the Console window width may reduce the number of visible input channels. Use the [Bank Bar](#) in the [Meter Bridge](#) to view input channels that may be currently out of view.

### Height

When Console's window size is vertically adjusted, displayed elements are dynamically modified to fit available space. As the height is increased, some elements are enlarged for easier viewing and manipulation. As height is decreased, some elements are reduced to fit in the available space.

**Note:** All display and control elements are always available regardless of window size.



*Drag any corner or edge to dynamically re-size the Console window*



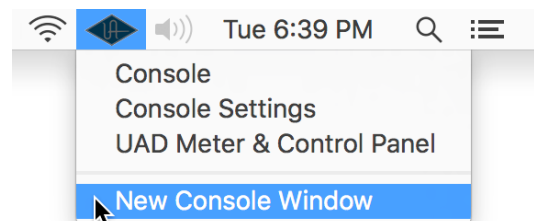
*Partial screenshots showing how control and display elements are changed with window size adjustments.*

*Above: The elements shown at left are more compact when vertical size is reduced.*

## Multiple Windows (Mac only)

On Mac systems, more than one Console window can be open at the same time, and each open window can have unique views and sizes.

To open another window, choose New Console Window from the drop menu under the UA icon in the macOS Menu Bar at upper right of screen.



*Opening an additional Console window on Mac*

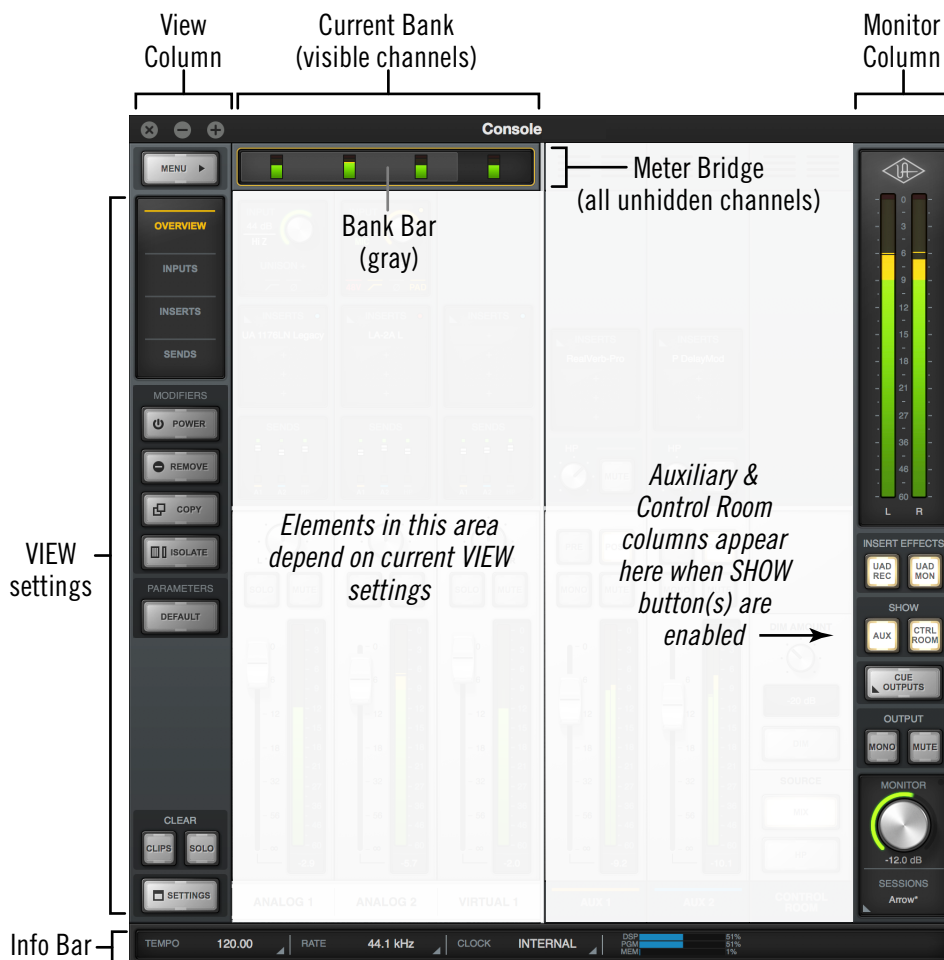
# Global Window Elements

Some visual and control elements are always displayed in the Console window, while others depend on the current selection(s) in the *View Column* and *Monitor Column*, as illustrated below.

An brief overview of each global element is provided in this chapter. Detailed descriptions of all functions are provided in a later chapter.

The following elements are always visible in the Console window:

View Column	Meter Bridge
Monitor Column	Current Bank
Info Bar	Bank Bar (if channels out of view)

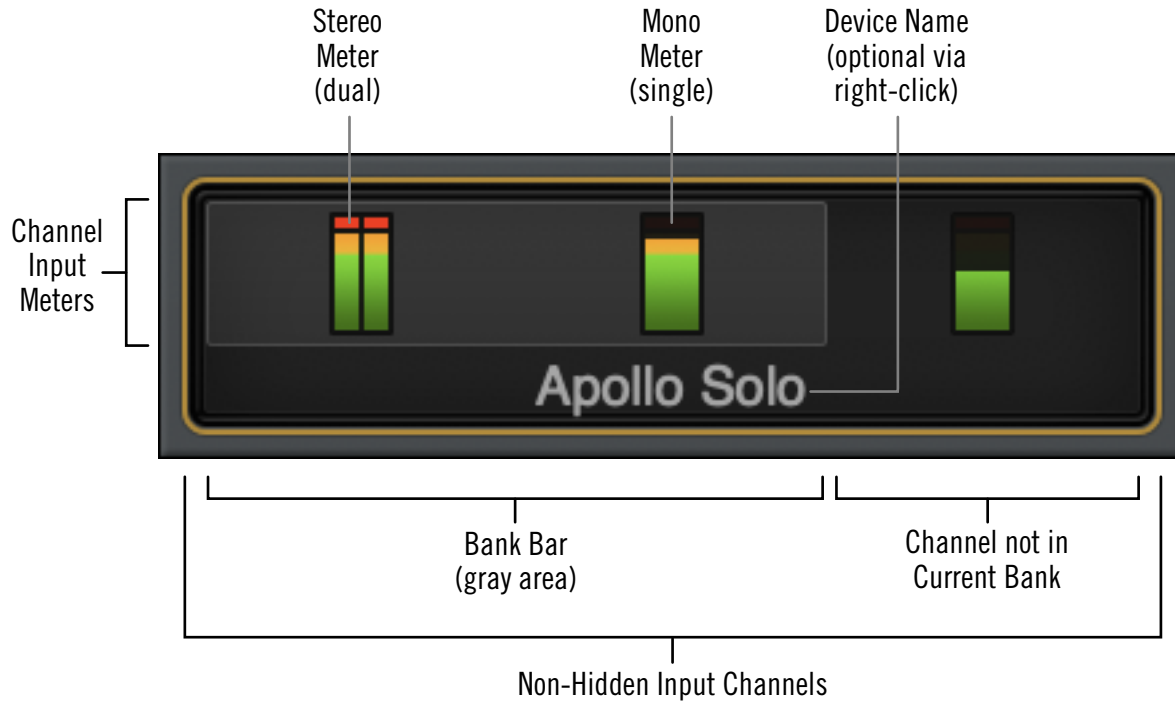


*Console elements that are always visible*

## Meter Bridge Overview

The Meter Bridge (illustrated below) is always visible at the top of the Console window. It displays all non-hidden input channels (those that are not hidden with the Show/Hide Inputs feature), signal activity at these inputs, and the *Bank Bar*, which is used to scroll inputs that are out of horizontal view.

For detailed descriptions of all Meter Bridge elements, see [Meter Bridge](#).



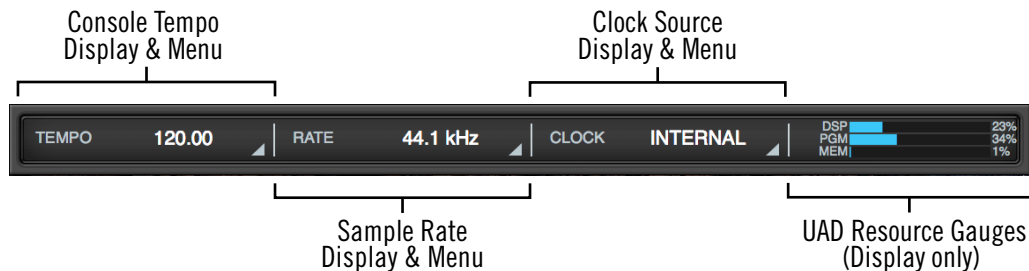
*Meter Bridge elements*



## Info Bar Overview

The Info Bar (illustrated below) is always visible at the bottom of the Console window. It displays and provides access to several important functions.

**Note:** For detailed descriptions, see [Info Bar](#).



Info Bar elements

### Tempo

Console's current tempo is displayed here in beats per minute (BPM). The value is used by UAD plug-ins within Console that are set to use Tempo Sync. Click this area to enter or tap a different tempo.

### Sample Rate

Apollo Solo's current sample rate is displayed here. Click this area to select a different sample rate from the drop menu when using Console without a DAW.

**Note:** When using a DAW, the sample rate is managed within the DAW.

### UAD Resource Gauges

This area displays DSP and memory resource loads used by all loaded UAD plug-ins (within both Console and DAW). UAD loads can be monitored as needed, for example when deciding which UAD plug-ins to load, based upon how much DSP is available.

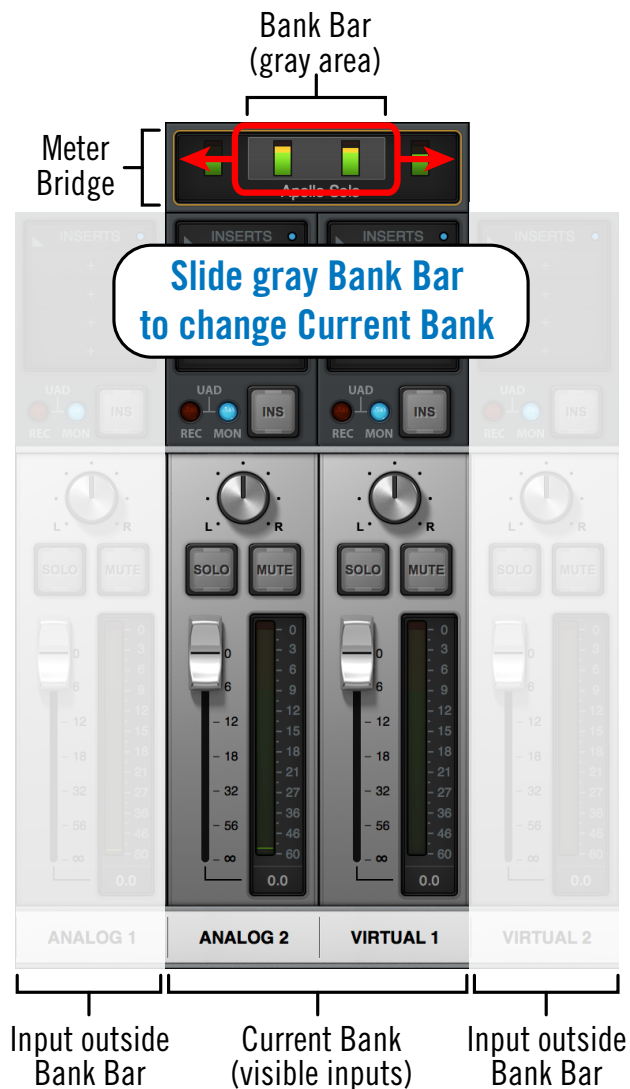
Values displayed here are mirrored in the UAD Meter & Control Panel application. More detailed (per-SHARC) display of DSP usage is available in the System panel within the UAD Meter & Control Panel application.

## Current Bank Overview

An important navigational concept in Console is the *Current Bank*. The Current Bank is all input channels that are currently visible in the main body of the Console window (below the Meter Bridge) as shown in the illustration below. Sliding the gray Bank Bar changes the Current Bank so the other inputs can be seen.

**Note:** The Bank Bar only appears when the Console window is too nApollo Solo to display all input channels.

This feature is especially useful when the system is expanded with additional I/O by connecting one or more Universal Audio Apollo interfaces. For complete details, see [Current Bank](#).



*Conceptual illustration of the Current Bank. In this example, inputs Analog 2 and Virtual 1 are in the Current Bank, while Analog 1 and Virtual 2 are not visible. Sliding the Bank Bar brings the other inputs into view.*

# View Column Overview

The View Column (illustrated at right) is always visible at the left side of the Console window. The View Column contains the Application Menu, View selectors, View Options, Clear switches, and Settings switch, as shown at right.

For detailed descriptions, see [View Column](#).

## Views

Four Views are available in Console: Overview, Inputs, Inserts, and Sends. Each View displays related elements and associated functionality in the main area of the Console window.

## View Selectors

Any of these methods can be used to change the current View:

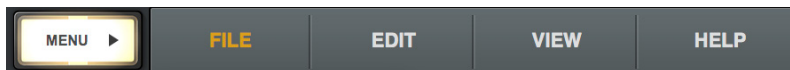
- Click the [View Selectors](#) in the View Column
- Select the View from the Application Menu
- Use the [Keyboard Shortcuts](#)

## View Options

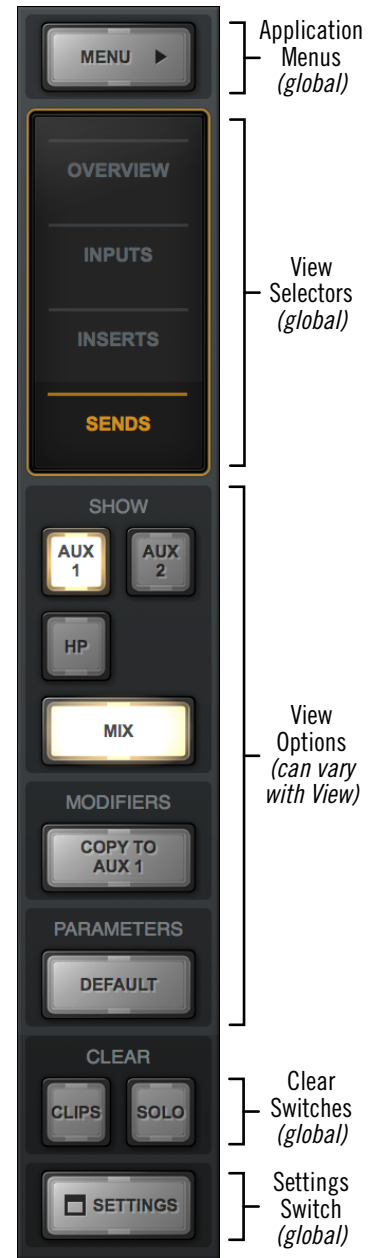
The [View Column Options](#) activate various control functions within each View. The displayed View Options are contextual; some options change when a different View is selected.

## Application Menus

Clicking the Menu switch presents the Application Menus, where various Console functions are accessed.



*The Application Menu*



*View Column as it appears in Sends View*

## Clear

The [Clear Switches](#) are used to reset all signal clipping indicators and turn off/on the solo function on all channels.

## Settings

The Settings switch opens the separate [Console Settings](#) window, where various global Apollo Solo functions are defined.

## View Elements

Each View displays related elements and associated functionality in input channel strips within the main area of the Console window.

**Note:** The main monitor mix controls (input labels, faders, solo, mute, pan) are the same in all views unless specifically hidden in Sends view.

The channel input elements of each view are shown below. Complete details for all elements are described in [Console Reference](#).



Each View displays different elements in the input channel strips

## Monitor Column Overview

The Monitor Column (illustrated at right) is always visible at the right side of the Console window. The Monitor Column contains elements related to monitor outputs, cue (HP) outputs, insert effect printing, and session file management.

For detailed descriptions, see [Monitor Column](#).

### Monitor Meters

These meters display the signal levels of the monitor mix bus just before the monitor level control. Levels displayed here mirror the state of the dual Monitor LED meters on Apollo Solo's top panel.

### Global Insert Effects

These switches globally switch all Console inputs to either pass UAD insert effect processing to the DAW (print wet) or not (monitor wet but print dry).

Insert Effects can also be individually switched on a per-channel basis (see [Channel Insert Effects](#)). The Global Insert Effects switches override the individual channel settings.

### Show Strips

These switches show and hide the visibility of the auxiliary return strips and/or the control room options strip. Each strip is visible when its SHOW switch is lit.

### Cue Outputs Popover

Clicking this switch opens the [Cue Outputs Popover](#), where the headphone output source (either the main monitor mix or the HP cue mix) is selected.

### Monitor Output Options

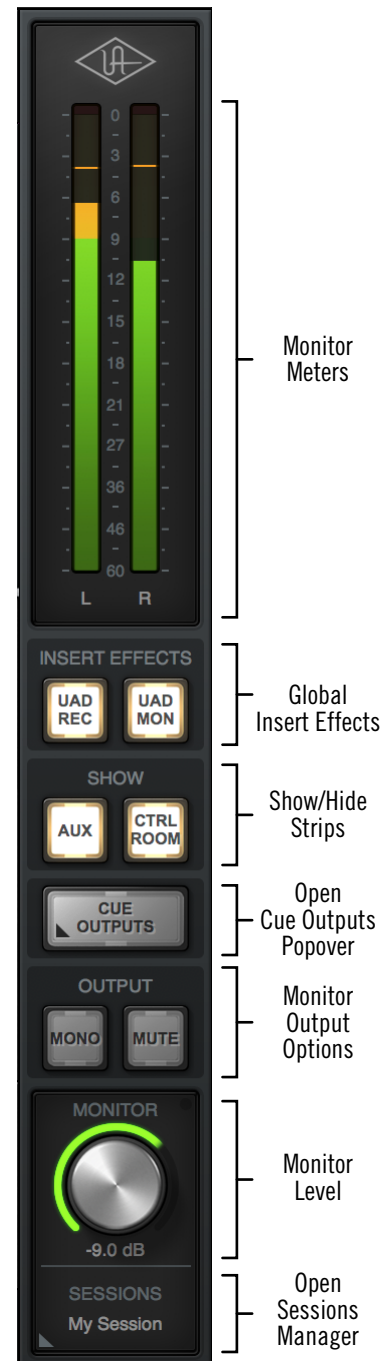
The main monitor outputs can be muted and/or set to monophonic with these switches.

### Monitor Level

This is the master level control for Apollo Solo's main outputs. It performs the same function as the MONITOR knob on Apollo Solo's top panel. When the ring around the knob is RED, the monitor outputs are muted.

### Sessions Menu

Clicking this switch opens the Session Manager popover window, where Console configuration files are managed.



*Monitor Column*

# Channel Strips Overview

Each Console input channel strip (illustrated at right) controls a corresponding Apollo Solo input. The output of all Console channel input strips are always routed to Console’s monitor outputs (except when muted).

Console’s input channel strips are essentially the same for all inputs, however there are some differences among the analog and virtual inputs, as noted below.

**Note:** For detailed descriptions, see [Channel Input Controls](#).

## Signal Flow

Audio signals in a Console channel flow through the inserts serially from top to bottom. Therefore, if more than one plug-in is inserted in a channel, the location of a plug-in within the inserts can impact the sound of the channel. Plug-ins can be reordered by dragging them to change the serial processing order.

## Input Types

Console has analog and virtual inputs. The controls that are available in each strip depends on the type of input.

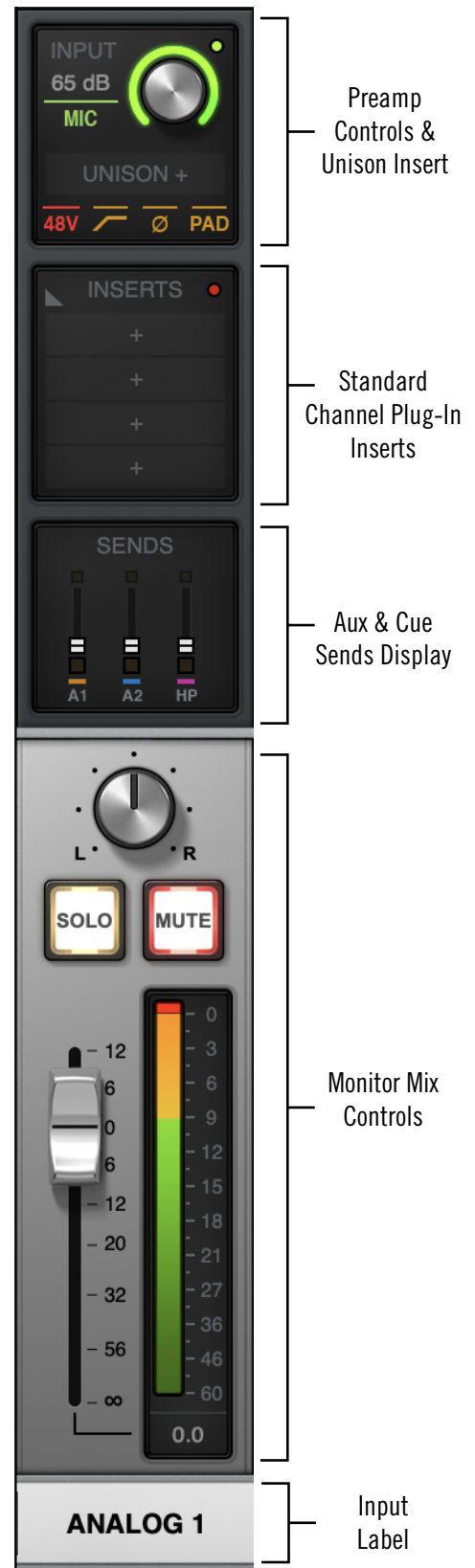
## Preamp Inputs

Inputs 1 and 2 are analog preamp channels that have multiple physical inputs (mic, line, Hi-Z) that can be selected with the preamp controls.

The analog inputs are switched between mic and line inputs manually via Console or Apollo Solo’s top panel. Channel 1 is automatically switched to Hi-Z input when a ¼” mono (tip-sleeve) cable is plugged into Apollo Solo’s front panel Hi-Z input jack.

## Virtual Inputs

The virtual input channels do not control Apollo Solo’s hardware inputs. Instead, they receive digital signals from DAW outputs via Apollo Solo’s device drivers, enabling Realtime UAD Processing on any DAW output. This feature is especially useful when playing virtual software instruments live through UAD plug-ins because it reduces I/O buffered input latency. For complete details about this feature, see [Virtual I/O](#).



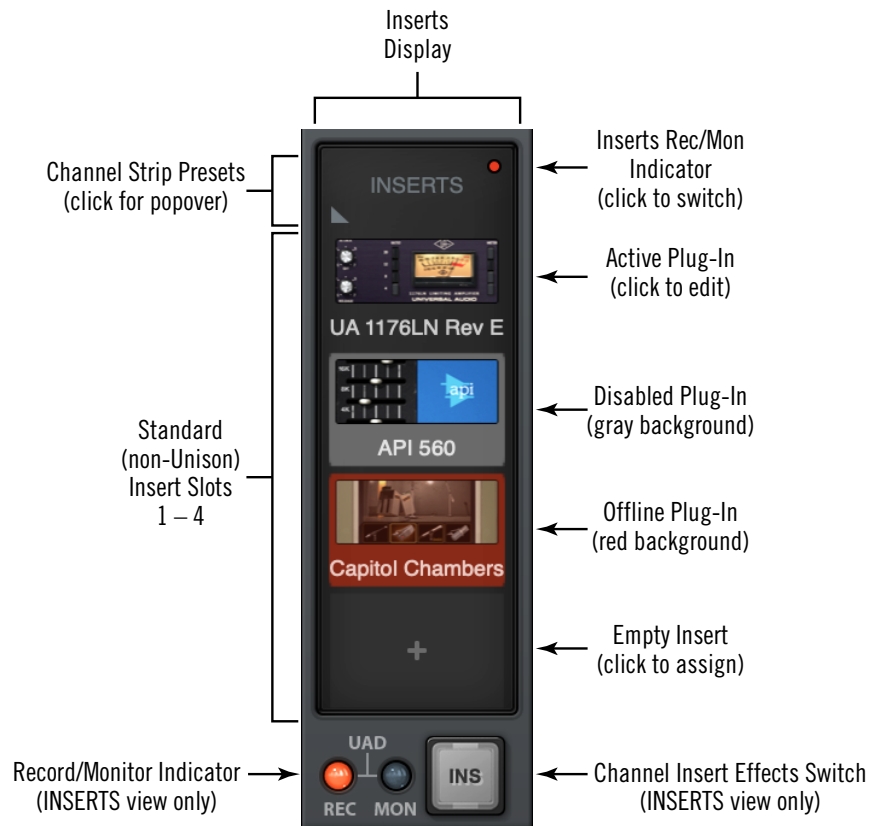
*Input channel strip*

# Console Plug-In Inserts Overview

The UAD plug-in inserts within each input and auxiliary strip is where UAD Powered Plug-Ins are selected and used for Realtime UAD Processing within Console.

Both of Apollo Solo's analog preamp inputs have a special dedicated Unison insert in addition to four standard inserts. Both virtual inputs, and both auxiliary returns, also have four standard inserts each. Therefore, up to five UAD plug-ins can be serially chained (stacked) per channel within the constraints of available DSP resources.

**Note:** For complete details, see [Console Plug-In Inserts](#).



Channel Inserts

## Unison Insert

Apollo Solo's Unison technology is activated when a Unison-enabled UAD plug-in is loaded in the special dedicated Unison insert slot located above the preamp options (as shown at right, outlined in red).

**Note:** Audio on preamp channels is processed by the Unison insert (if populated) before the channel inserts.

The special dedicated Unison insert is only available on Apollo Solo preamp channels. However, Unison inserts are operated exactly the same way as standard channel inserts. See the [Unison](#) chapter for related information.



Unison Insert

## Insert Effects Overview

The Insert Effects settings are used to specify whether or not Realtime UAD Processing in Console is recorded (printed) in the DAW.

- Console inputs are recorded with processing (wet) when Insert Effects is enabled. The UAD-processed signals are heard and recorded.
- Console inputs are recorded without processing (dry) when Insert Effects are disabled. The UAD-processed signals are heard, but not recorded.

**Important:** *UAD plug-in processing in Console's Unison insert and auxiliary inserts are always routed to the DAW, regardless of the current Insert Effects setting (Unison and aux insert processing is always recorded).*

### Function of the Insert Effects Switch

The Insert Effects switch determines if the DAW records Console's inputs with or without Realtime UAD Processing, regardless of the actual wet or dry state of the monitor mix. This is accomplished by routing Console's inputs into the DAW from before the plug-in inserts (dry recording) or after the plug-in inserts (wet recording).

#### Record With Effects

When Insert Effects are record-enabled (UAD REC lit), Apollo Solo's channel input signals are processed by Console's standard UAD plug-in inserts *before* being routed into the DAW.

In this mode, the post-insert (wet) state of all Console inputs with Realtime UAD Processing is routed to the DAW inputs.

**Tip:** *This setting is used to record "wet" with Realtime UAD Processing.*



#### Monitor With Effects

When Insert Effects is *not* record-enabled (UAD MON lit), Apollo Solo's channel input signals are routed directly into the DAW *before* being processed by Console's standard UAD plug-in inserts.

In this mode, the pre-insert (dry) state of all Console inputs is routed to the DAW inputs, even if Realtime UAD Processing is occurring in the monitor mix.

**Tip:** *This setting is used to record "dry" when Realtime UAD Processing is active.*



#### Individual Channel Insert Effects

Insert Effects can be recorded wet or dry on a per-channel basis. For details, see [Channel Insert Effects](#).

#### Global Insert Effects

Insert Effects for all channels can be globally switched to override the individual channel insert effect switches. For details, see [Global Insert Effects](#).



## Popover Windows

Some Console functions that are not visible in the main window are accessed in popover windows. Popovers are a special type of window that automatically close when any area outside of the popover is clicked.

**Note:** *The size of popover windows cannot be adjusted.*



*Typical popover window — in this example, the rename/link popover*

To close any popover, click anywhere outside of the popover, press the X button at upper right of the window, or type the esc (escape) key on the computer's keyboard.

The following functions are accessed via popover windows:

Cue output assign	Channel presets
Rename/link input channels	Console session presets
Sends (Aux & Cue)	Console Tempo
Plug-in insert assign	I/O Matrix assign
Plug-in presets	I/O Matrix presets

## HP Cue Overview

A cue mix bus is used to create a unique mix that is separate from the main monitor mix. Cues are typically used for performers that want to hear a headphone mix that is different from the main monitor mix (“more me”), sending separate mixes to other rooms or audio equipment, and similar applications.

In addition to the main monitor stereo mix bus and the two auxiliary stereo mix buses, Apollo Solo features one stereo cue mix bus that can be routed to the headphones or a DAW.

### HP Cue Label

Apollo Solo’s cue mix bus is labeled HP (headphones) to reflect the available hardware outputs on the device.

### Cue Components

The complete HP cue system is comprised of the cue mix bus, the cue sends, and the cue outputs.

**Cue Mix Bus** – The HP cue mix bus is the summed stereo mix of individual audio signals. Signals are routed into the cue mix bus via the cue send controls, and returned from the cue mix bus via the cue output controls in the CUE OUTPUTS popover.

**Cue Sends** – The cue sends adjust the individual channel signals going into the cue mix bus. Each input channel and aux return contains individual level, pan,\* and mute controls for the cue mix bus. All cue sends are pre-fader and pre-mute so they are not affected by adjustments to the main monitor mix.

*\*Exception: If two input channels are stereo-linked, the cue sends on the stereo pair cannot be panned. Sends for stereo channels are hard-panned left and right.*

**Cue Outputs** – The cue mix bus is returned via the CUE OUTPUTS popover, which optionally routes the cue to Apollo Solo’s headphones output.

*Note: By default, the main monitor mix is routed to the headphones. To hear the cue mix, HP must be selected as the source in the CUE OUTPUTS popover.*

**Cue Monitoring** – The HP cue output can be selected as a source for the main monitor outs via the [Monitor Source Select](#) switch, enabling the HP cue bus to be heard in the main monitor speakers.

### Cue Count

Apollo Solo has one HP cue mix bus. Other Apollo models have up to four separate cue mixes available.

## Sends Overview

Apollo Solo has four stereo mix buses that are configured and adjusted within Console: Monitor, auxiliary 1, auxiliary 2, and HP cue. Each Apollo Solo input has independent level, pan, and mute controls for each of the stereo mix buses. These controls are used to “send” signals into the mix bus.

### Stereo Mix Buses

In addition to the main monitor mix, the following stereo mix buses are available:

#### AUX 1 & AUX 2

The two stereo auxiliary buses are typically used for shared effect processing (to reduce UAD resource usage) for realtime monitoring with time-based effects such as reverb and/or delay. The aux mixes are adjusted via each input’s two aux send controls.

By default, the aux sends are post-fader and post-mute. The aux sends can be switched to be pre-fader and pre-mute. The [Aux Pre / Aux Post](#) function switch for each aux is located in its respective auxiliary bus return strip.

#### HP Cue

The HP cue bus is for creating a stereo mix that is different from the main monitor mix. Cues are typically used for performers that want to hear a headphone mix that is different from the main monitor mix, or for routing individual channels or mixes to other equipment.

The HP cue mix is adjusted via the HP send on each input and aux strip. All HP sends are pre-fader and pre-mute so they are not affected by adjustments to the main monitor mix.

### Mix Bus Returns

The stereo mix bus returns are used to route the mix to available outputs.

#### AUX

The auxiliary mixes are routed to the aux return strips. HP sends are available on the aux returns for routing aux effects to the HP cue mix bus.

See [Aux Returns](#) for details.

#### HP Cue

The HP cue mix is heard via the selections in the monitor controls section. To hear the HP cue mix in the headphones, HP must be manually routed to the HP output via the [Cue Outputs Popover](#).

The Monitor outputs can be switched to output the HP cue mix instead of the monitor mix.

## Sends Access

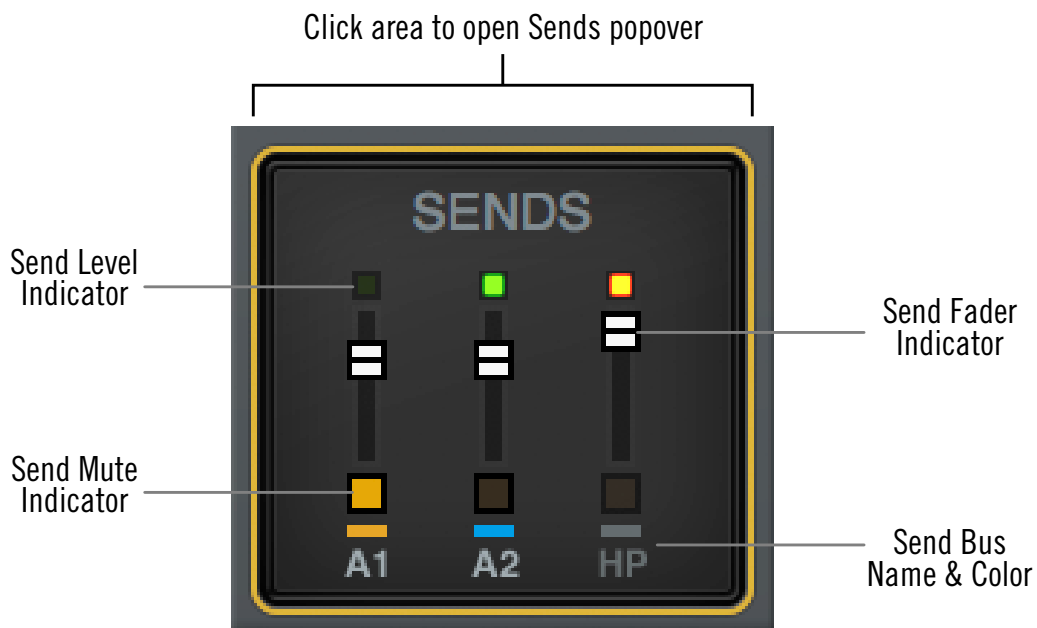
The Sends can be accessed and adjusted in the Overview and Sends views.

**Note:** Sends are not visible in the Inputs and Inserts views.

### Overview View

An overview of an input's sends state is shown in each input channel strip, as shown below. Clicking this overview opens the [Sends Popover](#), where the send levels can be adjusted. If the Console window is vertically re-sized tall enough, individual send knobs appear in place of the sends overview.

**Tip:** If the HP output source is currently assigned to the main monitor mix in the Cue Outputs popover, the HP bus color is gray.

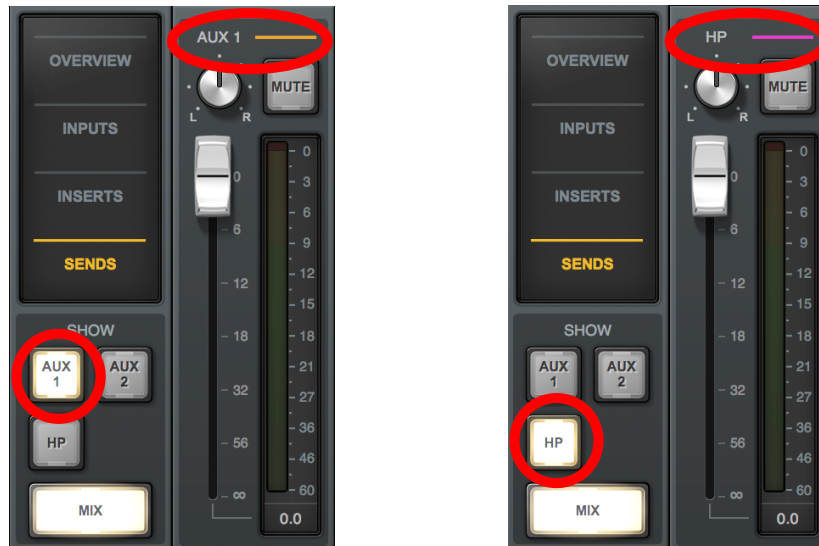


*The Sends Display within each input channel strip in Overview view*

## Sends View

A single send is displayed for all channels simultaneously in Sends View. The displayed send is selected with the SHOW switches in the View column. Sends view offers long-throw faders for finer control resolution.

**Tip:** To increase the Send control's resolution when in Sends view, increase the vertical size of the Console window and/or deactivate the MIX switch within the View column's SHOW area.



*In Sends view, the same send is visible on all inputs.  
Clicking the available SHOW switches displays the different sends.*

## Show All Sends Option

All sends can be viewed simultaneously by holding the Option (Mac) or Windows (PC) key on the computer keyboard while clicking any AUX or HP SHOW switch in Sends View.



*All sends are visible at the same time when an AUX or HP SHOW switch is option-clicked*

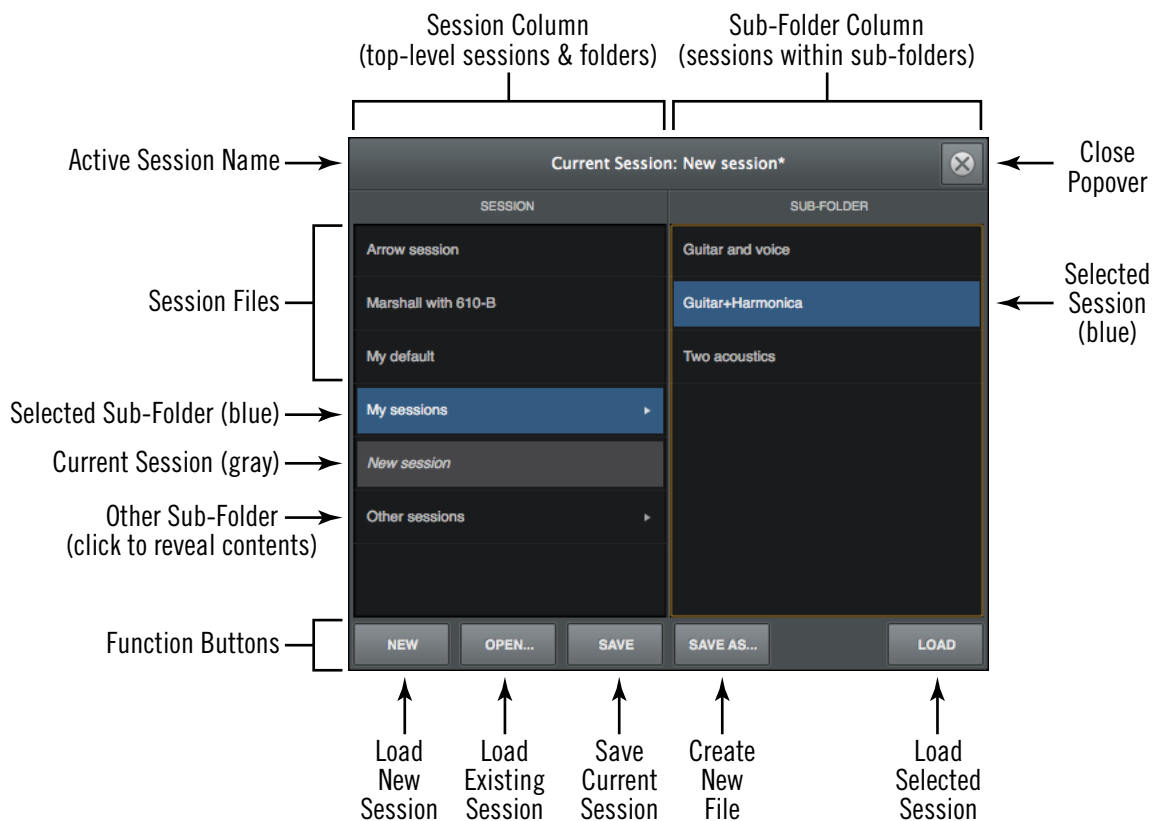
# Console Sessions Overview

The controls within the Sessions Manager popover provide methods for managing complete Console configurations as session preset files. When a Console session file is saved, the current Console configuration is written to disk.

When a session file is subsequently reloaded, Console is returned to the exact same configuration state, regardless of any changes to Console that were made in the interim.

**Note:** Monitor settings and hardware settings are global parameters that are not saved in Console session files.

For complete details, see [Console Sessions](#).



Sessions Manager popover

## Console Settings Overview

Global parameters for Apollo Solo and Console are configured in the separate Console Settings Window.

**Note:** For complete details, see [Console Settings](#).

### Console Settings Panels

Controls within the Console Settings window are arranged according to related functions. Each set of related controls are contained within a single panel.

Five panels are available in the Console Settings window:

**Hardware** – Settings related to Apollo Solo hardware device setup

**I/O Matrix** – Settings related to Core Audio/ASIO and custom driver I/O mapping

**Display** – Settings related to how and what items are displayed in Console

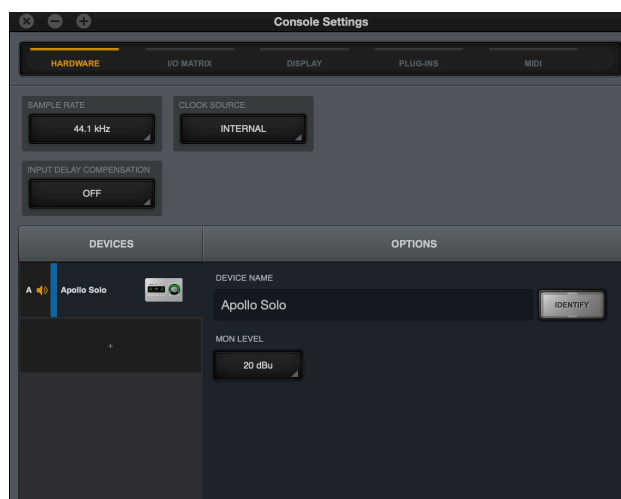
**Plug-Ins** – Settings related to UAD plug-ins used within Console

**MIDI** – Settings for configuring MIDI control of Tap Tempo within Console

### Accessing Console Settings

The Console Settings window can be opened using any of these methods:

- Choose View>Settings from the [Application Menus](#)
- Click the SETTINGS button at the bottom of the [View Column](#)
- Use the command+comma (Mac) or ctrl+comma (Windows) keyboard shortcuts
- (Mac) Choose Console Settings under the UA icon drop menu in the macOS Menu Bar
- (Windows) Right-click the blue UA diamond logo in the Windows System Tray (at lower right of screen), then choose Console Settings from the contextual menu



*The Hardware panel within the Console Settings window*

## I/O Matrix Overview

Apollo Solo's powerful I/O Matrix enables virtual mapping of I/O routes, channel counts, and labels at the Core Audio / ASIO driver level. For complete I/O Matrix details, see [I/O Matrix Panel](#).

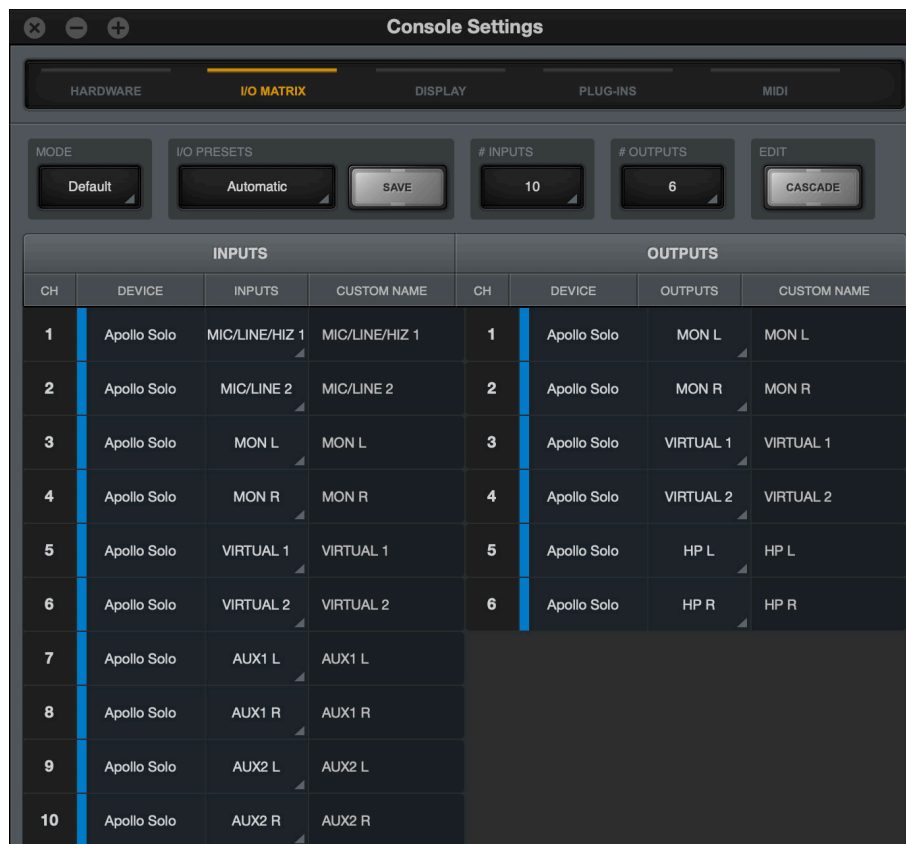
**Important:** Custom driver I/O routing changes the driver I/O complement. Quit all audio applications before changing driver I/O assignments.

**Custom I/O Maps** – With the I/O Matrix, it's possible to remap Apollo Solo's driver inputs/outputs to any Core Audio / ASIO inputs/outputs, offering the ultimate in I/O routing flexibility when using any DAW.

**Custom I/O Names** – The driver labels for Apollo Solo's I/O can be renamed so DAW inputs and outputs can use custom names. With the I/O Matrix, channel input and output selectors within a DAW can be (for example) “Electric Guitar” instead of “Input 1.”

**Custom I/O Presets** – Customized I/O tables can be saved and loaded to or from disk as presets for future recall and/or sharing with other Apollo Solo users.

**I/O Matrix Panel** – The I/O Matrix panel is the software interface for all I/O Matrix features. This is where Apollo Solo's I/O can be renamed, remapped, and saved for future use.



*I/O Matrix features are configured in the I/O Matrix settings panel*



## Multiple Undo/Redo

Console supports multiple levels of Undo and Redo for all edit operations. Undo and Redo operations can be performed repeatedly to step backwards and forwards through edit operations as long as the current session is open.

- To step backwards and undo (revert) edit operations, choose Undo from the [Edit Menu](#) or type command-z.
- To step forwards and re-execute the edit, choose Redo from the [Edit Menu](#) or type command-shift-z.

## Undo/Redo Cache

Edits are stored in the Undo/Redo cache. Edits within a particular session can be reverted with Undo/Redo until the cache is cleared. Both of these operations will clear the Undo/Redo cache:

- Console is quit
- A different Console session is loaded

***Important:*** *Prior Undo/Redo operations cannot be performed after the Undo/Redo cache is cleared.*

# Keyboard Focus & Control

Many Console functions can be controlled without using a mouse. When elements on the screen have keyboard focus, they can be quickly navigated with the computer's QWERTY keyboard.

## Focus Indication

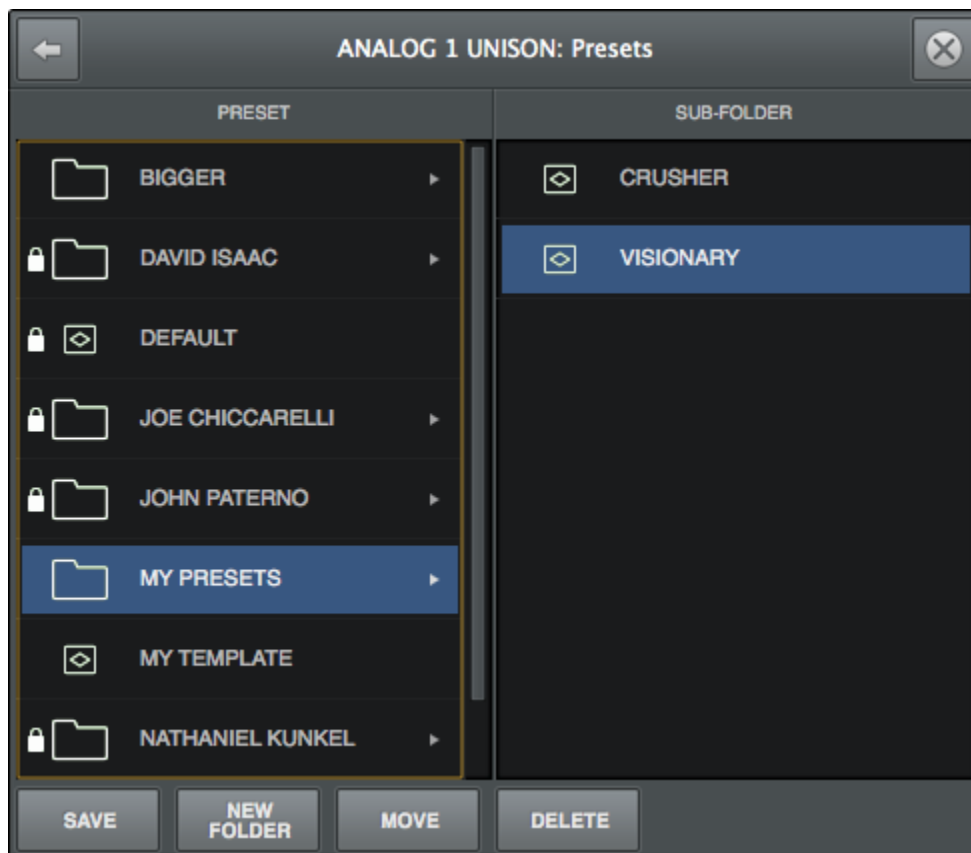
Keyboard focus in Console is indicated by a orange-colored highlight box outlining the screen elements that are targeted for keyboard control.

## Focus Navigation

Focus between elements can be changed with the computer's TAB key, or by clicking another area of the screen with the mouse.

## Focus Control

Focused items can be selected by using the up/down/left/right Apollo Solo keys and/or the Return/Enter keys.



*Typical focus indication. The PRESET column on the left has focus (orange outline) and can be navigated with the up/down Apollo Solo keys on the keyboard. The tab key alternates focus between the two columns.*

# Adjusting Console Controls

Console uses typical software control techniques to adjust parameters.

**2-state switches:** Click to toggle the state.

**Knobs:** Click+drag to adjust, or use the [Controls Shortcuts](#). Console's rotary controls (and UAD plug-in knobs) can respond to Linear, Circular, or Relative Circular adjustments modes. The CONTROL MODES preference is set in DISPLAY panel within the Console Settings window.

**Faders:** Click+drag to adjust, or use the [Controls Shortcuts](#).

**Drop Menus:** Click to view the drop menu contents, then click an item in the drop menu to select the item.

**UAD Powered Plug-Ins:** Most UAD plug-in controls use the same methods as above. However, some plug-in parameters may have custom controls that are unfamiliar or not obvious. All custom controls are detailed for individual plug-ins in the [UAD Plug-Ins Manual](#).

## Controls Shortcuts

In addition to the keyboard shortcuts below, several other shortcuts are available to simplify Console control adjustments.

**Fine Control:** Continuous controls (knobs and faders) can be adjusted with increased resolution by depressing the SHIFT while adjusting these controls.

**Scroll Wheel:** Continuous controls (knobs and faders) can be adjusted by using the computer input device's scroll function (e.g., mouse scroll wheel). To modify the parameter value, hover the cursor over the control and adjust the scroll wheel.

**Adjust All:** If the Option key (Mac) or Windows key (PC) is held down while modifying any control, the same control on all inputs (or aux returns) will be adjusted at the same time. The relative difference is maintained between the same controls until any control reaches its minimum or maximum value.

**Return To Default:** If the Command key is held when a control is clicked, the control will return to its default value. Command+Option+Click will return all controls of the same type to their default value.

**Mute/Solo All Toggle:** Option-click a Mute or Solo switch to toggle the state on all channels.

**Drop Menus:** Menus continue to display after a single click. The mouse button does not need to be held down to view the menu.

# Keyboard Shortcuts

Console supports the keyboard shortcuts listed in the table below.

Shortcut Name	Keyboard Command (Mac)	Keyboard Command (Windows)	Description
New Session	Command+N	Ctrl+N	Create a new default session
Open Session	Command+O	Ctrl+O	Load an existing session file from disk
Save Session	Command+S	Ctrl+S	Save current session file to disk
Save Session As...	Command+Shift+S	Ctrl+Shift+S	Save current session as new file with optional rename
Hide Application	Command+H	Ctrl+H	Hide application from view
Quit Application	Command+Q	Ctrl+Q	Quit Console application
Overview	Command+1	Ctrl+1	Switch main view to OVERVIEW
Inputs	Command+2	Ctrl+2	Switch main view to INPUTS
Inserts	Command+3	Ctrl+3	Switch main view to INSERTS
Sends	Command+4	Ctrl+4	Switch main view to SENDS
Show/Hide Aux	Command+A	Ctrl+A	Show/Hide the Auxiliary Returns
Show/Hide Inputs	Command+I (the letter i)	Ctrl+I (the letter i)	Activate Show/Hide Inputs modifiers
Focus Navigation	Tab	Tab	Cycle through orange-outlined areas that can be focused/controlled/navigated with the Apollo Solo keys
Show Plug-In Editors	Command+P	Ctrl+P	Bring all open UAD plug-in windows to foreground
Close All Editors	Command+Option+W	Ctrl+Option+W	Close all open UAD plug-in windows
Close Window	Command+W	Ctrl+W	Close foreground window
Element Navigation	Left/Right/Up/Down (arrow keys)	Left/Right/Up/Down (Apollo Solos)	Select focused elements with the arrow keys
Cancel Dialog	ESC (escape)	ESC (escape)	Cancel dialog functions such as Plug-In Assign, Preset Select, Save As, Popovers, etc.
Confirm Dialog	Return or Enter	Return or Enter	Accept dialog functions such as Plug-In Assign, Preset Select, Save As, etc.
Console Settings	Command+, (comma)	Ctrl+, (comma)	Open Console Settings window
Undo Edit	Command+z	Ctrl+z	Revert the last executed function (multiple Undo possible)
Redo Edit	Command+Shift+z	Ctrl+Shift+z	Revert the last executed Undo (multiple Redo possible)

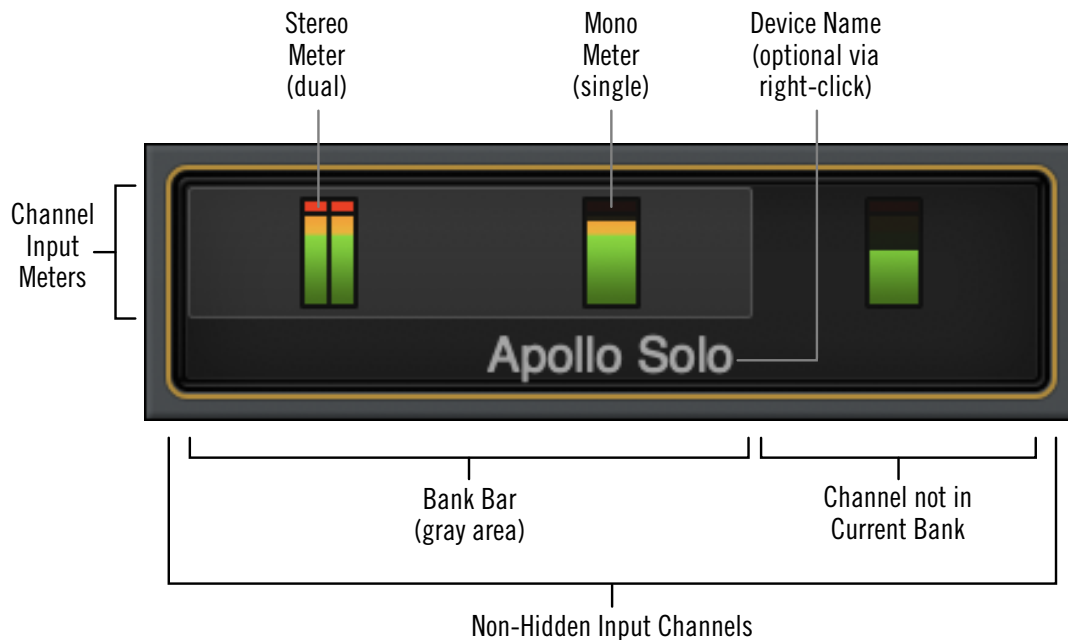
# Console Reference

This chapter provides in-depth descriptions of all controls within Console. For a general operational overview, see [Console Overview](#).

## Meter Bridge

The Meter Bridge is always visible at the top of the Console window. It displays all visible input channels, signal activity at these inputs, and the *Bank Bar*, which is used to scroll inputs that are out of horizontal view (if any).

Refer to the diagram below for descriptions in this section.



*Meter Bridge elements*

## Input Channels

The Meter Bridge represents all Apollo Solo USB input channels. When an input channel is hidden with the [Show/Hide Inputs](#) function, that channel is not displayed in the Meter Bridge.

## Channel Meters

Each vertical green meter represents input signal activity in the channel. These small meters mirror the activity of each high-resolution [Input Meter](#) that is displayed next to each channel's [Input Fader](#).

## Bank Bar

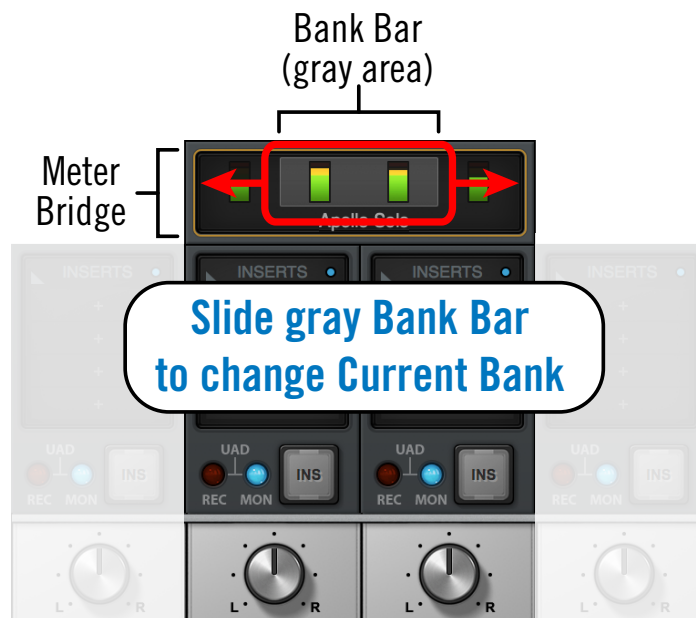
When the Console window does not have enough available horizontal space to display all available input channels, the gray Bank Bar appears within the Meter Bridge.

The Bank Bar “floats” on top of all input channels in the Meter Bridge. The Bank Bar is used to change the channels that are visible within the Current Bank.

**Note:** The Bank Bar only appears when the Console window is too narrow to display all input channels.

## Current Bank

The Current Bank is all input channels that are currently displayed in the main body of the Console window (below the Meter Bridge) as shown in the illustration below. The gray Bank Bar is used to change the Current Bank.



*Slide the Bank Bar or use the methods below to bring other inputs into view*

## Changing the Current Bank

Any of these methods can be used to change the channels within the Current Bank:

**Click** – Click anywhere within the Meter Bridge, but outside of the Bank Bar. The Bank Bar jumps to the channel that is clicked in the Meter Bridge.

**Drag** – Click-hold-drag the gray Bank Bar to slide it across available channels.

**Hover Scroll** – Position the mouse over the Meter Bridge then scroll horizontally with the computer’s input device.

**Arrow keys** – When the Bank Bar has keyboard focus, use the computer’s left/right Apollo Solo USB keys to navigate the Current Bank.

## Meter Bridge Menu

The Meter Bridge menu provides access to various functions related to the Meter Bridge. To view the menu, right-click or control-click within the Meter Bridge.

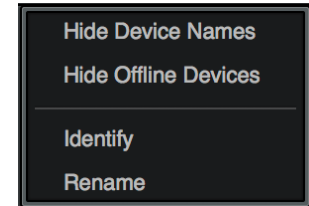
**Show/Hide Device Names** – See [Show Device Names](#).

**Show/Hide Offline Devices** – By default, devices in the Hardware panel within the Console Settings window that are not currently connected are displayed in the Meter Bridge. To show/hide offline devices, choose this item from the menu. Show/Hide Offline Devices is available exclusively within this menu.

**Identify** – See [Identify](#).

**Rename** – See [Device Name](#).

**Note:** All functions in the Meter Bridge menu except Show/Hide Offline Devices are available elsewhere within Console.



# View Column

**Note:** For an overview of Console's View Columns, see the [View Column Overview](#).

The View Column is always visible at the left side of the Console window. The View Column contains the View Selectors and switches for the View Options (functions) available within each view.

Each View Column also contains several common view elements that are available in every View.

## Available Views

Four Views are available in Console: Overview, Inputs, Inserts, and Sends. Each View displays related elements and associated functionality in the main area of the Console window.

## Common View Elements

Most display and control elements that appear within the main Console area (see [Global Window Elements](#)) in each View are common to all the Views.

The common elements are detailed separately from the View Column descriptions.

## View Selectors

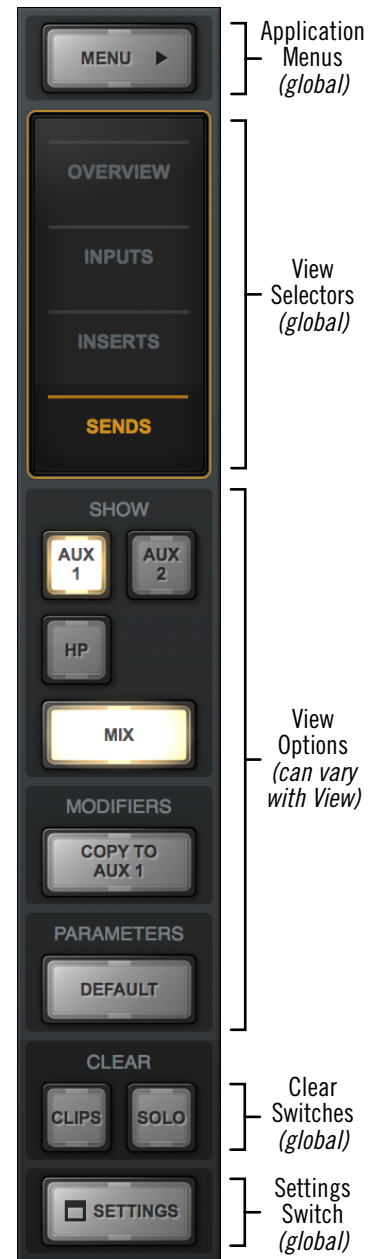
Any of these methods can be used to change the current View:

- Click any View Selector in the View Column
- Choose the View from the [Application Menu](#)
- Use the keyboard shortcuts:  
Mac: ⌘1, ⌘2, ⌘3, ⌘4  
Windows: ctrl 1, ctrl 2, ctrl 3, ctrl 4

## View Column Options

The View Options activate the various control functions available within each view. The View Options in Overview, Inputs, and Inserts Views are identical; the View Options change when Sends View is active.

View Option functions are performed using latched modifiers. See the [Modifiers Overview](#) for details on how to operate the View Option controls. See [View Options](#) for descriptions of the individual option functions.



*The View Column as it appears in SENDS View*

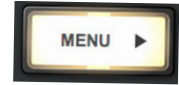


## Global View Column Controls

Several controls appear in all View Columns. These controls (detailed below) have identical functionality in all Views.

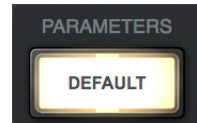
### Menu Switch

The MENU switch is located at the top of the View Column. Clicking the switch reveals the [Application Menu](#), where various Console functions can be accessed.



### Default Switch

When [Option Latch](#) is active with the parameters DEFAULT switch, clicking any control returns the parameter to its default value.



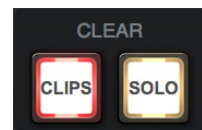
***Note:** The DEFAULT function is primarily for knob and fader values. It does not apply to any preamp settings, plug-in inserts, SOLO/MUTE switches, monitor levels, customized input names, and similar functions.*

### Clear Switches

The CLEAR switches are located near the bottom of all View columns.

#### **CLEAR CLIPS**

This switch clears all clip indicators and peak hold indicators on all meters.



***Tip:** Clip and peak hold indicators can be individually cleared by clicking any individual meter.*

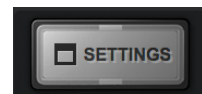
#### **CLEAR SOLO**

Whenever SOLO is engaged on any channel input, the CLEAR SOLO switch flashes yellow. Clicking the Clear Solo switch deactivates the Solo function of any/all channel inputs.

***Tip:** Click Clear Solo again to return all channels to their previous Solo states.*

### Settings Switch

The SETTINGS switch is located at the bottom of all View columns. It opens the Console Settings window, where many global functions are defined. For complete details, see [Console Settings](#).



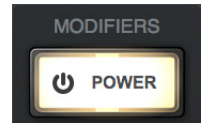
## Modifiers Overview

The [View Column Options](#) in each View Column enable various operations to be performed on the items within the View.

View Option operations are performed by selecting an option to latch the function, executing the operation(s) using Modifiers, then exiting the latched function.

### Option Latch

When a View Option switch is clicked, the switch flashes yellow, indicating that the function is latched and ready to be executed using the Modifiers.



*Power option latched*

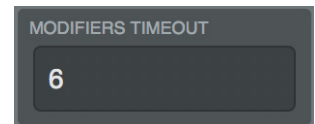
### Option Unlatch

The latched option is unlatched (the switch stops flashing) when:

- Any same or different option switch is clicked
- A different View is selected
- No operations are executed during the Modifiers Timeout period

### Modifiers Timeout

When an option is latched, it is automatically unlatched (times out) after the Modifiers Timeout period to prevent inadvertent modifications.



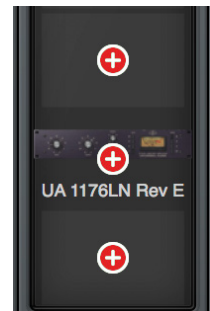
*Timeout preference*

The Modifiers Timeout is a preference set in the Display panel within the Console Settings window. The default Modifiers Timeout period is six seconds/flashes.

### Modifiers

Modifiers are icons superimposed on various elements when a View Option is latched. Modifiers are used to execute the operations. The specific modifiers that appear, and where they are located, depend upon the specific option that is latched.

Inserts modifiers are superimposed on insert slots for individual inserts, and the input channel names for plug-in channel strips.



*Paste Modifiers*

### Modifier Swipe Shortcuts

View Options can be executed extremely rapidly across many channels and/or inserts in the Current Bank using the modifiers swipe shortcuts. When a View Option is latched, click+hold the mouse, then drag vertically and/or horizontally across inserts and/or channel input names to perform the function on all locations that are swiped.

**Tip:** *Modifier swipe shortcuts are the fastest way to perform the same function on multiple inserts.*



*Swipe to rapidly perform the latched function on many inserts*

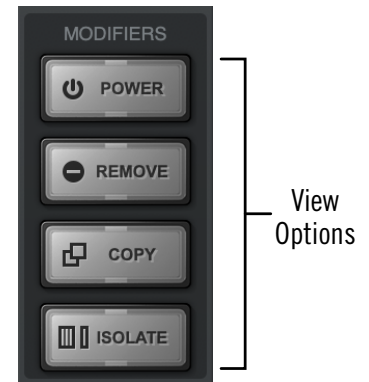
# View Options

The individual [View Column Options](#) are detailed in this section. See the [Modifiers Overview](#) for details about how to operate the Modifier controls.

## Overview, Inputs, & Inserts View Options

The View Options for the Overview, Inputs, and Inserts Views are identical. Each option is described below.

**Note:** *In the Overview View Column, the Power, Remove, Copy, and Isolate modifiers may not be visible if the Console window size is vertically condensed. To bring all Overview modifiers into view, increase the vertical window size if possible, or select a different View.*



*Overview, Inputs, & Inserts View modifier switches*

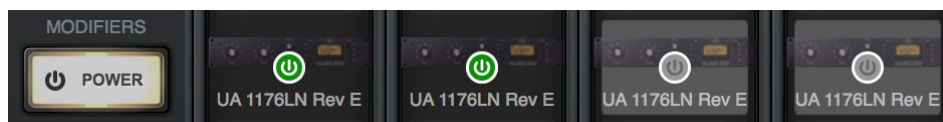
### Power Modifier

This option toggles an individual plug-in's power state within a single insert. When disabled, the plug-in no longer uses UAD DSP resources.

Click the POWER modifier switch to latch the option, then toggle any plug-in's power state by clicking its modifier, or swipe across multiple modifiers.

**Note:** *This option performs the same function as the [Plug-In Power](#) switch in the header within the plug-in editor window.*

When POWER is latched, disabled plug-ins are indicated by a gray modifier icon, and active plug-ins have a green modifier icon.



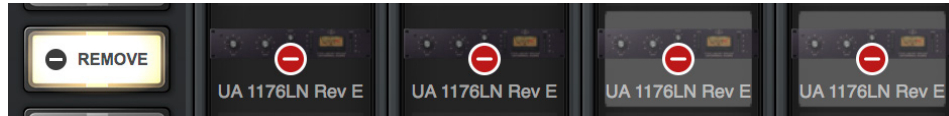
*The POWER modifier when latched. Plug-ins are shown powered (left) and disabled (right).*

Because this function unloads and loads the plug-in from the DSP, audio artifacts can occur if the power state is changed while audio is being processed by the plug-in.

**Tip:** *To disable individual plug-in processing without audio artifacts, use the power control within the plug-in interface instead, which keeps the plug-in loaded on the DSP.*

## Remove Modifier

This option deletes the plug-in from the insert slot. When the REMOVE switch is latched, click any insert's modifier to delete the plug-in, or swipe across multiple modifiers.



*The REMOVE modifier when latched. Plug-ins are removed by clicking/swiping its modifier.*

**Note:** Because this function unloads the plug-in from the DSP, audio artifacts can occur if a plug-in is removed while audio is being processed by the plug-in.

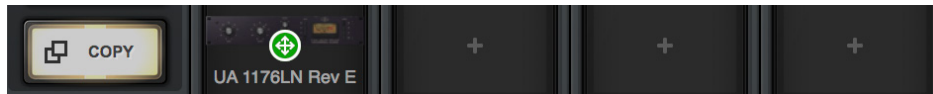
## Copy/Paste Modifier

This option is used to duplicate individual plug-ins or channel strips, and their current settings, from one insert(s) to any other insert(s).

Copy/Paste is a two step process. First the insert or channel strip is copied with the COPY modifier, then the copied data is pasted to the destination insert or channel.

### Copy Individual Plug-In

When COPY is latched, click any insert modifier to copy the insert's plug-in.

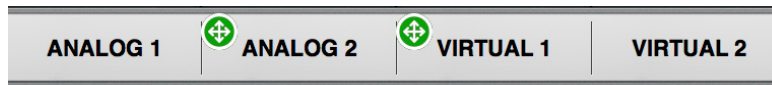


*The insert COPY modifier when latched*

### Copy Channel Strip

When Copy is latched, click any input name modifier (at the bottom of the input strips) to copy all plug-ins in the channel inserts.

**Note:** Only channels containing plug-ins will display the copy modifier.



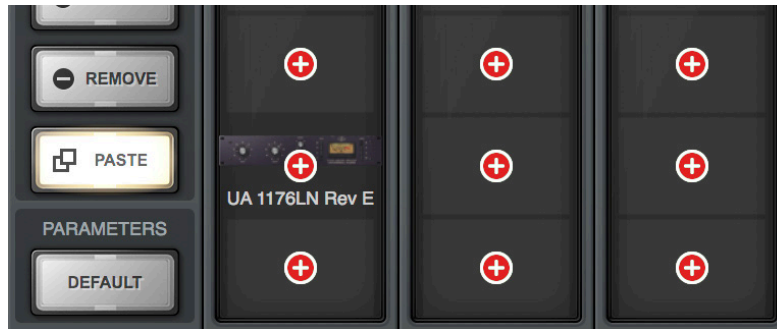
*The channel strip COPY modifier when latched*

## Paste Modifier

After any insert is copied, the COPY switch changes to PASTE. The copied data can be pasted to multiple destinations while the paste option remains latched.

### *Paste Individual Plug-In*

After an insert is copied, click or swipe across one or more destinations while the paste switch is latched.



*The PASTE modifiers appear on all inserts after copying an insert*

### *Paste Channel Strip*

After a channel strip is copied, click or swipe across any input name modifier to paste the copied channel strip plug-ins into the channel while the paste switch is latched.



*The PASTE modifier appears on input names after copying a channel strip*

## Isolate Modifier

Isolate always retains current channel settings when different Console and LUNA sessions are loaded. Isolated channels are also not controlled by LUNA. Isolate allows you to seamlessly monitor live hardware inputs with Realtime UAD Processing, even when changing Console and LUNA sessions.

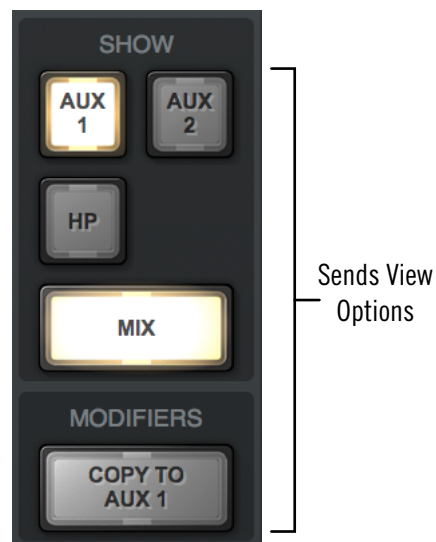
**Tip:** *To quickly isolate an individual channel, right-click a channel's input label then choose Isolate from the Input Label Menu.*



*When active, the [ISOLATE] label is displayed below input channel labels*

## Sends View Options

All View Options within Sends View are described below. See the [Sends Overview](#) for related information.



### Available Sends

Two SHOW AUX switches and one SHOW HP cue switch are always visible, reflecting Apollo Solo's available mix buses that a channel's signal can be routed to using the send controls.

## Show Sends

In Sends View, all mix controls for a single send mix bus, and/or the monitor mix bus, are displayed for all Console inputs simultaneously (see screenshots below).

**Note:** Only one send mix can be displayed at a time (the *SHOW SEND* switches are mutually exclusive).

The displayed mixes are determined by the state of the send and monitor *SHOW* switches in the Sends View column. The mix is visible when its switch is engaged (lit).

**SHOW MIX switch on** – The send’s mix controls are displayed above the monitor mix controls (left screenshot).

**SHOW MIX switch off** – Only the send’s mix controls are visible, offering maximum send fader resolution (center screenshot).

**SHOW MIX switch on and all SHOW SEND switches off** – Only the monitor mix controls are visible, offering maximum monitor fader resolution (right screenshot).

**Tip:** Sends View offers long-throw faders and meters for finer control resolution. To increase the control resolution of the mix faders in Sends View, increase the vertical size of the Console window.



Example screenshots of interaction between the send and monitor *SHOW* switches. By showing only one type of fader (either Send or Monitor), the faders are taller, offering finer control resolution.

## Show All Sends Option

All sends can be viewed simultaneously by holding the Option (Mac) or Windows (PC) key on the computer keyboard while clicking any smaller SHOW switch in Sends View.



All sends are visible when a SHOW switch is option-clicked

## Sends COPY TO Modifier

This switch instantly copies the current monitor mix to the send mix that is currently selected with the [Available Sends](#) switches.

**Tip:** The COPY TO function is typically used when a HP mix that is similar to the monitor mix is needed, but with minor adjustments (e.g., creating a “more me” cue mix).



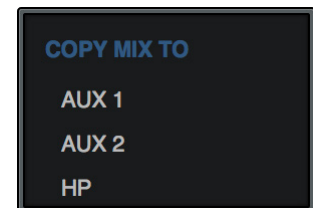
COPY TO modifier

The text label within the COPY TO switch changes to the send mix that is currently selected with the [Available Sends](#) switches, indicating the destination of the pasted monitor mix.

**Caution:** Use the COPY TO function carefully. Depending on the states of the monitor mix and the destination send mix, cue output routings, and the volume setting of monitoring systems (e.g., headphones) attached the cue outputs, this function could cause an extreme increase in volume at the destination outputs.

## COPY TO Menu

Right-clicking (or control-clicking) the main (silver) monitor faders presents the COPY TO menu. Selecting a destination performs the same function as the COPY TO modifier described above.



COPY TO menu

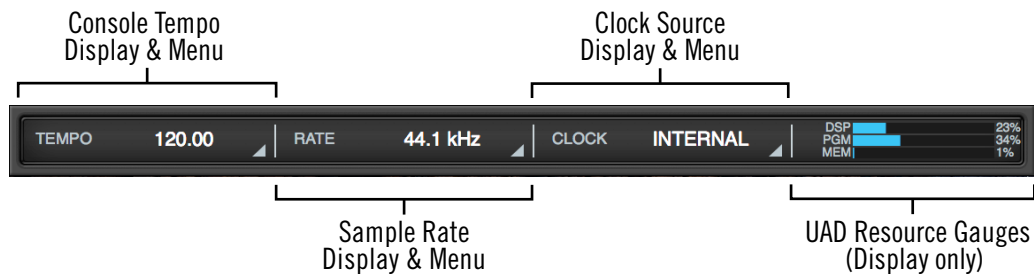


## Info Bar

The Info Bar is always visible at the bottom of the Console window. It displays and provides access to several important functions.

The Tempo controls are only available in the Info Bar. The Sample Rate and Clock Source controls are also available in the Console Settings window. The UAD Resource Gauges have no controls; they are visual indicators only.

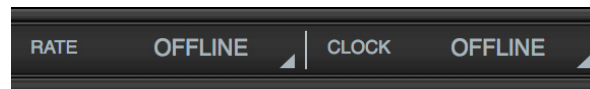
Refer to the diagram below for descriptions in this section.



*The Info Bar*

## Offline Hardware Display

If the Apollo Solo hardware is not properly connected or recognized, the sample rate and clock source will display OFFLINE as shown below.



*Sample Rate and Clock show OFFLINE when Apollo Solo is not detected*

## Tempo Display

This area displays the Console tempo in beats per minute (BPM). Clicking the tempo display opens the Tempo popover, where a new tempo can be typed or tapped.

### About Console Tempo

Console Tempo is used for time-based UAD plug-ins (such as delay and modulation) within Console that are set to use Tempo Sync. Console Tempo can be modified by typing a text value, tapping a tempo, or via MIDI.

**Note:** Console does not receive tempo information from the DAW.

The tempo value is saved within Console session files, and also within DAW files when the Console Recall plug-in is used within the DAW.

For details about how to use the feature with UAD plug-ins, see the [Tempo Sync](#) chapter.

## Tempo Popover

To display the Tempo popover, click anywhere in the Tempo Display within the Info Bar.

The available tempo range is from 1.00 BPM to 999.00 BPM. The default tempo of a new session is 120 BPM.



## Adjusting Tempo

### Text Entry

1. Open the Tempo window by clicking the Tempo Display in the Info Bar
2. Click the tempo text field, then type a numeric tempo value
3. Press Return or Enter, or click the close button with the mouse

*Tip:* To leave the tempo unchanged after entering an (unwanted) value in the Tempo window, press the ESC key or close the popover with the mouse.

### Tap Tempo

1. Open the Tempo window by clicking the Tempo Display in the Info Bar
2. With the mouse, click the TAP button at least four times to establish the tempo
3. Press Return or Enter, or click the close button with the mouse

## Changing tempo via MIDI

Tap tempo can be used to set a new tempo from incoming MIDI data. This method requires any external MIDI hardware and/or MIDI software that is recognized by the OS.

*Note:* MIDI drivers for the MIDI device may need to be installed and/or configured.

### About external MIDI tap tempo control

- The MIDI device must be properly configured before it can be used by Console.
- MIDI note values or MIDI controller values can be used as the data source.
- Console cannot synchronize the tempo to incoming MIDI beat clock.

### MIDI configuration/setup

1. Verify the MIDI output device or MIDI software is properly configured and active.
2. In the MIDI panel within the Console Settings window, set the values for DEVICE, TAP TEMPO CHANNEL, and TAP TEMPO EVENT to match the transmitted MIDI data.
3. Transmit the MIDI note or controller (as specified in the previous step) at least four times to establish the tempo. The Tempo Display is RED during this period.
4. After a new tempo value is established, the new tempo is used and the Tempo Display changes back to BLACK. Simply retransmit the MIDI data to apply further tempo updates.

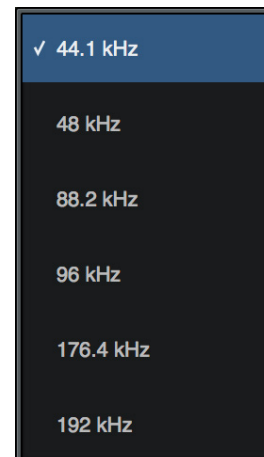
## Sample Rate Display

This area displays the current sample rate used for Apollo Solo's A/D-D/A conversion and UAD Powered Plug-Ins processing. When using UAD Powered Plug-Ins, higher sample rates require more UAD DSP resources.

## Sample Rate Menu

Clicking the Sample Rate Display presents the Sample Rate Menu, where the current sample rate can be changed.

**Important:** When a DAW is used with Apollo Solo, the sample rate is typically changed within the DAW's settings. If the sample rate is changed to a different value within Console when a DAW is active, digital artifacts could occur due to a sample rate mismatch.



## Hardware Clicks

When the sample rate is changed, hardware relays that mute the outputs are temporarily engaged to prevent audio artifacts. This action causes an acoustic clicking sound that can be heard within the hardware. These clicks are by design and can be safely ignored.

## Clock Display

The Clock Display is used to select an external clock source when a Universal Audio Apollo audio interface is connected to the system.

Because Apollo Solo does not have digital connections for external clocking, the Clock Display always displays INTERNAL or OFFLINE when an Apollo is not connected.

## UAD Resource Display

UAD plug-in loads are shown in the Resource Display at the far right of the Info Bar. These three gauges (DSP, PGM, and MEM) provide important visual feedback in realtime, by helping to determine which plug-ins to load if available UAD resources are limited.

The UAD resources are displayed as blue bar graphs and as percentages. These gauges have no controls; they are visual indicators only.

The UAD Resource Display mirrors the meters within the UAD Meter & Control Panel application. For detailed descriptions of all display elements, see [UAD Resource Display](#) in the UAD Meter & Control Panel chapter.


# Channel Input Controls

**Note:** For related information, see the [Channel Strips Overview](#).

## Preamp Controls

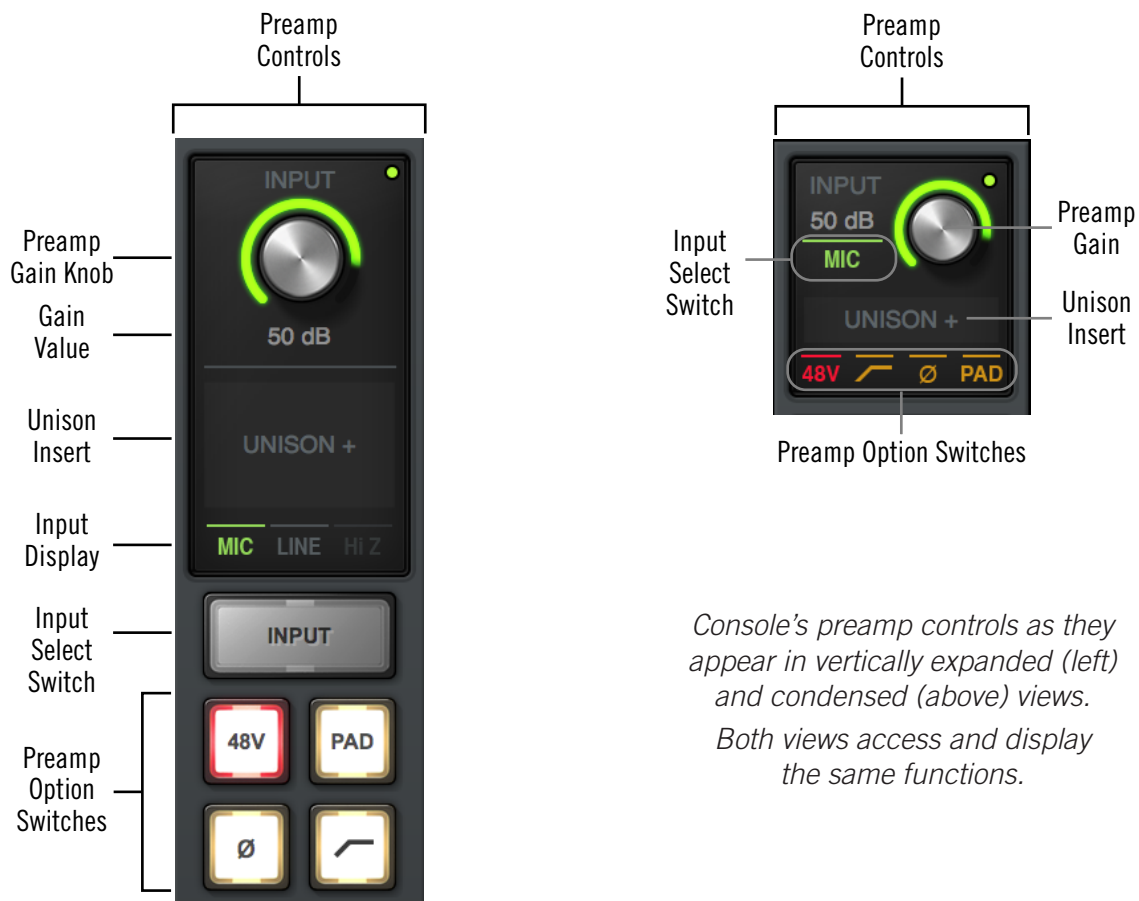
Console's preamp controls correspond to the equivalent preamp controls on Apollo Solo's top panel. Adjusting Apollo Solo's top panel will update Console (and vice versa); see [Interactions Between Console and Apollo Solo](#) for details.

## Unison Controls

 Some preamp hardware controls (Gain, Low Cut, 48V, Pad, Polarity) are Unison parameters that interact with Unison plug-ins placed in the Unison insert slot.

Unison preamp controls in this section are indicated by the Unison icon at the left of above paragraph. See [Unison](#) for complete details.

Refer to the illustrations below for element descriptions in this section.



*Console's preamp controls as they appear in vertically expanded (left) and condensed (above) views. Both views access and display the same functions.*

## Preamp Gain

**U** The channel's preamp gain is adjusted with this knob. The input to be adjusted (Mic, Line, or Hi-Z) is determined by the state of the channel's Mic/Line switch or the Hi-Z input (if connected).

Rotating the knob clockwise increases preamp gain for the channel. The available gain range for all preamp channels is 10 dB to 65 dB for the Mic, Line, and Hi-Z inputs.

### Gain Value

The specific amount of preamp gain in decibels is displayed in gray text near the gain control. The relative amount of preamp gain is indicated by the green LED ring surrounding the gain control in Console and the knob on Apollo Solo's top panel. The LED ring is a different color when Unison is active in the channel.

### Front Panel Channel Selection Indicator Dot

Apollo Solo's channel selection can be changed using the top panel hardware controls. The small colored dot that appears next to the gain control (as shown at right, outlined in red) indicates the preamp channel that is currently selected with Apollo Solo's top panel.



**Tip:** The indicator dot in Console changes channels when the channel selection is changed with Apollo Solo's top panel knob.

## Unison Insert

**U** Unison is an exclusive analog/digital integration technology that's built into every Apollo Solo microphone preamplifier. The preamp controls in Console (and the hardware unit) interact extensively with Unison plug-in parameters.

To add a Unison plug-in to the preamp channel, click the dedicated Unison insert slot located below the Gain control. See [Unison](#) for complete details.

## Input Select

This switch switches between the mic and line inputs on Apollo Solo's rear panel. Click the Input Select switch or Input Select display to change the input type. The currently selected input type is highlighted. To switch the input type in condensed views, click the currently displayed input type (as shown at right, outlined in red).



**Note:** Input Select has no effect if the Hi-Z input is connected, because preamp channels are automatically switched to the Hi-Z input when a 1/4" mono (tip-sleeve only) cable is connected to Apollo Solo's front panel Hi-Z input jack.

## Low Cut Filter

**U** When enabled, the channel's input signal passes through a low cut (high pass) filter. This 2nd-order coincident-pole filter has a cutoff frequency of 75 Hz with a slope of 12 dB per octave by default (the filter can change when Unison is active in the channel).

The Low Cut filter effects the Mic, Line, and Hi-Z inputs. Low Cut is typically used to eliminate rumble and other unwanted low frequencies from the input signal.

## 48V



When enabled, the 48V switch is red and 48 volts of phantom power is supplied to the Apollo Solo channel's rear panel Mic input. Most modern condenser microphones require 48V phantom power to operate. This option can only be activated when the Mic/Line switch is set to Mic.

**Caution:** *Activate 48V only with compatible equipment such as phantom powered microphones. Incompatible equipment can be damaged by the applied voltage.*

Depending on the current configuration of the Apollo Solo and Console, there may be a delay when changing the 48V state to minimize the clicks/pops that are inherent when engaging phantom power. The +48V LED on Apollo Solo's top panel flashes during any delay.

## Pad



When enabled, the PAD switch is yellow and the channel's microphone input signal level is attenuated by 20 dB. Pad does not effect the Line or Hi-Z inputs.

Pad is used to reduce signal levels when overload distortion is present at low preamp gain levels, such as when particularly sensitive microphones are used on loud instruments, and/or if the A/D converter is clipping.

**Tip:** *Activate PAD when the input is clipping but preamp gain is at minimum. Alternately, reduce the output level (if available) of the device connected to Apollo Solo's input.*

## Polarity



When enabled, the polarity (aka “phase”) switch is yellow and the input channel's signal is inverted. Polarity affects the Mic, Line, and Hi-Z inputs.

**Tip:** *Polarity inversion can help reduce phase cancellations when more than one microphone is used to record a single source.*

## Console Plug-In Insert Controls

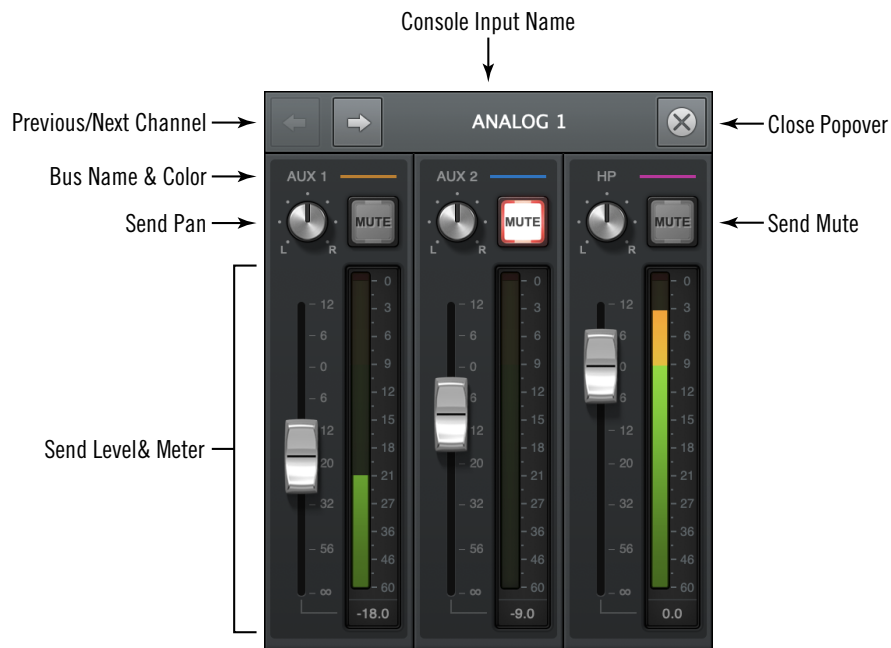
All Console plug-in insert slots operate the same way. For complete details on all insert functionality and operations, see [Console Plug-In Inserts](#).



*Console's  
plug-in inserts*

## Sends Popover

The Sends popover window is where all available sends for an individual channel can be adjusted. To access the Sends window, click the Sends display when Overview is active. See the [Sends Overview](#) for related information.



*Sends popover*

### Sends Popover Window Descriptions

**Input Name** – The name of the Apollo Solo input is displayed as the window’s title. If the input label is customized in Console, the custom name is displayed here.

**Previous/Next Channel** – These buttons switch the window to display the sends of adjacent channels. The “Command/Ctrl+Left/Right Apollo Solo” keyboard shortcut can also be used to navigate channels.

*Tip: To prevent the window from moving when these buttons are used, drag the Sends window to any location other than its default position.*

**Bus Name & Color** – The bus name and its color are displayed above each send.

*Tip: If the HP bus color is gray, the HP cue’s SOURCE is set to MIX in the CUE OUTPUTS popover.*

**Send Pan** – Adjusts the input’s position in the stereo field of the send bus. The pan knobs are not displayed when the input is in stereo linked mode, which forces the stereo channels to automatically pan hard left/right.

**Send Mute** – The Mute button can be used to disable/re-enable the bus send. When the send is active, the button is lit.

**Send Level** – This fader adjusts the input channel’s signal level sent to the bus.

**Send Meter** – The post-fader signal level of the Send is displayed here.

## Monitor Mix Controls

The monitor mix controls within the input channel strips are for adjusting the signals at Apollo Solo's monitor outputs.

**Note:** Refer to the illustration at right for descriptions in this section.

### Input Pan

This control adjusts the input's position in the stereo panorama of the monitor mix bus.

### Stereo Input Pan

When an input is stereo linked, two pan knobs appear for the channel, enabling independent panning for both the left and right channels. When stereo link is activated, the default position of the dual pan knobs are hard left/right.



*Pan with channels unlinked (left) and linked (right)*

### Input Solo

Solo mutes all input signals, except for any inputs in solo mode. Solo is used to hear individual channels in the monitor mix without having to modify other channels.

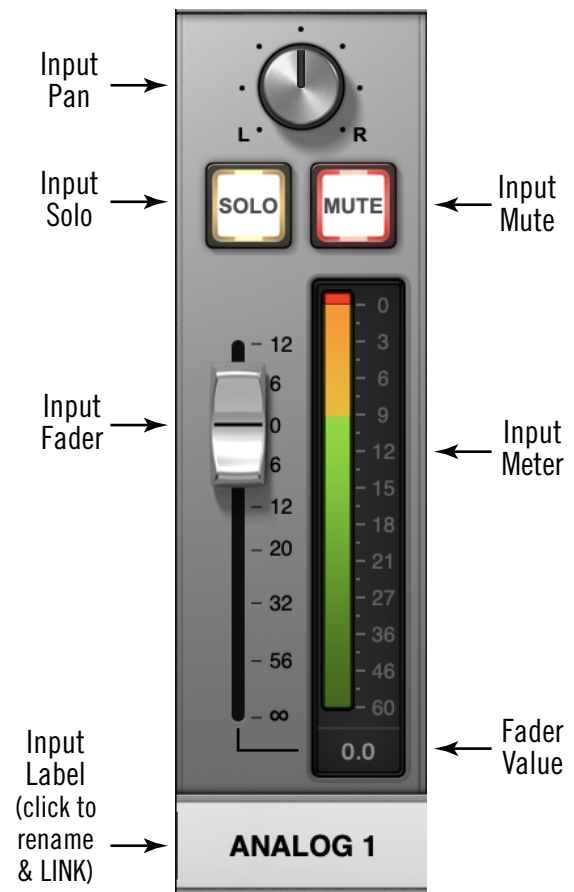
**Note:** Input solo does not affect the channel's HP cue send, which is pre-fader.

Click the switch to toggle the solo state. The channel is in solo mode when its solo switch is highlighted in yellow. Note that activating mute has no effect if the channel is in solo mode.

**Tip:** Option-click the solo button to toggle solo on all input channels.



*Inactive solo and mute switches*



*Monitor Mix Controls*



## Input Mute

Mute prevents the input channel's signal from being routed to the monitor mix bus (and aux buses that are in POST mode), but not the HP cue mix bus.

Click the button to toggle the mute state. The channel is muted when its mute switch is highlighted in red.

**Tip:** Option-click the mute button to toggle mute on all input channels.

The input meter is still active when the channel is muted for a visual reference that there is still a signal coming into the channel, even though it isn't heard in the monitor mix.

**Note:** Input mute does not affect the channel's HP cue send, which is pre-fader. The cue send has its own mute switch.

If Solo is activated on the same channel when muted, the mute state is overridden and the channel is heard in the monitor mix.

## Input Fader

This is the channel's main signal level control for the monitor mix. Changes to this control are reflected in the channel's level meter.

The input fader adjusts the channel's level in the monitor mix bus (the monitor outputs) and the aux mix buses (when set to POST mode), but not the cue mix buses.

## Fader Scale

The numerical labels next to the fader represent the amount of gain or attenuation applied by the fader. Up to 12 dB of gain above 0 dB is available. A value of 0 dB represents unity gain (no gain or attenuation).

## Fader Value

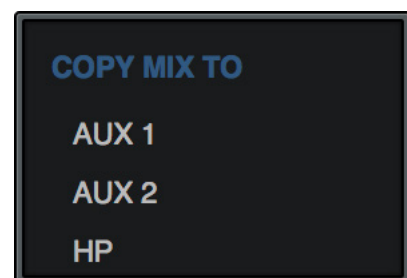
The input fader's current setting is displayed beneath the input meter.

## Copy Mix

All channel fader and pan values for all inputs (the entire monitor mix) can be copied simultaneously to any send mix bus.

To copy the monitor mix to a send mix bus, right-click (or Ctrl-click) any channel fader to display the copy mix menu, then select a destination bus for the mix.

**Tip:** This is the same function as the [Sends COPY TO Modifier](#) within the Sends View column.

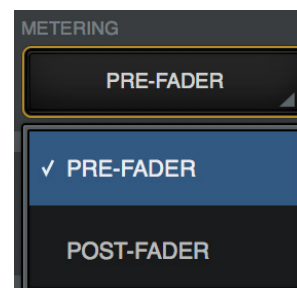


Copy Mix menu

## Input Meter

The input meter always displays the signal level of the channel *after* UAD plug-in processing in the inserts. Depending on the state of the METERING option in the Display panel within the Console Settings window, (either pre-fader or post-fader), this meter will display the level going into the monitor mix bus (post-fader/post-inserts), or the level at the channel's hardware input (pre-fader/post inserts).

**Tip:** *When recording into a DAW, it's usually best to keep metering set to PRE-FADER so the meters accurately represent the signal level at the DAW inputs when recording.*



*Pre/Post metering preference*

## Input Level Scale

The numerical labels next to the LED meters represent digital signal levels. “0” represents 0 dBFS (digital full scale, the maximum level before undesirable A/D clipping). If the level at the Apollo Solo input exceeds 0 dBFS, the meter's clip indicator illuminates.

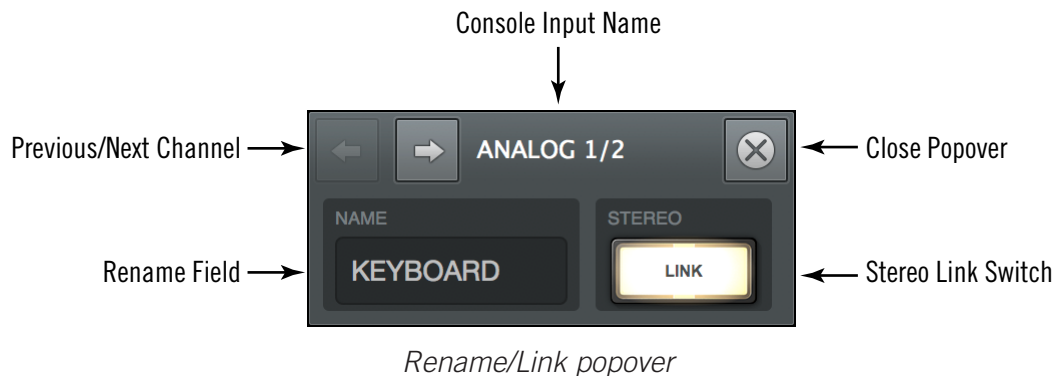
**Important:** *If clipping occurs, reduce the preamp gain, the output level of the device feeding the input, and/or the output gain(s) of UAD plug-in processing in the inserts to eliminate undesirable A/D clipping distortion.*

## Peak Hold

The input meters also have a peak hold feature, which holds signal peak values for a specified period of time. The clip and peak hold times can be adjusted in the Display panel within the Console Settings window.

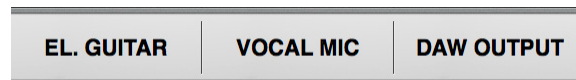
## Rename/Link Popover

The Rename/Link popover window is used for customizing input labels and stereo linking adjacent channels.



## Input Label

By default, the name of the Apollo Solo hardware input is displayed beneath the channel's fader and meter. The input labels can be customized for convenient input identification.

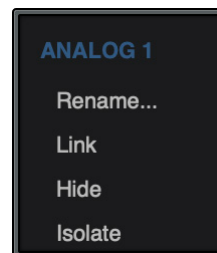


*Input labels showing customized input names*

## Input Label Menu

The Input Label Menu contains the same functions as the Rename/Link window, plus the ability to hide the input from view and Isolate the channel. To display the Input Label Menu, right-click any Input Label.

**Tip:** To re-show an input hidden via this menu, use the [Show/Hide Inputs](#) function.



### To customize a channel input name:

1. Click an input label or choose "Rename" from the Input Label Menu. The Rename/Link popover window appears.
2. Type a custom name for the input.
3. Press Return/Enter or click the close button.

### To return to the default name:

1. Click an input label or choose "Rename" from the Input Label Menu. The Rename/Link popover window appears.
2. Press the Delete key to remove the customized text from the NAME field.
3. Press Return/Enter or click the close button.

## Input label Notes

- To identify the hardware input when an input name is customized, click the input label. The hardware input name appears at the top of the Rename/Link popover.
- Input labels are stored in Console session files and the Console Recall plug-in.
- Auxiliary return labels cannot be customized.
- Custom input labels are visible within Console only.
- Input labels are not displayed within a DAW.

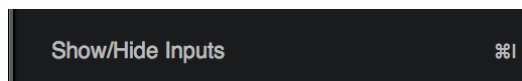
*Tip: Driver I/O labels are displayed in some DAWs and can be customized separately in the I/O Matrix panel within the Console Settings window.*

## Show/Hide Inputs

Console can hide any input channel strip from view. This feature reduces the need for horizontal scrolling when the Console window is nApollo Solo (when all visible channels don't fit) and/or reduces visual distractions when there is no need to see a particular input.

### How To Use Show/Hide Inputs

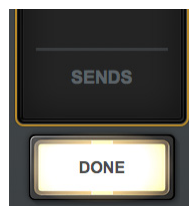
1. Either choose “Show/Hide Inputs” from the [View Menu](#), use the keyboard shortcut (Mac: ⌘+I or Win: Ctrl+I), or right-click (control-click) the [Input Label Menu](#). Modifier icons appear on all Input Labels.



2. Click or swipe across the Input Labels. The modifier toggles between green and gray. The input will be shown when its modifier is green, and hidden when gray.



3. Click the DONE switch in the View Column or use the keyboard shortcut (Mac: ⌘+I or Win: Ctrl+I). The inputs with gray modifiers are hidden. To bring hidden inputs back into view, repeat the procedure.



### Show/Hide Input Notes:

- A minimum of one input channel must be shown.
- All input channels remain active even if they are hidden from view.
- The [Show Aux Returns](#) switch is available to show/hide the aux return strips.
- Show/Hide status is stored in Console session files and the Console Recall plug-in.

## Stereo Link

Adjacent channels (analog 1+2, virtual 1+2) can be linked to create a stereo input pair. When linked as a stereo pair, any control adjustments will affect both channels of the stereo signal identically.



**Note:** Only the same type of inputs can be linked (Mic+Mic or Line+Line), and the Hi-Z inputs cannot be linked.

### Activation

Stereo pairs are created by activating LINK within the [Rename/Link Popover](#). LINK performs the exact same function pressing the LINK button on Apollo Solo's top panel when the hardware is in PREAMP mode.

**Tip:** Option-click the LINK button to stereo link all channels.

#### When Link is activated:

- The LINK switch is lit instead of gray
- One set of controls is available for the stereo channel (except pan, as noted below)
- All current control settings of the left channel are copied to the right channel (except pan, as noted below)
- All inserted plug-ins in the left channel are converted to stereo (parameter values are retained)
- Pan changes to dual (left/right) pan
- The send pan knobs are hidden (pans are forced to hard left/right with stereo sends)
- The input level meter changes to a stereo meter
- Custom input labels revert to default input labels

### Deactivation

A stereo pair is separated back into individual channels by clicking the LINK switch when it is active (the LINK switch is gray when deactivated). When LINK is deactivated, all current control settings and inserted plug-ins for the stereo channel remain on the first channel (except pan, which is centered) and the second channel reverts to a default state.



*Before and after engaging LINK*

### Link Constraints

- Only the same input jacks can be linked (for example, a Mic input cannot be linked to a Line input).
- The Hi-Z inputs cannot be linked.

# Aux Returns

## Aux Overview

Console has two stereo aux (auxiliary) mix buses. Signals are sent to the aux buses via the aux sends in Console's channel input strips. Console's aux returns are used to control and process the signals that are received from those sends.

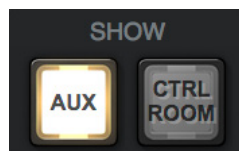
The controls in Console's aux return strips are similar to the channel input strips, but instead of controlling a channel input, they control the output of the aux mix bus. Both stereo aux returns have four plug-in inserts for Realtime UAD Processing.

The aux sends can be post-fader and post-mute (input channel faders must be raised and un-muted to be routed to the aux bus, and the send levels will reflect channel fader changes), or pre-fader and pre-mute (input channel faders and mutes do not affect the aux bus).

The aux buses in Console are designed primarily for send/return processing using UAD plug-ins. Using aux buses for effects is a great way to conserve UAD resources. For example, by using an aux for reverb processing, only one reverb plug-in is needed on the aux return instead of putting a reverb plug-in on each individual input channel.

## Show Aux Returns

By default, the aux returns are not visible. To show the aux returns, enable the AUX switch in the SHOW section of the monitor column.



*The Show Aux switch in the monitor column*



*Aux returns*

## Aux Notes

- Aux 2 is unavailable at sample rates of 176.4 kHz and 192 kHz.
- The outputs of the aux buses have 72 samples of additional latency compared to the monitor outputs. This is necessary to maintain the lowest possible latency for the dry signals.

## Aux Return Strips

Both of Console's aux return strips are identical. Most of the controls have identical functionality as their equivalent control in the channel input strips.

Refer to the diagram at right for descriptions in this section.

### Aux Inserts

The aux inserts are operated using the same methods as the insert controls in the channel input strips. See [Console Plug-In Inserts](#) for complete descriptions of the aux insert controls.

**Important:** UAD plug-in processing in the aux inserts is always routed to the DAW (if the aux buses are routed as DAW inputs), regardless of the Insert Effects setting (aux insert processing is always recorded).

### Aux HP Cue Send

The aux returns can be routed to the HP cue mix bus using the cue sends on the aux returns. There is no cue pan control on the aux returns, because the aux returns are stereo.

To send an aux signal to the HP cue mix bus, increase the HP knob in the aux return.

**Note:** When the HP Cue Source is set to HP in the CUE OUTPUTS popover, the aux return must be sent to the HP cue mix bus via this control for the aux to be heard in the cue mix.

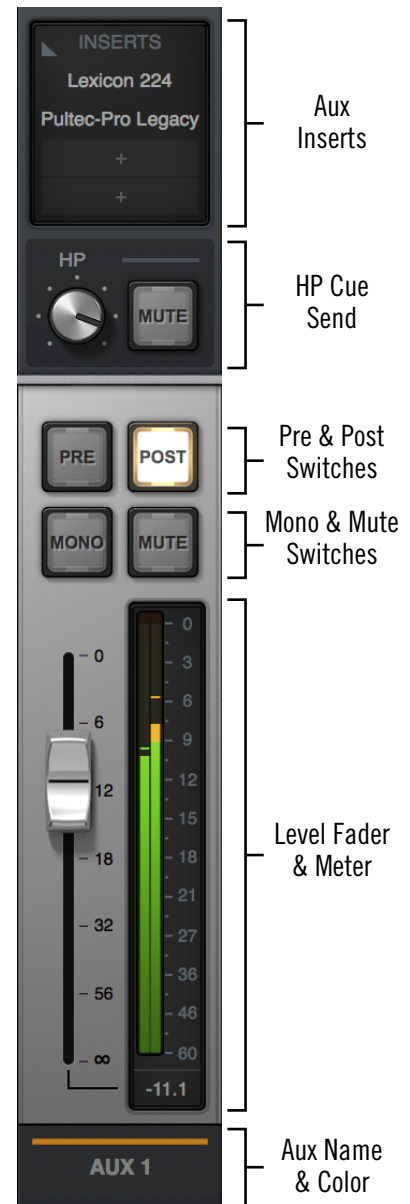
### Aux Pre

When the PRE switch is engaged (lit), the aux mix bus is pre-fader and pre-mute. In PRE mode, the input channel faders and mutes do not affect the aux bus.

**Tip:** Pre-fader mode is useful for configuring a mix bus that is independent of the monitor mix controls (for example, when creating a HP cue mix).

### Aux Post

Post-fader is the default setting for Aux 1 and Aux 2. When the POST switch is engaged (lit), the aux mix bus is post-fader and post-mute. In POST mode, the channel faders must be up and un-muted to be routed to the aux bus, and the aux send levels will reflect channel fader changes.



Aux Return Strip

***Tip:** Post-fader mode is typically used when configuring an effect send mix so the effect sends will interact with the main channel controls.*

### **Aux Mono**

This switch sums the left and right channels of the stereo aux mix bus output into a monophonic signal. The aux return output is stereo when the button is gray and mono when the button is lit.

### **Aux Mute**

The aux mute switch stops the aux return's signal from being routed to the monitor mix. The aux return output is active when the button is gray and muted when the button is lit.

***Note:** Aux mute does not mute the aux's HP cue send.*

### **Aux Fader**

This is the master signal level control for the aux bus return to the main monitor mix. It does not affect the aux bus return's cue send. Up to 12 dB of gain above 0 dB is available.

### **Aux Meter**

The input meter always displays the signal level of the aux return *after* UAD plug-in processing in the aux inserts. Depending on the state of the METERING option in the Display panel within the Console Settings window (either pre-fader or post-fader), this meter will display the level going into the monitor mix bus (post-fader/post-inserts), or the level of the aux mix bus (pre-fader/post inserts).

***Tip:** When recording into a DAW, it's usually best to keep metering set to PRE-FADER so the meters accurately represent the signal level at the DAW inputs when recording.*

### **Input Level Scale**

The numerical labels next to the LED meters represent digital signal levels. "0" represents 0 dBFS (digital full scale, the maximum level before undesirable A/D clipping). If the level at the aux bus exceeds 0 dBFS, the meter's clip indicator illuminates.

***Important:** If clipping occurs, reduce the aux send levels from the input channels and/or the output gain(s) of UAD plug-in processing in the aux inserts.*

### **Peak Hold**

The aux meters also have a peak hold feature, which holds signal peak values for a specified period of time. The clip and peak hold times can be adjusted in the Display panel within the Console Settings window.



# Monitor Column

The Monitor Column is always visible at the right side of the Console window. The Monitor Column contains elements related to monitor outputs, cue outputs, insert effect printing, and session file management.

Refer to the illustration at right for descriptions in this section.

**Note:** Settings in the Monitor Column are global functions. They are not saved with individual Console sessions files.

## Monitor Meters

These meters display the levels of Apollo Solo's monitor mix bus. Levels displayed here mirror the state of the Monitor 1 – 2 LED meters on Apollo Solo's top panel.

These meters are before the monitor output level control (pre-fader) and reflect the level of the D/A converters at the monitor outputs.

**Important:** If clipping occurs, reduce levels feeding the monitor bus by lowering the channel faders and/or output gain(s) of UAD plug-ins within Console to eliminate undesirable D/A clipping distortion.

## Meter Source

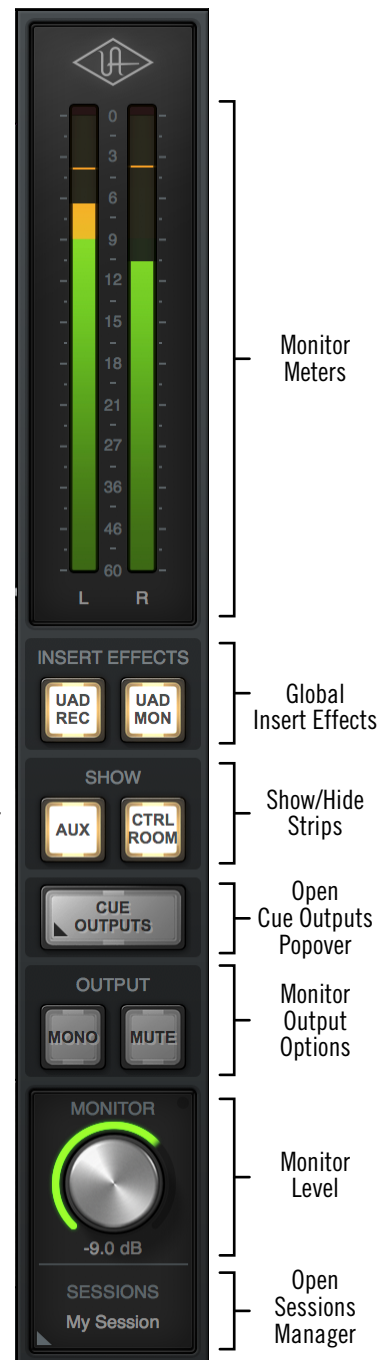
When the monitor output signals are changed with the [Monitor Output Options](#), the levels displayed by the monitor meters reflect the changed monitor outputs source signal.

## Monitor Level Scale

The numerical labels represent digital signal levels. “0” represents 0 dBFS (digital full scale, the maximum level before undesirable D/A clipping). If the level of the monitor bus exceeds 0 dBFS, the meter's clip indicator(s) illuminates.

## Peak Hold

The monitor meters have a peak hold feature, which holds signal peak values for a specified period of time. The clip and peak hold times can be adjusted in the Display panel within the Console Settings window.



Monitor Column

## Global Insert Effects

These buttons globally switch all Console inserts to either pass all UAD insert effect processing to the DAW (print wet) or not (monitor wet but print dry). See the [Insert Effects Overview](#) additional details.

Insert Effects can also be individually switched on a per-channel basis (see [Channel Insert Effects](#)). The Global Insert Effects switches override all the individual Channel Insert Effects settings.

**Important:** UAD plug-in processing in Console's Unison and auxiliary inserts is always routed to the DAW (when recording the AUX channels), regardless of the current Insert Effects setting (Unison and aux insert processing is always recorded).

### UAD REC (print all wet)

When this switch is lit RED and the UAD MON switch is off, all insert effects on all channels are routed to the DAW.



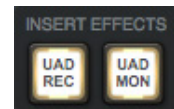
### UAD MON (print all dry)

When this switch is lit BLUE and the UAD REC switch is off, no insert effects on any input channels are routed to the DAW (except Unison and aux processing, which is always recorded).



### Both UAD REC and UAD MON (print wet and dry)

When both switches are lit YELLOW, some individual channels are recorded with insert processing and some are recorded dry, as determined by the [Channel Insert Effects](#) switches. Clicking one of the global insert effects switches will override the individual channel insert effects settings.



## Show Strips

These switches show and hide the visibility of the auxiliary return strips and/or the control room options strip. By default, these strips are not visible. The strips are visible when its SHOW switch is lit.



The SHOW switches off (left) and on (right)

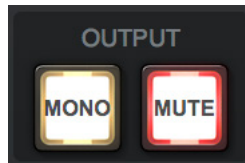
## Cue Outputs Menu

Clicking this switch opens the CUE OUTPUTS popover where the headphone output source (either the MON mix or the HP mix) is selected.

For complete details, see [Cue Outputs Popover](#).

## Monitor Output Options

The Mono and Mute options are controlled with the switches in the OUTPUT section.



### Monitor Mono

This switch sums the left and right channels of the stereo monitor mix into a monophonic signal. The monitor output is stereo when the button is gray and mono when the button is lit.

### Monitor Mute

This switch mutes Apollo Solo's monitor outputs. The monitor outputs are muted when the switch is lit. This switch performs the same function as pressing the MONITOR knob on Apollo Solo's front panel. The Monitor Level Indicator (the ring around the level knob) is red when the monitor outputs are muted.

### Monitor Level

This is the master level control for Apollo Solo's monitor outputs. It performs the same function as the MONITOR hardware knob on Apollo Solo's top panel.

**Note:** When the ring around the knob is RED, the monitor outputs are muted.

### Monitor Level Value

The *specific* monitor output attenuation value in dB is displayed beneath the Monitor Level control. The *relative* monitor output level is indicated by the colored ring around the Level control (as with the MONITOR knob's LED ring on Apollo Solo's top panel).

## Monitor Level Indicator

In addition to indicating the relative signal level of the monitor outputs, the state of other functions is indicated by the color of the ring around the monitor level control:

**Green** – The main monitor outputs are active with variable level control (normal)

**Red** – The main monitor outputs are muted

**Blinking** – The monitor DIM and/or MONO functions are active



Monitor level indications (from left to right): Normal, Mute, and DIM/MONO

## Monitor Dot

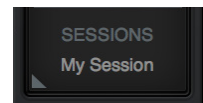
When the Monitor Level function is active on Apollo Solo's hardware (when its white MONITOR indicator is lit), a green dot is visible in Console adjacent to the MONITOR text label, as circled in red at right.

The dot provides a visual indication that the MONITOR level adjust function is active on the Apollo Solo hardware. When the dot is *not* visible, adjusting Apollo Solo's hardware level knob will not adjust the monitor level; instead, it adjusts the headphone output volume.



## Sessions Switch

The Sessions switch, located below the Monitor Level knob, is used to access the [Sessions Manager Popover](#) (single-click) or the [Sessions Menu](#) (right-click), where Console configuration preset files are managed. For complete details about these features, see [Console Sessions](#).

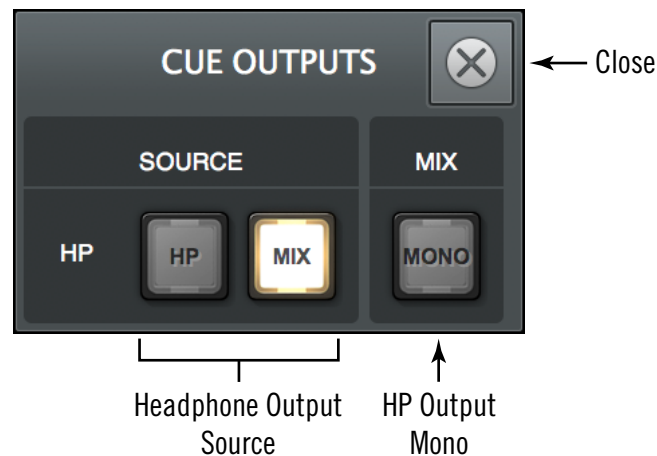


## Cue Outputs Popover

**Note:** For an overview of Apollo Solo's HP cue mix bus, see [HP Cue Overview](#).

The Cue Outputs popover window is where the source signal (either the main monitor mix or the HP cue mix) for Apollo Solo's front panel headphone jack is selected. To access the Cue Outputs Popover, click the CUE OUTPUTS button in the Monitor Column.

When Apollo Solo is connected with a Universal Audio Apollo audio interface(s), additional cue sources and destinations are available as a matrix within the Cue Outputs popover, reflecting the additional available cue mix buses and hardware outputs with an expanded I/O system.



*Cue Outputs popover*

### Cue Source Select

The HP and MIX switches select the signal source bus for the headphone output on Apollo Solo's front panel. The bus source name is on the switch. The source for the headphone output is active when its switch is lit.

The headphone output source can be either the HP cue mix bus or the main monitor mix bus. Both bus sources cannot be routed to the headphone output at the same time (the HP cue source is mutually exclusive).

**Note:** To allow selection of HP for the monitor outputs (via the control room [Monitor Source Select](#) switches), the HP source must not be set to MIX.

### MIX

When set to MIX (the default), the headphone output signal is Console's main monitor mix, summed with all DAW outputs that are routed to the monitor outs (if applicable). Console's main monitor mix faders, mutes and solos are reflected in the headphone output in this mode.

## HP

When set to HP, the headphone output source is the dedicated HP cue mix, summed with all DAW outputs that are routed to the HP outputs (if applicable).

In this mode, the mix of the HP cue bus is determined by the cue send controls in the input channel strips and the aux return strips.

Console's main monitor mix faders, mutes, and solos are *not* reflected in the headphone output when HP is selected, because Console's HP cue sends are always pre-fader.

**Note:** *When HP is the selected cue source, signals must be sent to the HP cue mix bus (via the HP cue sends) for the signal(s) to be heard in the headphone outputs.*

## Cue Output Mono

This switch sums the left and right channels of the selected stereo source bus into a monophonic signal. The headphone output is stereo when the switch is gray, and mono when it is lit.

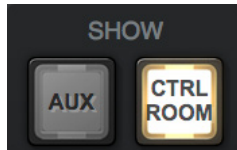
**Tip:** *This switch only controls the headphone output. To hear the HP cue mix in mono when it is routed to the monitor outputs (via the Control Room Source switches), use the [Monitor Mono](#) switch instead.*

# Control Room Column

The control room column is where various options for the monitor outputs are configured and selected.

## Show Column

By default, the control room column is not visible. To show the column, enable the CTRL ROOM switch in the SHOW section of the monitor column.



Show CTRL ROOM switch in monitor column

## DIM Controls

DIM is used to quickly reduce the listening volume in the control room by a set amount and quickly return to the prior volume.

**DIM Amount** – This control adjusts the amount of attenuation that is applied to the main monitor mix when the DIM switch is engaged. The default value is -20 dB with an available range of 0 dB to -60 dB. The DIM value is displayed below the DIM knob.

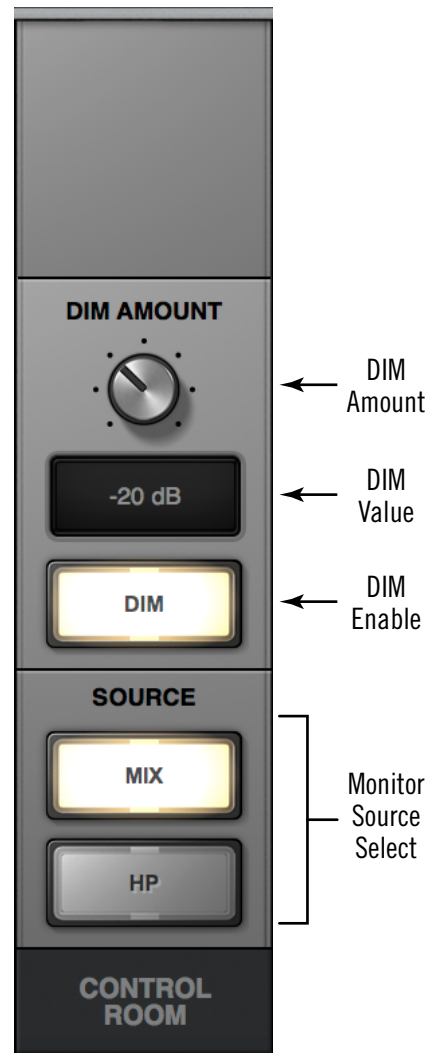
*Note:* Although displayed DIM values are continuous, the actual amount of available attenuation is stepped.

**DIM Enable** – When engaged (lit), the monitor outputs are attenuated by the DIM Amount.

*Tip:* Press DIM quickly to latch the DIM function. Press and hold DIM for 0.5 seconds to momentarily engage the function and deactivate DIM when the button is released.

## Monitor Source Select

These switches select the mix bus (either main monitor mix or HP cue mix) that is sent to Apollo Solo's monitor outputs. The output source is selected when its switch is lit.



## MIX

When MIX is selected, the main monitor mix, summed with any DAW outputs assigned monitor outputs (if applicable), is routed to the monitor outputs.

## HP

When HP is selected, the HP cue mix, summed with any DAW outputs assigned to the respective HP or LINE 3/4 outputs (if applicable), is routed to the monitor outputs.

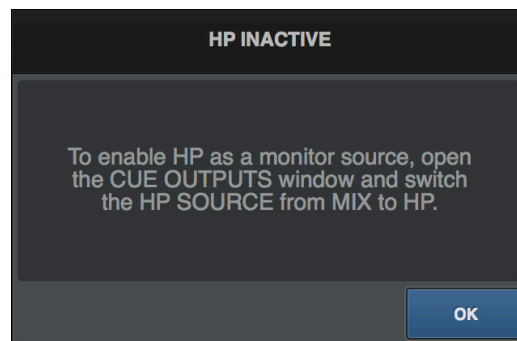
### HP INACTIVE Dialog

HP can be selected as a monitor source only if the HP source in the [Cue Outputs Popover](#) is *not* set to MIX.

Allowing those settings would be the same as simply selecting MIX as the source with the monitor source switch, except that you wouldn't be able to determine the current HP routing without opening the cue outputs window.

***If the HP INACTIVE dialog appears when attempting to enable HP as the monitor source:***

1. Close the HP INACTIVE dialog window by clicking OK
2. Open the CUE OUTPUTS popover by clicking its button in the Monitor Column
3. Switch the HP source from MIX to HP



*HP INACTIVE dialog*



## Console Sessions

The Sessions controls provide methods for managing complete Console configurations as session preset files. When a Console session file is saved, the current Console configuration is written to disk.

When a session file is subsequently reloaded, Console is returned to the exact same configuration state, regardless of any changes to Console that were made in the interim.

### Content of Session Files

Console session files contain most, but not all, Console settings. The specific parameters saved and not saved are listed below:

**Saved** – All knob, slider, and menu values, all inserted UAD plug-ins, settings contained within the plug-ins, input labels, show/hide status, and settings in Console Settings window (except those listed below).

**Not saved** – Monitor Gain, Sample Rate, Cue Outputs, and I/O Matrix settings are global parameters that are not session-specific. Most of these settings are managed in the Console Settings window.

*Tip: Core Audio / ASIO driver routes can be saved separately in the [I/O Matrix Panel](#).*

### Default Session Files Location

By default, session files are saved to, and loaded from, the user's home folder at:

- Mac: Users/UserName/Documents/Universal Audio/Sessions/
- Windows: C:\Users\UserName\AppData\Roaming\Universal Audio\Sessions

Although session files can be saved to (and loaded from) any location on disk, using the default location offers the most convenience, because Console always uses this location for the Sessions Manager window and also Open/Save dialogs presented by the OS.

*Note: Session files must reside in the default location to appear in session lists within Console.*

### Sessions Sub-Folders

The Session Files folder can contain one level of sub-folders for additional session organization capability. The contents of sub-folders (if any) are displayed in the SUB-FOLDER column in the [Sessions Manager Popover](#) when a folder in the SESSION column is selected.

### Session Files Suffix

Console's session files have the “.uadmix” suffix. The suffix is added to session files automatically when saving to disk; however, the suffix is not displayed in the file save dialog (the suffix should not be manually typed when saving a session file).

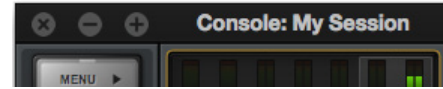
*Note: Without the .uadmix suffix, the session files will not be visible in the “Open” file dialogs or the Sessions menu, and they won't be opened when they are double-clicked in the OS file system.*

## Session Files Access

Session files can be saved and loaded via several methods: The [Modified Session Dialog](#), the File menu in the [Application Menus](#), and/or the [Sessions Menu](#).

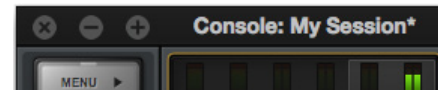
## Session Name

Session names are displayed in the [Meter Bridge](#) at the top of the main Console window (“My Session” in the screenshot at right), below the word SESSIONS within the [Settings Switch](#), and at the top of the Sessions Manager window. Session names are created when the file is saved; they can also be renamed via the OS file system.



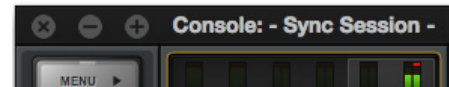
## Modified Session Name

When any Console setting is changed after the session was saved, an asterisk (\*) appears after the session name, as shown at right. This is a convenient visual reminder that the session is modified and may need to be saved for future use. To clear the asterisk, save the session.



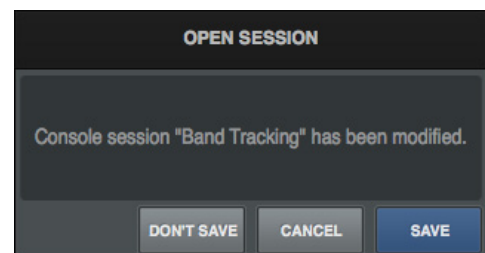
## SYNC Session Name

When a DAW project containing the Console Recall plug-in is opened that had the SYNC function in the plug-in enabled when the project was saved, the session name changes to “- Sync Session -” (as shown at right) indicating that the DAW has sent session settings to Console. See [SYNC](#) for related details.



## Modified Session Dialog

If the current Console session has been modified and a new Console session is loaded, a dialog displaying the current session name in quotes appears with option switches (the session name in quotes does *not* appear if the session has never been saved). The behavior of the option switches in this dialog are detailed below.



**Important:** This dialog does *NOT* appear when a Console session is loaded via the Console Recall plug-in’s SYNC function. See [SYNC](#) for details.

**Don’t Save** – All modifications to the current Console session are discarded and the session is loaded (or created, if creating a new session).

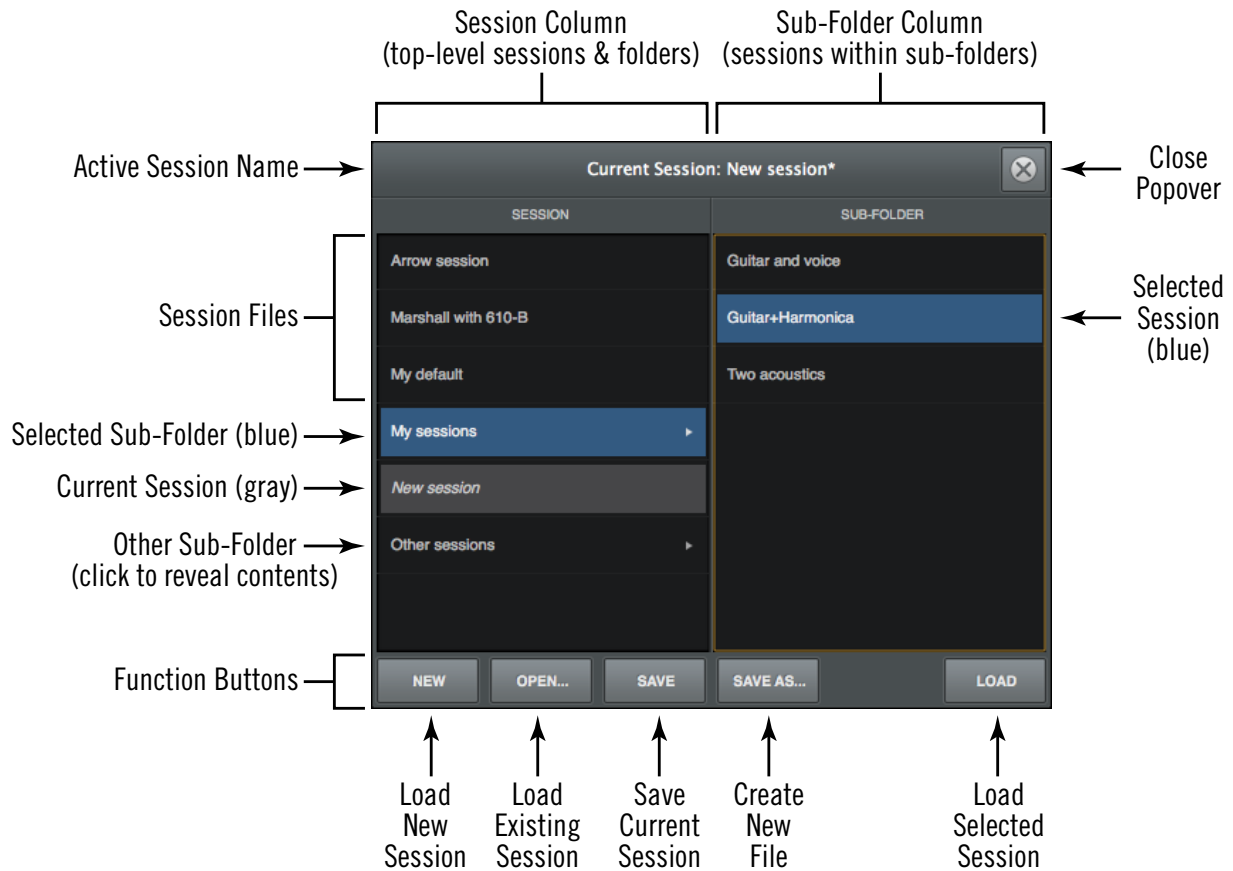
**Cancel** – The current Console session remains active and session loading is canceled.

**Save** – The current session is saved to disk and the session is loaded. If the session has never been saved to disk, this switch displays “Save As...” which opens the file save dialog.

# Sessions Manager Popover

The Sessions Manager popover window is where Console session preset files are managed. The Sessions Manager window contains the SESSION and SUB-FOLDER columns and several function switches. The columns and switches are used to navigate and manage the session files.

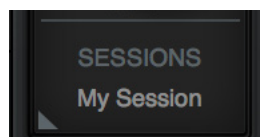
Refer to the illustration below for descriptions in this section.



*Sessions Manager popover*

## Sessions Access

To access the Sessions Manager popover, single-click the SESSIONS area at the bottom of the Monitor Column.



*Click this area to open the Sessions Manager*

## Sessions Manager Contents

Session folder contents can be organized via the OS file system. File locations in the OS are reflected within the Sessions Manager.

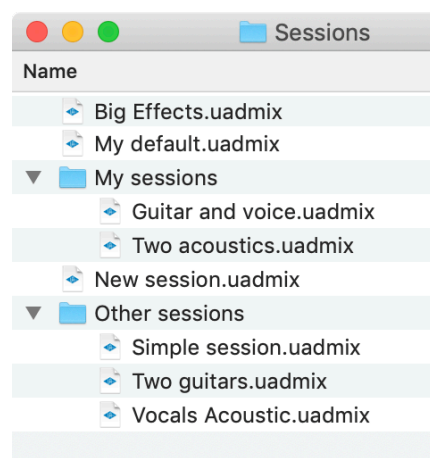
**Note:** *Reorganizing session files within subfolders can only be performed within the OS file system.*

### SESSION Column

All items within the [Default Session Files Location](#) are displayed in the SESSION column. If more sessions or folders reside in the column than are currently within view, a scroll bar appears.

Double-click any session in the SESSION column to load it, or click a sub-folder (if any) to display sessions within the sub-folder in the SUB-FOLDER column.

**Note:** *Sub-folders are indicated in the SESSION column by small disclosure triangles near the right side of the SESSION column.*



*Sessions Manager contents as seen in macOS Finder*

### SUB-FOLDER Column

If the SESSION column contains one or more folders, selecting the folder will display its contents in the SUB-FOLDER column. Double-click any session in the SUB-FOLDER column to load it.

### Sessions Manager Function Switches

The Sessions Manager contains switches that perform file management tasks. Click a switch to perform the operation on the currently selected preset or sub-folder.

**New** – Creates a new Console session with default settings (default settings cannot be changed). If the current session has been modified, a dialog appears allowing it to be saved first.

**Open...** – Opens the operating system’s standard “Open File” dialog for loading existing session files from disk.

**Tip:** *Session files can also be opened by double-clicking .uadmix files from within the operating system’s file system.*

**Save** – Saves the current modified preset file in place. If the preset was not previously saved (if the file doesn’t exist), the Save As window appears.

**Save As...** – This option opens the operating system’s standard file save dialog window so the current session can be named and saved to disk as a new session file.

**Important:** *Session settings will not be properly saved if the “/” (forward slash) or “?” (question mark) characters are in the filename. Avoid these and other special characters when saving session files.*

**Load** – Loads the session that is currently selected within the Presets Manager window (a session is selected when highlighted in blue).

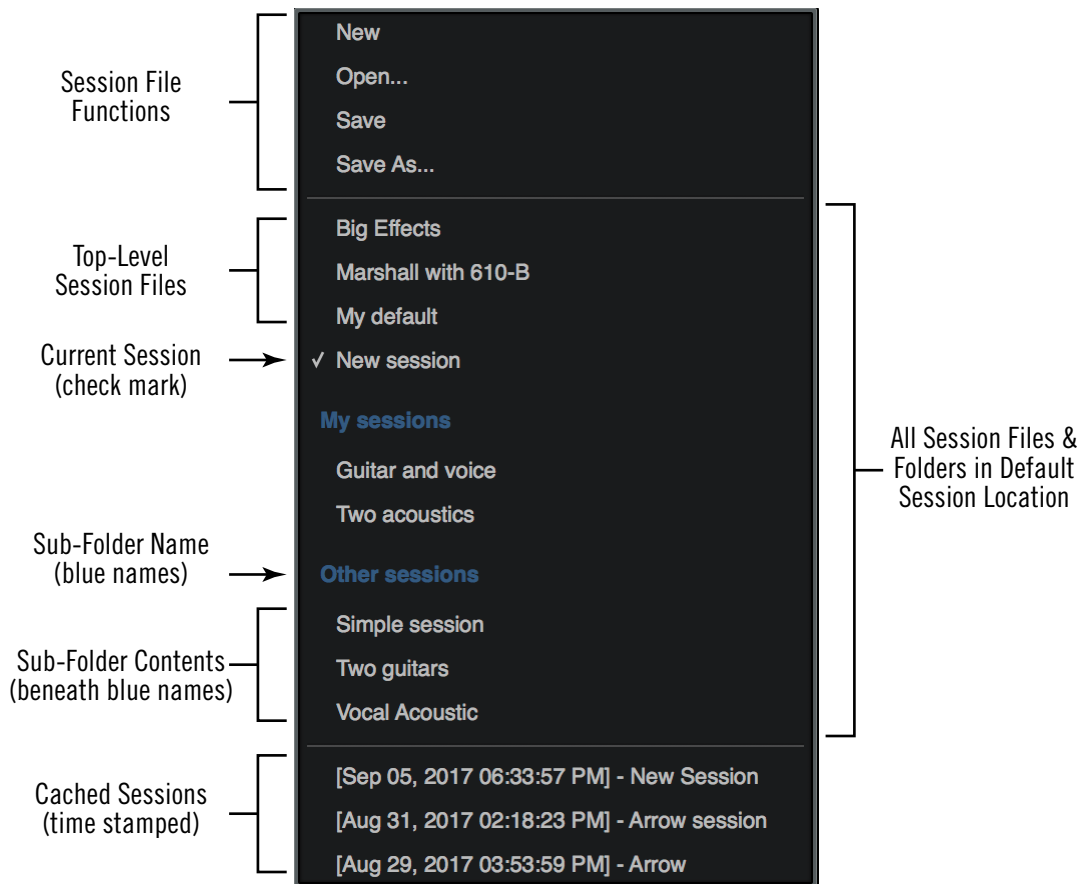
**Tip:** A session can also be loaded by double-clicking the session or typing *Return* (or *Enter*) when the session is selected.

## Sessions Menu

The Sessions Menu provides quick access to sessions functions without opening the Sessions Manager. Click any item in the menu to perform the function.

Items in the menu are divided into three sections. File management options are in the top section, existing session files and folders that reside on disk are listed in the center section, and cached (overwritten) sessions are listed in the bottom section.

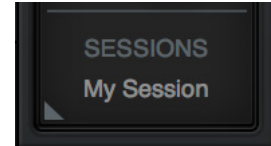
Refer to the illustration below for descriptions in this section.



Sessions Menu

## Display Sessions Menu

To access the Sessions Menu, right-click the Sessions Switch located at the bottom of the Monitor Column, as shown at right. When the menu is displayed, clicking an item in the menu chooses that item.



## Session File Functions

The New, Open, Save, and Save As functions listed here have the same functionality as the [Sessions Manager Function Switches](#).

## Sessions List

Existing session files that reside in the [Default Session Files Location](#) are displayed in the center section of the sessions menu. (Session names in diagram are examples only.)

Select a session from the list to load the session file. If the current session has been modified, the Modified Session Dialog appears.

**Note:** Session files must reside in the [Default Session Files Location](#) and have the `.uadmix` suffix to be visible in the Session Menu.

## Sub-Folders

Sub-folder names in the Sessions Menu are displayed in blue. Session files within the sub-folder are displayed beneath the blue sub-folder name (session files not within sub-folders appear at the top of the sessions list).

## Cached Sessions

Cached sessions (time stamped) appear in the bottom section of the Sessions Menu. Cached sessions are the same as session files, except they don't reside in session files on disk. Instead, these sessions are automatically created and stored in a temporary cache.

## Why Cached Sessions Exist

When a DAW project containing the Console Recall plug-in is opened and the plug-in's SYNC function was enabled when the project was last saved, the Console settings contained in the DAW project overwrite the current Console settings. The cached sessions are used to recover the overwritten data if desired. See [SYNC](#) for details.

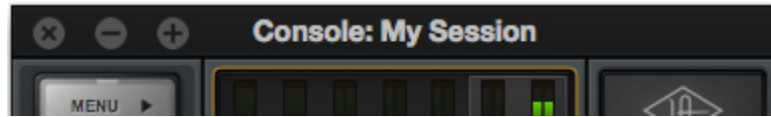
## When Cached Sessions Appear

A cached session is automatically created every time a DAW project containing the Console Recall plug-in is opened and the plug-in's SYNC function was enabled when the project was last saved. In this scenario, the SYNC function loads the Console session contained in the DAW project, and the previously-active Console settings are moved into the cached sessions menu.

The previously-saved Console session's filename is retained in the cached session, and a time stamp is prefixed so it can be easily distinguished from other sessions. The five most-recently cached sessions appear in the list.

## Window Title Bar

The Window Title Bar is the topmost strip in the Console and Console Settings windows, as shown below.



*The Window Title Bar*

**Window Name** – In the main Console window, the current session filename is displayed in the title bar. If the session has not yet been saved to disk, “Console” is displayed here.

**Close** – Clicking the “x” button closes the Console or Console Sessions window. If the window is the last open window in the application, Console is quit.

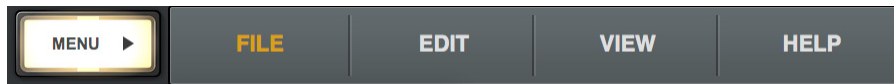
***Note:** Console’s current settings are saved to disk when quit. When Console is subsequently launched, those settings are transferred to Apollo Solo.*

**Minimize** – Clicking the “-” button reduces the window to the Dock (Mac) or Taskbar (Windows). The window can be restored by clicking the minimized window, or any method detailed in [Accessing Console](#).

**Zoom** – Clicking the “+” button expands the Console window to the maximum size available on the screen.

# Application Menus

Various Console functions can be accessed from the Application Menus. Selecting an item from the drop menu performs the function.

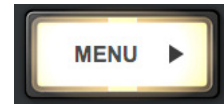


Console's Application Menus

*Tip:* Many menu functions can also be accessed using the [Keyboard Shortcuts](#) shown next to the item in the menu.

## Menu Button

The Menu button displays the application menus. The button is located at the upper left of the main Console window, at the top of every View Column.



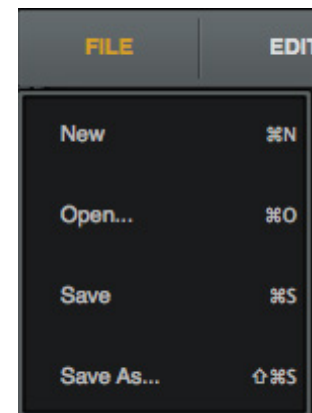
## File Menu

### Session Files Location

By default, all Console session files are stored at the following location within the OS file system (the same location used by the [Sessions Manager Popover](#)):

- Mac: Users/UserName/Documents/Universal Audio/Sessions/
- Windows: C:\Users\UserName\AppData\Roaming\Universal Audio\Sessions

*Tip:* Console sessions can be organized via the operating system's file manager. File locations in the OS are reflected within the Sessions Manager.



### New

Creates a new Console session with default settings (default settings cannot be changed). If the current session has been modified, a dialog appears allowing you to save it first.

### Open...

Opens the operating system's standard "Open File" dialog for loading existing session files from disk.

Session files can also be opened by double-clicking .uadmix files from within the OS file system.



## Save

If a session file was previously saved, selecting this option writes the current settings to the file with the same name, overwriting the previously saved file.

If the current session has never been saved, the operating system's standard "Save File" dialog appears so a new session file can be named and saved to disk.

## Save As...

This option opens the operating system's standard "Save File" dialog so the current session can be named and saved to disk as a new session file.

**Important:** Session settings will not be saved if the "/" (forward slash) or "?" (question mark) characters are in the filename. Avoid these and other special characters when saving session files.

## Edit Menu

**Note:** See [Multiple Undo/Redo](#) for an overview of Undo/Redo.

### Undo

When a parameter value in the Console window is edited, the change can be reverted with the Undo command. By executing Undo again, edits can be stepped backwards repeatedly.

The number of Undo steps is essentially unlimited. The Undo cache is active until a new or different session is loaded or Console is quit.

### Redo

When the Undo function (above) is executed, the original edit can be restored with the Redo command. By executing Redo again, previous Undo's can be restored repeatedly.

The number of Redo steps is essentially unlimited. The Redo cache is active until a new or different session is loaded.

### Remove All

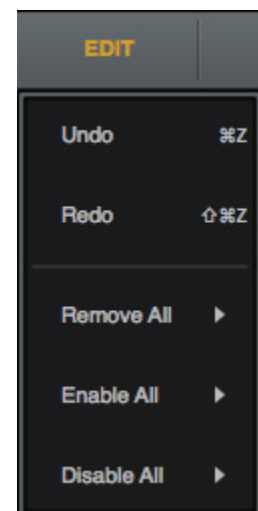
All plug-ins can be categorically deleted from Console by selecting an item from the sub menu.

### Enable All

All plug-ins can be categorically enabled from Console by selecting an item from the sub menu.

### Disable All

All plug-ins can be categorically enabled from Console by selecting an item from the sub menu.



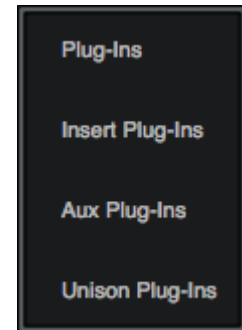
## Remove/Enable/Disable Sub-Menu

**Plug-Ins** – The function is performed on all Console plug-ins.

**Insert Plug-Ins** – The function is performed on all channel insert plug-ins. Aux and Unison plug-ins remain inserted.

**Aux Plug-Ins** – The function is performed on all auxiliary plug-ins. Channel and Unison plug-ins remain inserted.

**Unison Plug-Ins** – The function is performed on all Unison plug-ins. Channel and aux plug-ins remain inserted.



## View Menu

### Show/Hide Items

#### Show/Hide Aux Returns

Shows the aux returns when they are hidden, and hides them when they are visible. This item performs the same function as the [Show Aux Returns](#) switch in the monitor column.

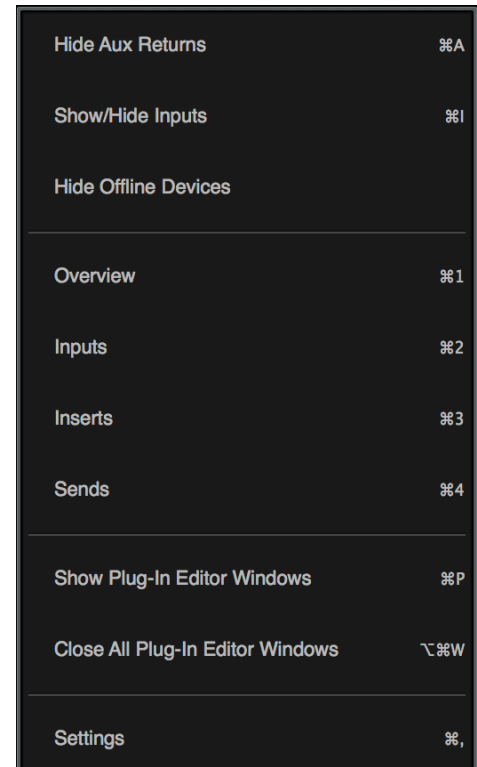
#### Show/Hide Inputs



Allows unused Console inputs to be hidden from view. For details, see [Show/Hide Inputs](#).

#### Show/Hide Offline Devices

Shows offline devices when they are hidden, and hides them when they are visible. This feature is typically used for adjusting Console sessions in multi-unit configurations when all devices are not currently connected.



### View Items

**Note:** Items in this section perform the same function as clicking the View switches in the View column.

**Overview** – Switches Console to Overview view.

**Inputs** – Switches Console to Inputs view.

**Inserts** – Switches Console to Inserts view.

**Sends** – Switches Console to Sends view.

## Show Plug-In Editor Windows

Brings all open UAD plug-in editor windows to the foreground (if any). If ALWAYS ON TOP in the Display panel within the Console Settings window is set to PLUG-INS, this function has no effect (plug-in editors are always in the foreground in this mode).

**Note:** This function applies only to UAD plug-ins inserted in Console, not those inserted in a DAW.

## Close All Plug-In Editor Windows

Closes all open UAD plug-in editor windows (if any).

## Settings

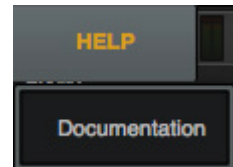
Opens the Console Settings window, where various global parameters are configured. See [Console Settings](#) for details about the window.

## Help Menu

### Documentation

This item opens the local folder containing all Apollo Solo product documentation files. Consult the documentation when you need specific operational information.

After opening the folder, double-click a documentation file to open it.



**Tip:** Use the search function within the PDF reader application to quickly find information about a particular topic.

### Contents of the documentation folder:

- Apollo Solo Manual
- UAD Plug-Ins Manual
- Direct Developer (3rd-party) plug-in manuals

The manuals below are not for Apollo Solo (the Apollo Solo Manual is self-contained):

- Apollo Software Manuals (one for each connection protocol)
- Apollo Hardware Manuals (one for each unique hardware model)

**Note:** For related information, see [About Apollo Solo Documentation](#).

# Console Plug-In Inserts

The UAD plug-in inserts within each input and auxiliary strip in Console is where UAD Powered Plug-Ins are selected and used for Realtime UAD Processing.

Both of Apollo Solo's analog preamp input channels have a dedicated Unison insert in addition to four standard inserts. Both virtual inputs, and both auxiliary returns, also have four standard inserts each. Therefore, up to five UAD plug-ins can be serially chained (stacked) per Console channel within the constraints of available DSP resources.

**Note:** Only UAD Powered Plug-Ins can be loaded in Console. However, tracks with non-UAD plug-ins used within a DAW can be routed into Console via [Virtual I/O](#).

## Insert Types

Two types of UAD plug-in inserts, Unison and Standard, are available within Console as shown at right. Additionally, a channels strip's complete plug-in setup can be saved and loaded as a channel strip.

### Unison Insert

Apollo Solo's Unison technology is active when a Unison-enabled UAD plug-in is loaded in the dedicated Unison insert located above the preamp options.

The Unison insert is available on Apollo Solo's analog preamp channels (not Virtual or AUX channels). Unison inserts are operated exactly the same way as standard inserts. See [Unison](#) for related information.

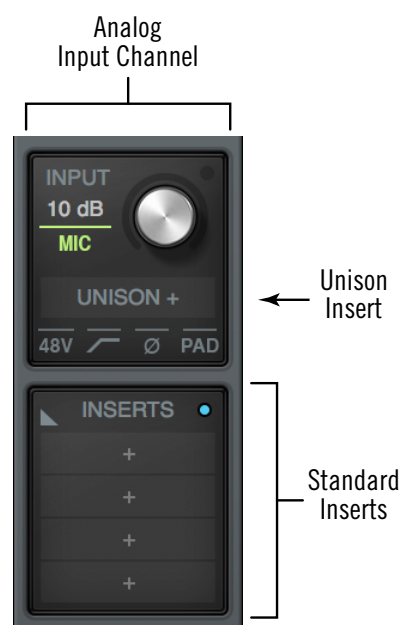
**Note:** Audio on preamp channels is processed by the Unison insert (if active) before the channel inserts.

### Standard Insert

All Console channel strips (analog, virtual, aux) have four standard insert slots.

### Channel Strip

The complete collection of UAD plug-ins within a channel's inserts, along with the settings within the plug-ins, can be saved and loaded as a single channel preset to quickly recall a complete processing setup. For details, see [Channel Strips](#).



Insert types & locations

## Inserts Signal Flow

Audio signals in a Console channel flow through the inserts serially from top to bottom. Therefore, if more than one plug-in is inserted in a channel, the location of a plug-in within the inserts processing chain can impact the sound of the channel.

*Tip: Console plug-ins can be reordered to change the serial signal processing order by dragging them to a different insert.*

## Inserting UAD Plug-Ins

To insert a UAD plug-in within Console, click the “+” symbol in any empty insert slot to display the [Insert Assign Popover](#), where individual UAD plug-ins can be selected.

## Removing UAD Plug-Ins

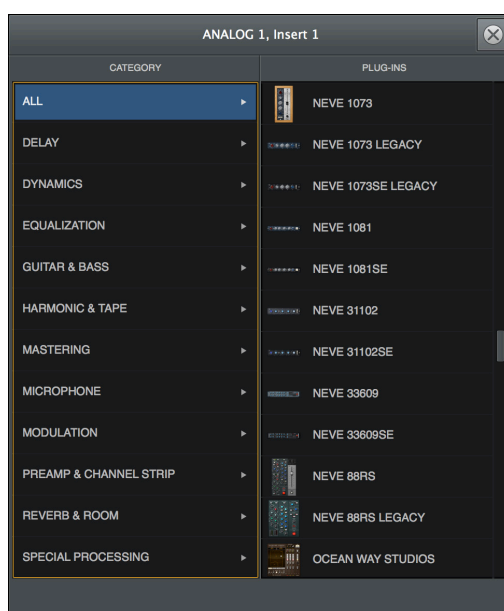
To remove UAD plug-ins from Console, right-click the insert containing the plug-in and choose Remove from the [Insert Options Menu](#), or click the Remove function icon in the [Insert Hover Options](#).

## Editing UAD Plug-Ins

If the insert already contains an assigned plug-in, clicking the insert opens the [Plug-In Editor Window](#), where plug-ins can be adjusted and/or plug-in presets can be managed.

## Insert Assign Popover

Clicking any empty insert slot displays the Plug-Ins Manager popover window. Click any UAD plug-in from any category in the popover to load the plug-in into the insert.

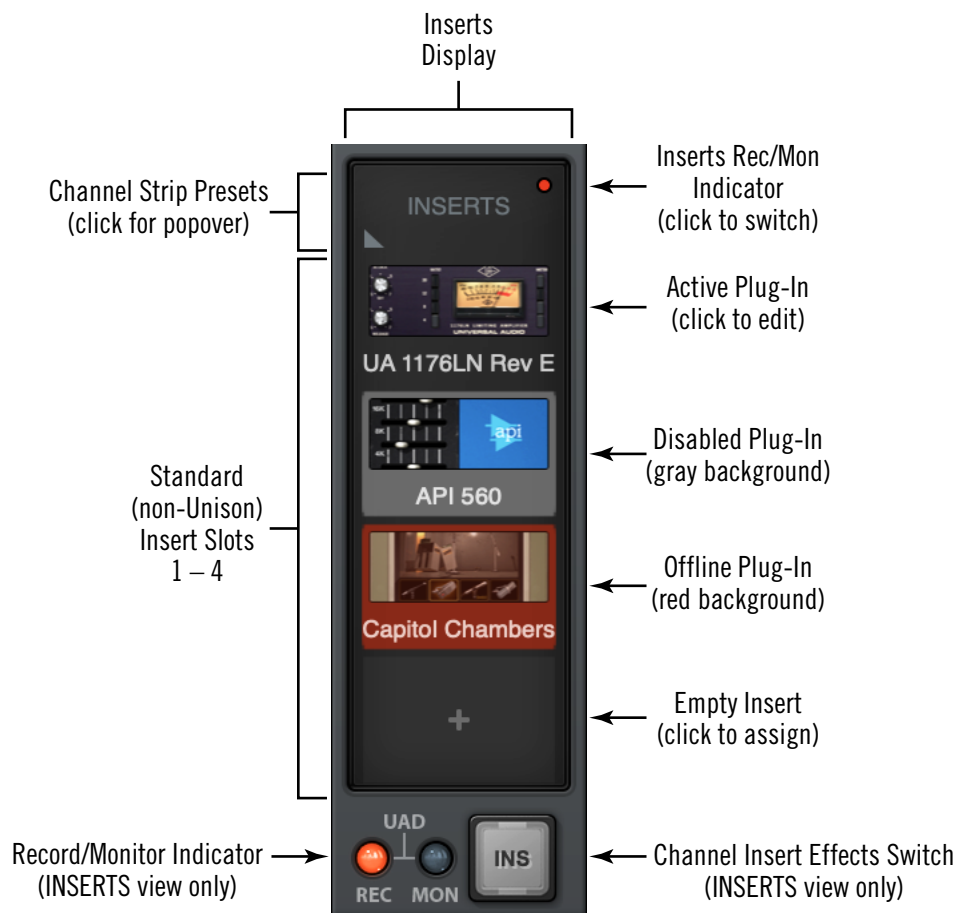


*Insert Assign popover*

# Inserts Display

The inserts display shows the name of currently loaded plug-ins (if any) and their active states. An abbreviated name may be shown for longer plug-in names due to space constraints. In expanded views, an icon representing the plug-in is also displayed.

Refer to the illustration below for element descriptions in this section.



*Standard Inserts Elements*

## Insert State Indicators

The state of a loaded plug-in within each insert can be determined by the background color of the slot. These states are defined below.

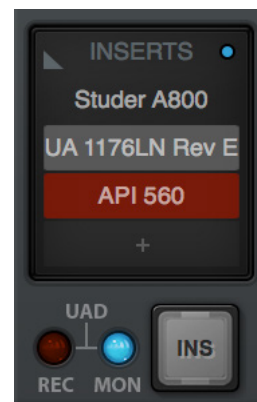
**Active (dark gray)** – The plug-in is active and processing audio. The Studer A800 plug-in insert at right indicates this state.

**Disabled (light gray)** – The plug-in has been disabled via the power switch in the header of the plug-in edit window (or via the disable function in the insert options menu). In this state, the plug-in is unloaded from the DSP, conserving UAD resources. The 1176LN plug-in insert at right indicates this state.

***Note:** Disabling a plug-in via the power control within its editor window (versus the Power switch in editor view) does not change the background color, because the plug-in remains loaded on the UAD DSP.*

**Offline (red)** – The plug-in is disabled because there are not enough UAD resources, it is unlicensed and the demo has expired or is not started, and/or the UAD authorization needs updating. The API 560 plug-in insert at right indicates this state.

**Empty (+)** – The insert is not populated with a plug-in. Click the “+” symbol to open the Assign popover for loading a UAD plug-in into the insert.



State Indications

## Insert Hover Options

When in Inserts view, commonly-used plug-in functions become available when the mouse cursor is hovered over any insert containing a plug-in.

The function icons appear on top of the plug-in name, as shown at right. To perform the function, click the associated hover switch.

**Remove** – Unloads the plug-in from the insert.

**Assign** – Opens the Assign popover to replace the current plug-in with a different plug-in.

**Power** – Disables/Enables plug-in processing and conserves UAD resources. The plug-in remains in the insert.



# Insert Options Menu

To display the Insert Options menu, right-click (or control+click) any insert.

The options available in the menu vary depending on the state of the insert (e.g., empty or loaded) and contents of the copy/paste clipboard. Each insert option is described below.

The menu has two sections under blue headings: Plug-in options that apply to the individual insert, and Channel options that apply to all inserts in the Console strip.

## Plug-In Options

*Note: All copy/paste functions also copy/paste the current settings of the plug-in.*

**Copy** – Copies the plug-in that is in the insert so it can be pasted into another insert. This option does not appear if a plug-in is not loaded in the insert.

**Paste** – Pastes a plug-in that was previously copied into the insert. This option does not appear if a plug-in was not previously copied.

**Assign** – Opens the Assign popover for selecting an insert plug-in. If the insert already contains a plug-in, the loaded plug-in is replaced with the newly-assigned plug-in.

**Remove** – Removes the plug-in from the insert.

**Disable** – Disables plug-in processing and conserves UAD resources, but the plug-in remains in the insert.

## Channel Options

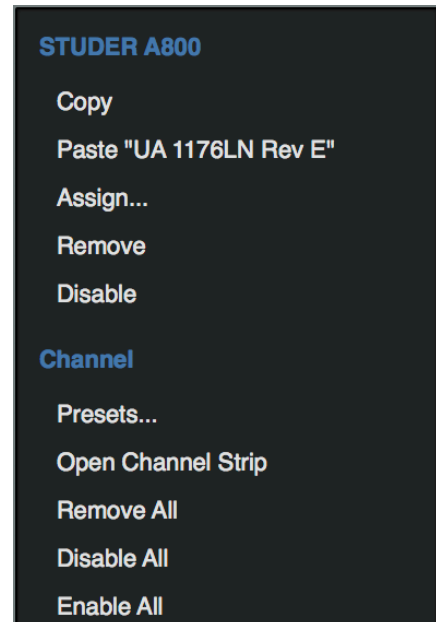
**Presets** – Opens the channel presets popover for managing channel presets.

**Open Channel Strip** – This feature groups and displays the interfaces of all plug-ins currently loaded in the standard inserts of a strip in a single window, offering a convenient method of organizing channel plug-in editors. The single window, containing up to four plug-in editors, can be moved and arranged on screen as desired in a single motion. See [Channel Strips](#) for details.

**Remove All** – Unloads all plug-ins from all standard inserts in the channel.

**Disable All** – Disables plug-in processing and conserves UAD resources for all plug-ins in the standard inserts, but the plug-ins remain in the inserts.

**Enable All** – Resumes plug-in processing for all disabled plug-ins in the standard inserts.



*Insert Options Menu*



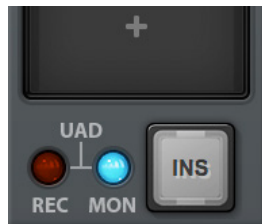
## Channel Insert Effects

**Note:** See the [Insert Effects Overview](#) for details about the REC/MON functions.

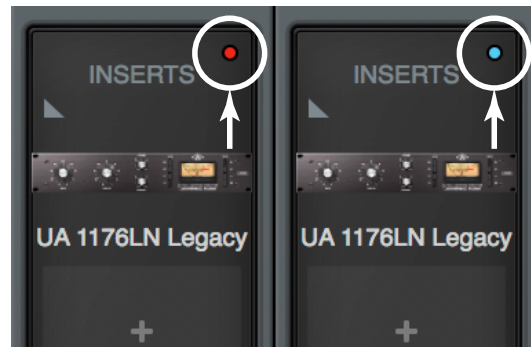
### Channel Insert Effects Switch

This switch determines whether or not Realtime UAD Processing occurring within an individual Console input is routed to its associated DAW input.

**Tip:** Insert Effects can be switched for all channels simultaneously with the [Global Insert Effects](#) switch.



Channel Insert Effects Switch  
(INSERTS view only)



Channel Insert Effects Switch  
(OVERVIEW & INSERTS views)

Two channel insert effects switches are available in Console's inputs. The large channel insert effects switch (above left) is visible when INSERTS view is selected in the View Column. A smaller switch, in the form of a colored indicator dot (above right), is available in both OVERVIEW and INSERTS views. For either type of switch, click the switch to change the REC/MON state.

### Switch Indicator Colors

**REC (print wet)** – The indicator is RED and UAD processing in all inserts in the channel is routed to the DAW.

**MON (print dry)** – The indicator is BLUE and the unprocessed signal is routed to the DAW and UAD processing is heard in monitor outputs only.

**Important:** UAD plug-in processing in Console's Unison insert(s) is always routed to the DAW regardless of the current Insert Effects setting (Unison processing is always recorded).

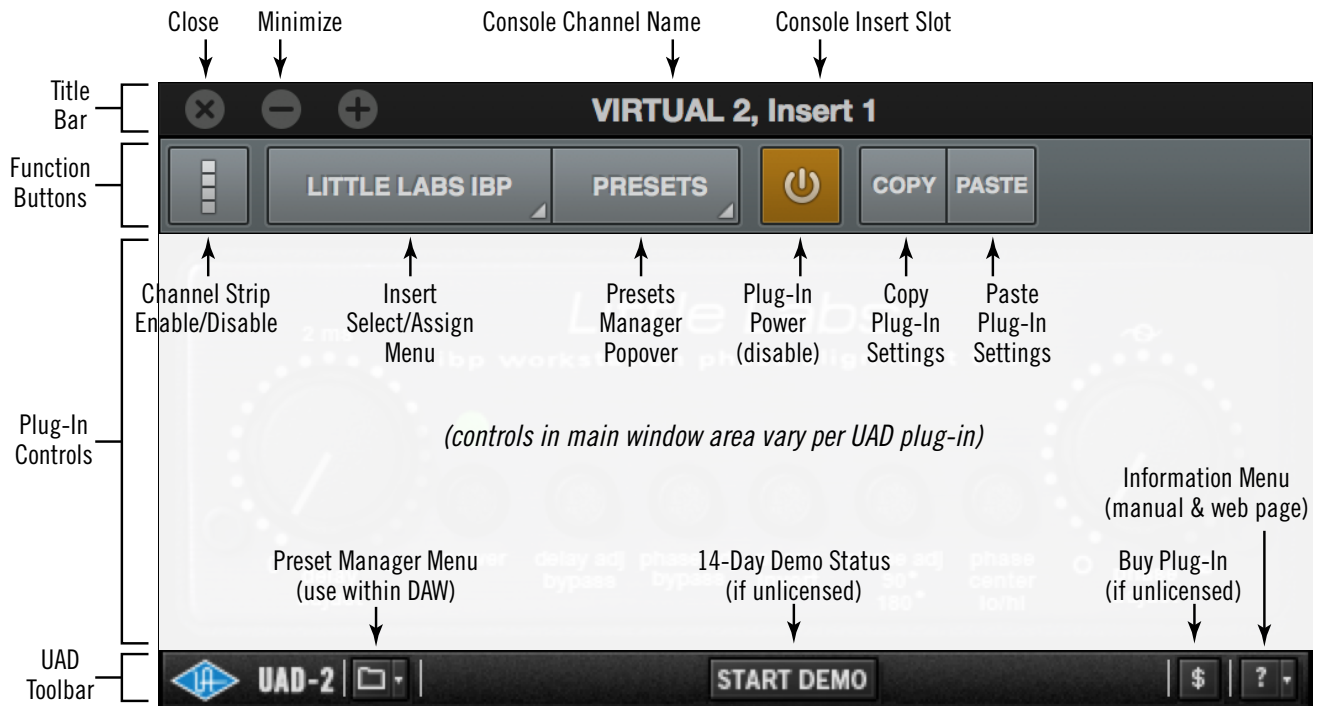
# Plug-In Editor Window

Clicking any insert that contains a plug-in opens the editor window, where UAD plug-in parameters can be adjusted and/or plug-in presets are managed.

Multiple editor windows can be open simultaneously. By default, each opened editor window is offset so one window doesn't completely cover another.

*Tip: To open each editor window at the same screen location, shift+click the insert.*

Refer to the illustration below for element descriptions in this section.



*Plug-In editor window elements within Console*

## Title Bar

The editor window's title bar is displayed at the top of each editor window.

**Console Channel Name** – The Console strip containing the insert is displayed.

**Console Insert Slot** – The insert slot number (1 – 4) or Unison is displayed.

**Close** – Closes the editor window.

**Minimize** – Minimizes the editor window by placing it in the Dock (Mac) or Taskbar (Windows). Click the minimized window to restore.

## Function Switches

The function switches are located between the title bar and the plug-in controls.

### Channel Strip Enable/Disable

This switch engages Channel Strip mode, where all UAD plug-ins within the channel inserts can be controlled within a single window. For details, see [Channel Strips](#).

### Insert Select/Assign Menu

This switch presents the Select/Assign drop menu, where a different insert within the channel can be selected for editing, or a different plug-in can be assigned to the current insert.

#### Select

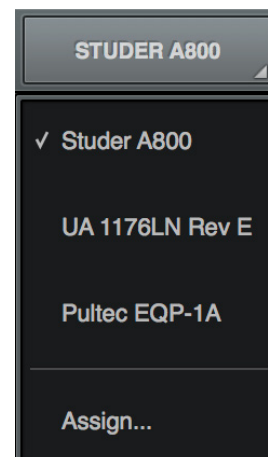
When more than one standard insert is populated in the channel, choosing a different plug-in from the menu selects that plug-in for editing within the same window.

In the example at right, three of the channel's standard inserts are populated. If only one insert is populated, only the current plug-in is displayed.

#### Assign

Choosing this menu item opens the plug-in assign popover, for replacing the plug-in currently in the insert.

**Note:** When a plug-in is replaced via the assign function, any customized settings in the replaced plug-in are lost (if they weren't saved as a preset). However, the settings can be recovered until a different Console session is loaded by using the Undo function.



Select/Assign menu

### Presets Manager Popover

This switch opens the Presets Manager popover, where plug-in settings can be saved and loaded. For details, see [Presets Manager](#).

**Note:** With nApollo Solo plug-ins, the icon at right is displayed instead of PRESETS.



### Plug-In Power

This switch deactivates the insert's plug-in by unloading it from the DSP. When deactivated, the plug-in no longer uses UAD resources.

Click the switch to change the state. The plug-in is enabled when the switch is orange, and deactivated when the switch is gray. A deactivated plug-in is indicated in the insert by a light gray background.

**Tip:** Because this function unloads and loads the plug-in from the DSP, audio artifacts can occur if the enable state is changed while audio is being processed by the plug-in. To disable individual plug-in processing without audio artifacts, use the power control within the plug-in interface instead, which keeps the plug-in loaded on the DSP.

## Copy Plug-In Settings

This switch copies the parameter settings of the plug-in to the clipboard so they can be pasted into another instance of the same plug-in.

## Paste Plug-In Settings

This switch pastes plug-in parameter settings, that were previously copied to the clipboard, into the current plug-in. If the switch is unavailable (gray), no settings are available in the clipboard or the plug-in title is different.

**Note:** Copied plug-in settings can only be pasted into the same plug-in title.

## UAD Toolbar

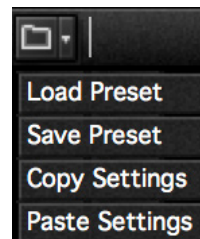
The UAD Toolbar is displayed at the bottom of each UAD plug-in, including when the plug-in is used within a DAW (outside of Console).

For complete details, see [UAD Toolbar](#).

## Preset Manager Menu

This drop menu can be used to manage UAD presets within a DAW. To manage presets within Console, use the [Presets Manager](#) instead.

**Note:** The [Presets Manager](#) is recommended for managing presets within Console (instead of the UAD Toolbar) because of its improved functionality.

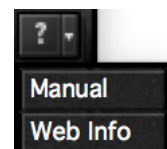


## Information Menu

This drop-menu contains two shortcuts for accessing information about the UAD plug-in.

**Manual** – Opens the UAD Plug-Ins Manual for UA-developed plug-ins, or the manual provided by the developer for 3rd-party plug-ins.

**Web Info** – Opens the default web browser and goes to the plug-in product page on the Universal Audio website (internet connection required).



## Buy Button

If the UAD plug-in is unlicensed, the “\$” button is visible, providing a fast way to purchase the license. Clicking the button launches the web browser and adds the plug-in to your cart at the UA online store.

# Channel Strips

Channel Strips are where all UAD plug-ins within a channel's four standard inserts can be displayed and controlled within a single editor window.

**Note:** *Unison plug-in editors in preamp channels are not included within Channel Strips. However, Unison plug-ins and their settings are stored within [Channel Strip Presets](#).*

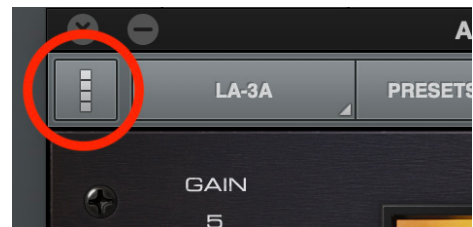


Channel Strip editor window

## Channel Strip View Enable

To merge all of a channel's standard insert plug-ins into a single window, click the Channel Strip Enable switch within any plug-in in any channel insert.

To disable Channel Strip mode and return to viewing the channel plug-ins in individual windows, click the switch again.



Click the Enable switch to activate Channel Strip view

## Channel Strip Presets

A Channel Strip preset contains all settings for all plug-ins within the channel strip. Channel strip presets are saved and/or loaded via the [Presets Manager](#).

**Note:** Channel Strip presets include all standard insert plug-ins, and the Unison plug-in (if applicable), within an individual Console channel strip.

### Accessing Channel Strip Presets

The Presets Manager for Channel Strips can be accessed with these two methods:

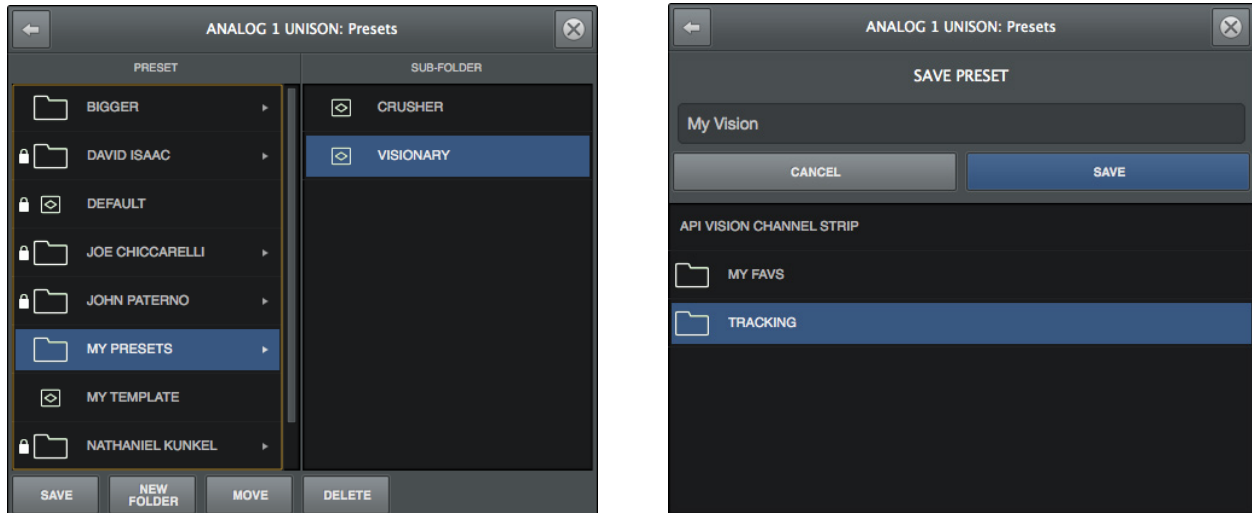
- Click the Presets Manager button (“PRESETS”) within the Channel Strip editor window. This method requires at least one plug-in to already be loaded in a standard insert.
- Click anywhere near the Channel Strip Presets disclosure triangle or the word “INSERTS” above the channel inserts in OVERVIEW or INSERTS views (as shown below). This method can be used to load Channel Strip presets when plug-ins are not yet loaded in the standard inserts.



*Click area outlined in red to access Channel Strip presets*

# Presets Manager

The Presets Manager is where individual UAD plug-in settings and Channel Strip settings are managed after a plug-in is inserted. Preset tasks are performed in the Presets Manager popovers, which are accessed from within the [Plug-In Editor Window](#).



*Presets Manager popovers*

## Presets Overview

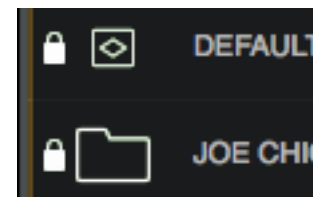
A preset is a complete collection of settings for an individual plug-in that is saved as a disk file so the settings can be subsequently recalled. Presets are typically used to save and recall favorite plug-in settings. Thousands of factory presets are installed with the software, or they can be user-created. Preset files have the “.fxp” suffix.

### Factory Presets

Factory presets are plug-in settings created by the plug-in developers for typical use case scenarios. All UAD plug-ins developed by Universal Audio include a batch of factory presets. They can be used as-is or modified as desired.

All factory presets, and factory preset folders, are read-only. They cannot be overwritten, renamed, deleted, or moved. However, factory presets/folders can be saved under a different name or in a different file location.

Factory presets/folders are indicated by a lock icon at the left of a preset or folder icon. User presets/folders do not have the icon.



*Factory preset & folder icons (indicated by lock) as they appear in the Presets Manager*

**Note:** *Not all UA Direct Developer (3rd-party) plug-ins include factory presets.*

## Presets Folder Location

All factory and user preset files for UAD plug-ins are stored at the following location within the operating system:

### **Mac:**

/Library/Application Support/Universal Audio/Presets

### **Windows:**

C:\Program Files (x86)\Universal Audio\Powered Plugins\Presets

***Tip:** User presets and folders can be organized via the operating system's file manager (i.e., macOS Finder or Windows Explorer). File locations in the operating system are reflected within the Presets Manager.*

## Plug-In's Presets Folder

Inside the Presets folder above are folders named with the title of each UAD plug-in. Each of these folders contain all factory and user presets for that particular plug-in. This is the *plug-in's presets folder*. The contents of this folder is displayed in the PRESET column within the Presets Manager.

***Note:** User presets can only be saved to the plug-in's presets folder.*

## Presets Sub-Folders

Each plug-in's presets folder can contain one level of sub-folders for additional preset organization capability. The contents of sub-folders (if any) are displayed in the SUB-FOLDER column when a folder in the PRESET column is selected.



## Channel Strip Presets

A Channel Strip preset is a complete collection of plug-ins within a single channel, and all parameter settings within those plug-ins, that is saved as a disk file so the channel strip preset can be subsequently recalled into the same or a different channel. Channel strip preset files have the “.uadchannel” suffix.

**Tip:** To activate Channel Strip view, click the Channel Strip icon in the Edit Window. Channel Strip mode is active when the switch is orange colored.



### Channel Strip Presets Folder

All Channel Strip presets reside in the *Channel Strips presets folder*. The contents of this folder is displayed in the PRESET column within the Presets Manager.

**Note:** Channel Strip presets can only be saved to the Channel Strip presets folder.

### Channel Strip Presets Folder Location

All Channel Strip files are stored at the following location within the operating system:

**Mac:**

/Library/Application Support/Universal Audio/Presets/Channel Strip

**Windows:**

C:\Program Files (x86)\Universal Audio\Powered Plugins\Presets\Channel Strip

**Tip:** User presets and folders can be organized via the operating system’s file manager (e.g., macOS Finder or Windows Explorer). File locations in the operating system are reflected within the Presets Manager.

### Channel Strip Presets Sub-Folders

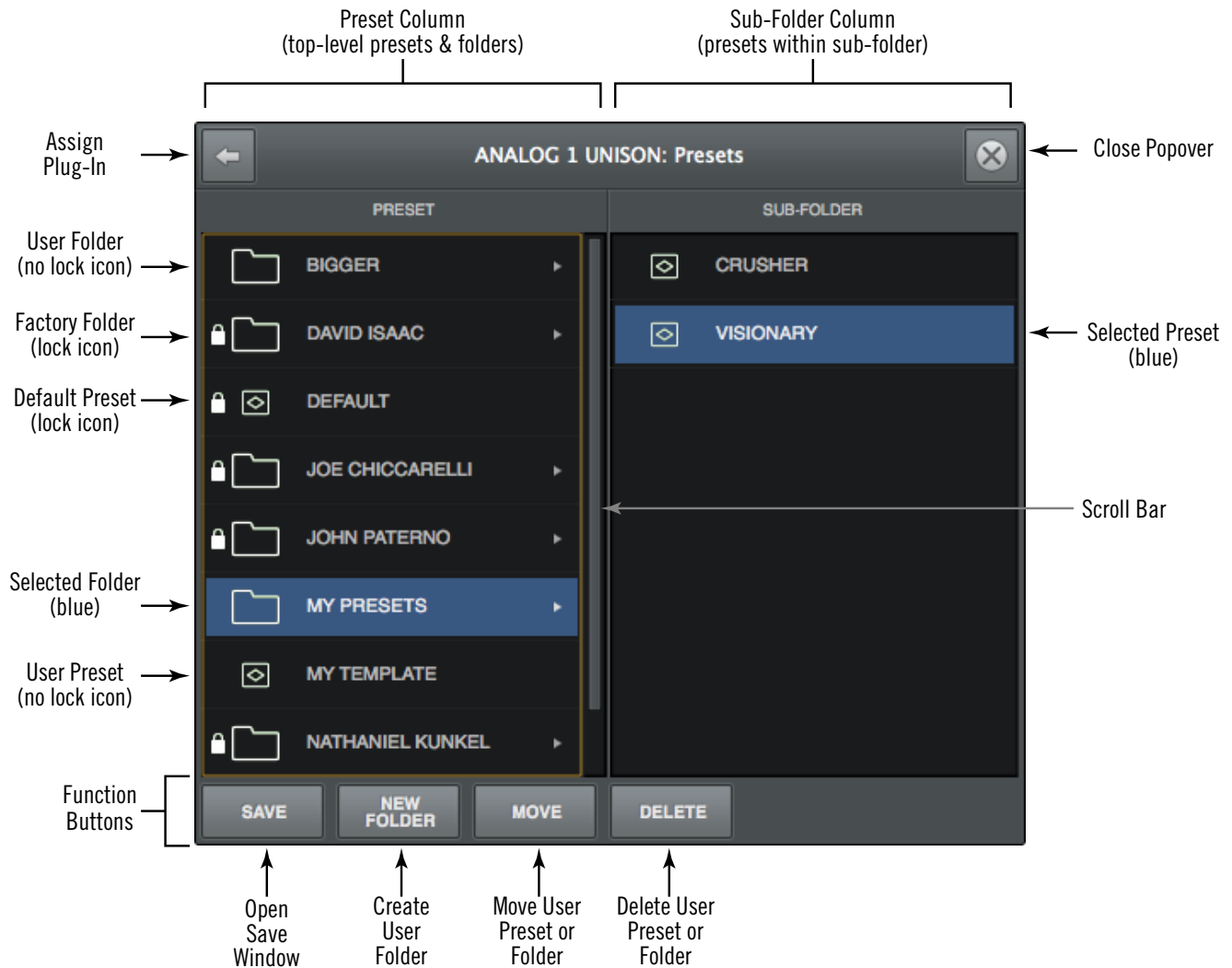
The Channel Strip presets folder can contain one level of sub-folders for additional channel strip preset organization capability. The contents of sub-folders (if any) is displayed in the SUB-FOLDER column when a folder in the CHANNEL PRESET column is selected.

# Presets Manager Popover

The Presets Manager popover window contains the PRESET and SUB-FOLDER columns and several function switches. The columns and switches are used to navigate and manage the preset files.

*Tip: Plug-in settings are loaded instantly as they are selected in the columns so you can quickly audition presets while the popover is open.*

Refer to the illustration below for descriptions in this section.



*The Presets Manager popover*

## PRESET Column

All items within the plug-in's preset folder are displayed in the PRESET column.

Click any preset in the PRESET column to instantly load it, or click a sub-folder (if any) to display presets within the sub-folder in the SUB-FOLDER column. If more presets or folders reside in the column than are currently within view, a scroll bar appears.

## SUB-FOLDER Column

If the PRESET column contains one or more folders, selecting the folder will display its contents in the SUB-FOLDER column. Click any preset in the SUB-FOLDER column to instantly load it. If more presets reside in the column than are currently within view, a scroll bar appears.

## Presets Manager Function Buttons

The Presets Manager contains switches to save, name, and perform other file management tasks. Click a switch to perform the operation on the selected (blue) preset or sub-folder.

**Save** – Saves the current modified preset file in place. If the preset was not previously saved (if the file doesn't exist), the Save window appears.

**New Folder** – Creates a new sub-folder. Sub-folders appear in the left column of the Presets Manager.

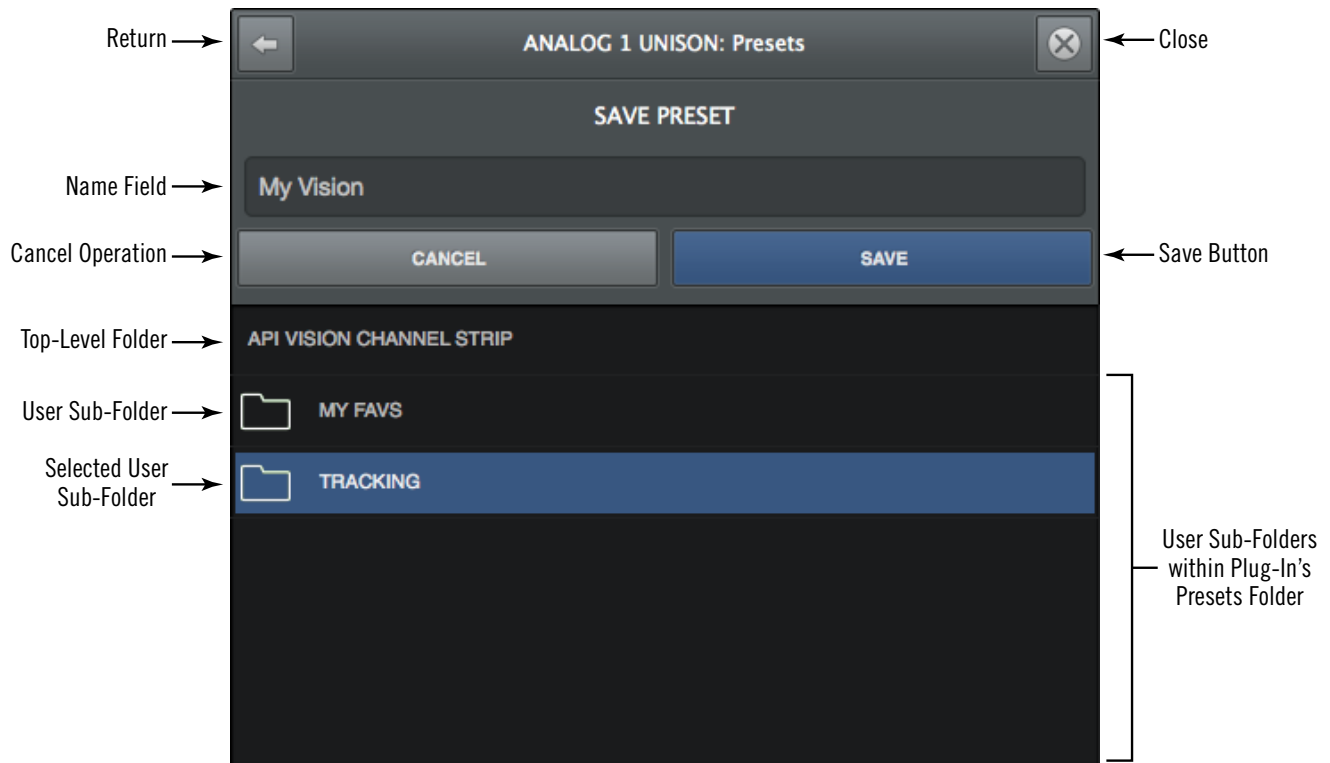
**Move** – Opens the Save window where the selected preset can be moved to a different location within the presets folder, with the option to rename the preset.

**Delete** – Deletes the selected preset file from disk and removes it from the presets list. A confirmation dialog appears before the file is deleted.

## Save Preset Popover

The Save Preset popover window is where presets and sub-folders can be named and moved. It appears when the Save or Move switches within the Presets Manager window are clicked.

Refer to the illustration below for descriptions in this section.



*The Save Preset popover*

### Save Preset Popover Functions

**Return** – Returns to the main Presets Manager popover.

**Close** – Exits the Preset Manager and returns to the Plug-In Editor window.

**Name Field** – When creating a new preset or sub-folder, enter a unique name here.

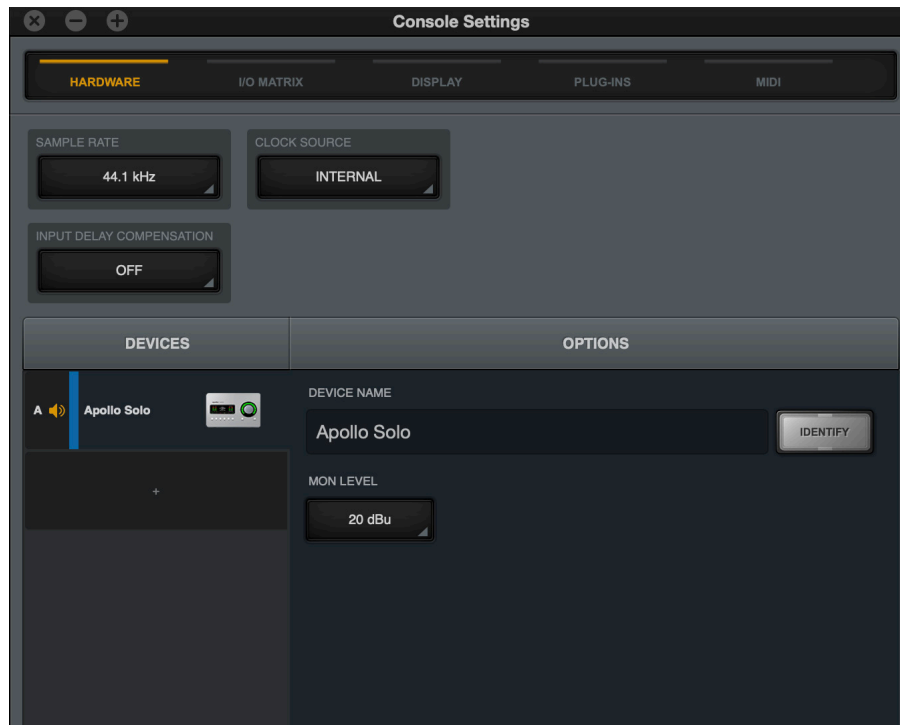
**Cancel** – Cancels the operation and returns to the main Presets Manager popover.

**Save** – Creates the disk file or sub-folder.

# Console Settings

## Console Settings Overview

Global parameters for Apollo Solo and Console are configured in the Console Settings window. All Console Settings are detailed in this chapter.

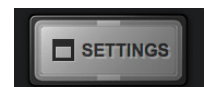


*Console Settings window*

## Accessing Console Settings

The Console Settings window can be opened using any of these methods:

- Choose View>Settings from the [Application Menus](#)
- Click the SETTINGS switch at the bottom of the [View Column](#)
- Use the command+comma (Mac) or ctrl+comma (Win) keyboard shortcuts
- (Mac) Choose Console Settings from the UA icon drop menu in the macOS Menu Bar at upper right of screen
- (Windows) Right-click the blue UA diamond logo in the Windows System Tray (in the taskbar at lower right of screen), then select Console Settings from the contextual menu



*Settings switch in View Column*

## Console Settings Panels

Controls within the Console Settings window are arranged according to related functionality. Each set of related settings are contained within a single panel. Five panels are available in the Console Settings window:

**Hardware** – Settings related to Apollo Solo hardware device setup

**I/O Matrix** – Settings related to custom driver I/O mapping

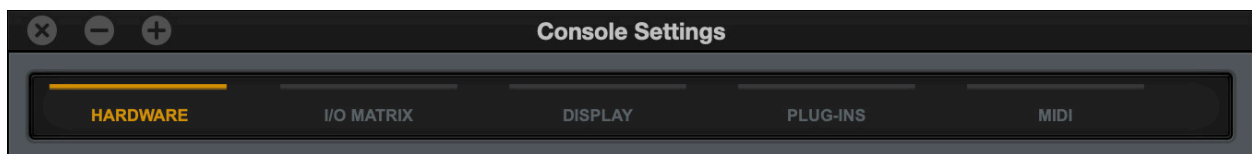
**Display** – Settings related to how and what items are displayed in Console

**Plug-Ins** – Settings related to UAD plug-ins used within Console

**MIDI** – Settings for setting up MIDI control of Tap Tempo within Console

## Accessing Settings Panels

Each of the five Console Settings panels is accessed by clicking the panel's name at the top of the Console Settings window. The panel is selected and displayed when its name is illuminated.



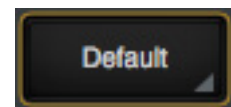
*Panel names at top of Console Settings window with HARDWARE panel selected*

## Changing Settings

Unless otherwise noted, all values within the Console settings window are changed by either choosing a different value from a drop menu, or entering a new values directly.

**Drop Menus** – Values with drop menus are indicated by a disclosure triangle at the lower right of the value field. To change these settings, click the item and choose a different value from its drop menu.

**Direct Entry** – Values with direct text or numerical entry have a lighter gray background and do not have a disclosure triangle at the lower right of the value field. To change these settings, click the field and type a new value with the keyboard, then type the Return/Enter key.



*Typical disclosure triangle*

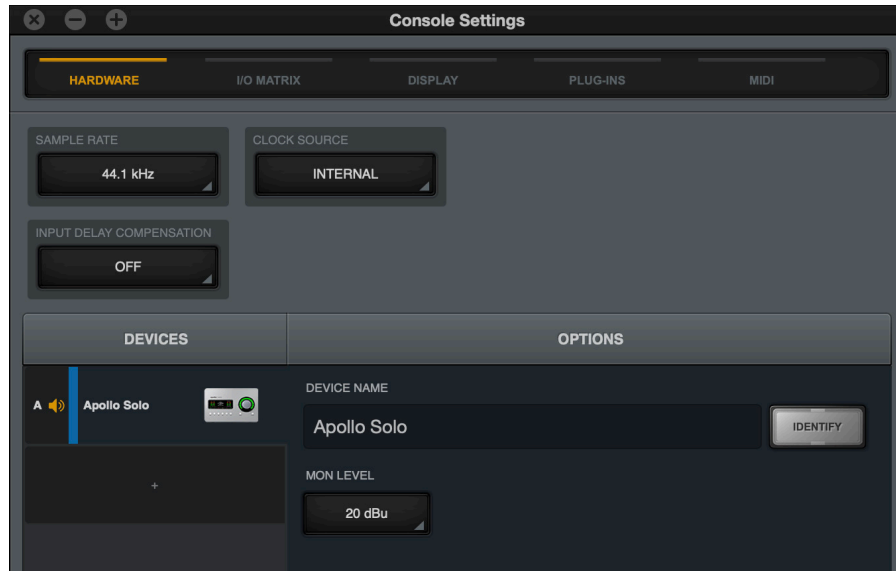
## Available Settings

The parameters that are displayed in the Console Settings window can vary if Apollo hardware model(s) are currently connected to the system.

Only settings that apply to the currently connected hardware are displayed. Any settings that are unique to a particular hardware model are noted in the descriptions.

# Hardware Settings Panel

The Hardware panel is where Apollo Solo's system-level audio interface I/O settings such as sample rate and output reference levels are configured. These settings are used by DAW applications when they are configured to use Apollo Solo as the audio interface. Even when Console is not open, these settings are stored by the Apollo Solo drivers for use by other host applications.



Hardware panel

## Sample Rate

This setting defines the sample rate that is used for Apollo Solo A/D and D/A conversion and UAD Powered Plug-Ins processing. When using UAD Powered Plug-Ins, higher sample rates require more UAD DSP resources.

**Note:** When the sample rate is changed, hardware relays that mute the outputs are temporarily engaged to prevent audio artifacts. This action causes an acoustic clicking sound that can be heard within the hardware. These clicks are by design and can be safely ignored.

## Host Control of Sample Rate

Behavior and control of the sample rate depends on the operating environment:

**Without a DAW** – Apollo Solo's sample rate is set within Console when a DAW is not used (when Console is the only host application).

**With a DAW** – The sample rate is usually changed within the DAW application's audio preferences.

**Tip:** Sample Rate can also be viewed and changed via Console's [Info Bar](#).

## Buffer Size (Windows)

**Note:** Buffer Size is available on Windows systems only. On Mac systems, the hardware I/O buffer size is set within the DAW application (except LUNA Recording System, where buffering is managed automatically).

This setting determines the hardware I/O buffer size used by a DAW. As values are decreased, DAW throughput latency decreases, but the computer's CPU load increases. Conversely, as I/O buffer size values are increased, DAW throughput latency increases, and the computer's CPU load is reduced. For related information, see [Latency Basics](#).

Available buffer size values are dependent on the current Sample Rate value. If values in the Buffer Size menu are gray and cannot be selected, change the Sample Rate value.

**Note:** If audio artifacts occur during DAW playback (clicks, pops, stuttering, etc), the buffer size may need to be increased.

**Important:** Buffer Size applies to use with a DAW only. It has no effect on Console's hardware monitoring features or Realtime UAD Processing within Console.

## Monitor Operating Level

The MON LEVEL menu switches the operating level of the monitor outputs. Available selections are 20 dBu (louder) and 14 dBu (quieter).

## Input Delay Compensation

Input Delay Compensation maintains phase alignment across Console's analog and digital inputs when certain UAD plug-ins are used. See [Input Delay Compensation in Console](#) for a complete explanation of this feature.

When enabling Input Delay Compensation, it's usually best to start with the Short value (100 samples) to minimize latency. The default value is Medium.

Input Delay Compensation Values	
Setting Name	Extra Delay (samples)
Off	0
Short	100
Medium	200
Medium-Long	300
Long	1000

**Note:** Changes to this setting do not take effect until the DAW is quit.



## Input Delay Compensation Exceeded Dialog

### Input Delay Compensation Exceeded

To maintain input phase alignment, either increase the Input Delay Compensation value in the Hardware panel within the Console Settings window, or remove some UAD plug-ins from the "ANALOG 1" input.

A dialog will appear in Console if the compensation amount is exceeded on a channel. If this occurs, either increase the IDC value or reduce the number of upsampled plug-ins in the channel to maintain phase alignment.

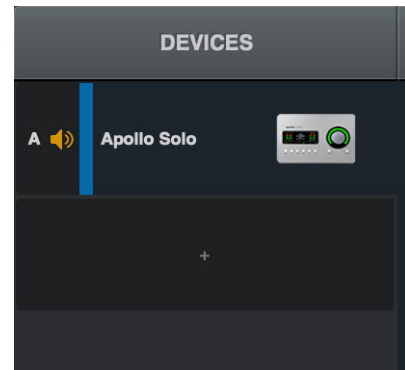
***Tip:** For the lowest possible latency if not using multiple inputs for a single source, turn Input Delay Compensation OFF. Input Delay Compensation and phase alignment is only important when multiple Console inputs are used for a single source (such as a drum kit using multiple microphones).*

## Devices Column

***Note:** The Devices Column is typically used only when more than one Universal Audio audio interface is connected to the system.*

This column lists all Apollo Solo and Apollo audio interfaces in the system. It has four primary functions:

1. Selects current unit to see device-specific options
2. Designates the monitor unit in multi-unit setups
3. Indicates which unit(s) are currently online
4. Adds devices for offline configuration



### Select Device

Clicking a unit in the column reveals its device-specific settings in the [Options Column](#).

### Device Letter

Each unit in the Devices list is designated with a sequential letter. These letters are used in the [I/O Matrix Panel](#) when multi-unit cascading to differentiate between Apollo Solo devices. The device letters cannot be modified.

### Device Color

Each unit in the Devices list is color coded for enhanced identification. These colors are used in the [Meter Bridge](#) and the [I/O Matrix Panel](#) when multi-unit cascading to differentiate between devices. The device colors cannot be modified.

## Designate Monitor Unit

In multi-unit configurations, the device at the top of the column is the designated monitor (master) unit. The monitor unit is indicated by a speaker icon between the device letter and the device name. To change the monitor unit, drag a unit to the top of the device column.

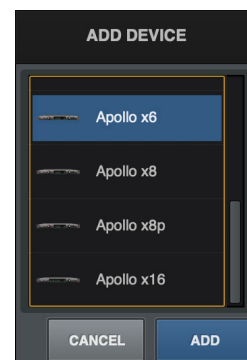
For related details, see [Expanded UAD Systems](#).

**Note:** This operation reconfigures the system. There may be a delay before the operation is completed.

## Add Device

Unit(s) can be manually added for offline configuration by clicking the “+” switch (below the devices in the column) to present the Add Device menu. Click a device in the menu to add it to the Device Column.

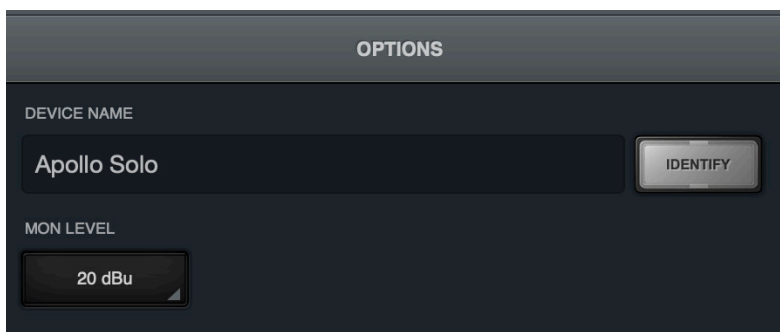
**Note:** When a device is properly connected and powered, it is automatically detected and added to the device list.



## Options Column

Selecting a unit in the Devices column reveals its device-specific settings in the Options column. A device is currently selected when its text is not dim.

**Note:** Settings in the Options Column apply only to the specific unit currently selected in the Devices Column.



*Apollo Solo device options*

## Device Name

Apollo Solo’s default device name can be changed. The device name is displayed in the “Connecting to Apollo Solo” window that appears briefly during system connection, in the I/O Matrix panel settings, and optionally in the Meter Bridge.

**Note:** Text in this field cannot be modified when the device is offline.

## Identify

Clicking the Identify switch will cause the currently selected unit's front panel LEDs to flash in a pattern. This feature is typically used with multi-unit systems to distinguish units when making I/O connections.

## Remove

In multi-unit configurations (when the device column contains more than one unit), if a device is offline, the REMOVE switch replaces the IDENTIFY switch in the options column.

Offline devices can be removed from the devices list. To remove an offline device, select the unit in the DEVICES column, then click the REMOVE switch in the OPTIONS column.

**Note:** *If an expander unit is powered down or disconnected from the system, the expander unit must be removed before the sample rate can be changed to 176.4 kHz or 192 kHz.*

# I/O Matrix Panel

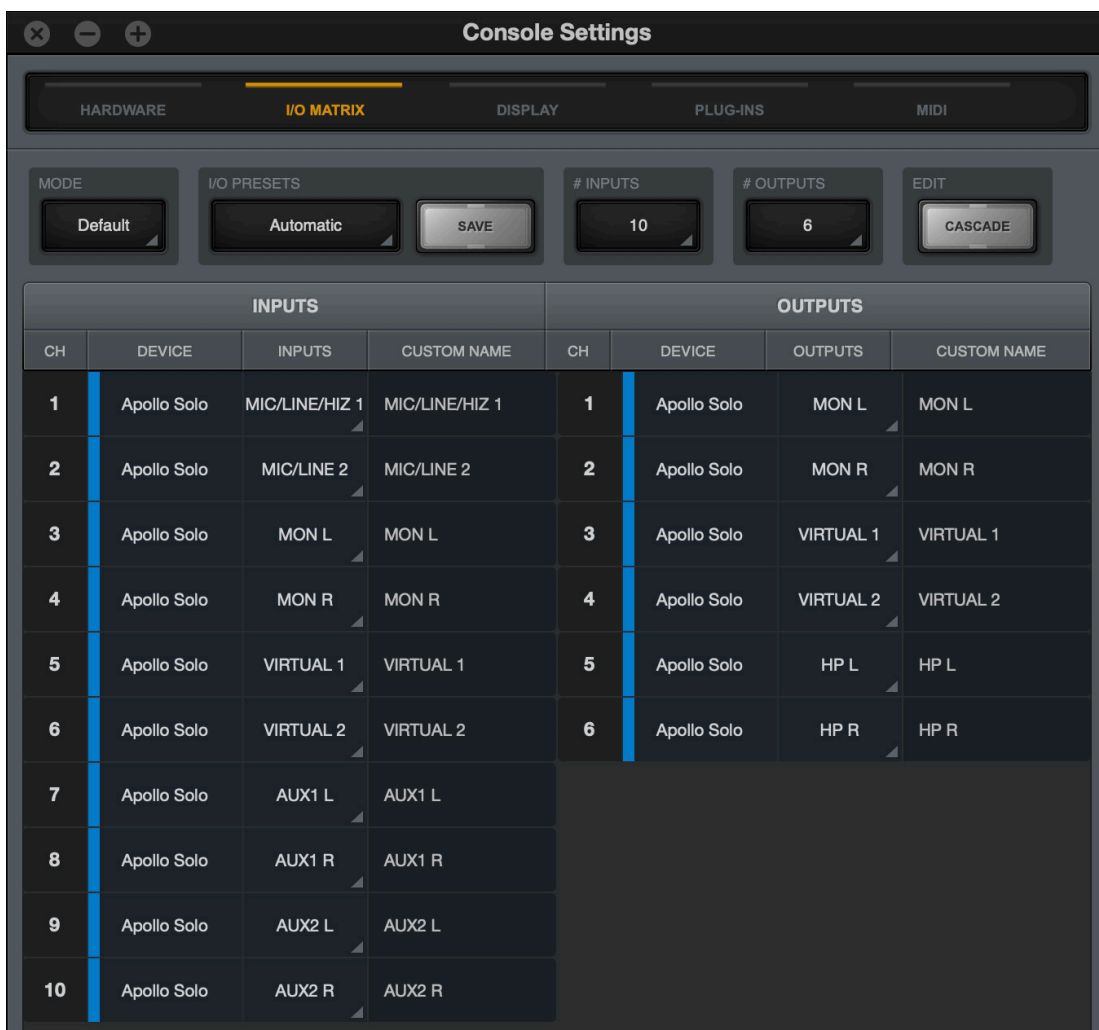
The I/O Matrix panel is where customized I/O routings for Core Audio (Mac) or ASIO (Windows) are managed at the driver level. For an overview of I/O Matrix features, see [I/O Matrix Overview](#).

## I/O Matrix Columns

In addition to the switches at the top of the panel, two columns are displayed. The INPUTS column on the left displays all available hardware and virtual Apollo Solo inputs. The OUTPUTS column on the right displays all available hardware and virtual Apollo Solo outputs.

## I/O Matrix Rows

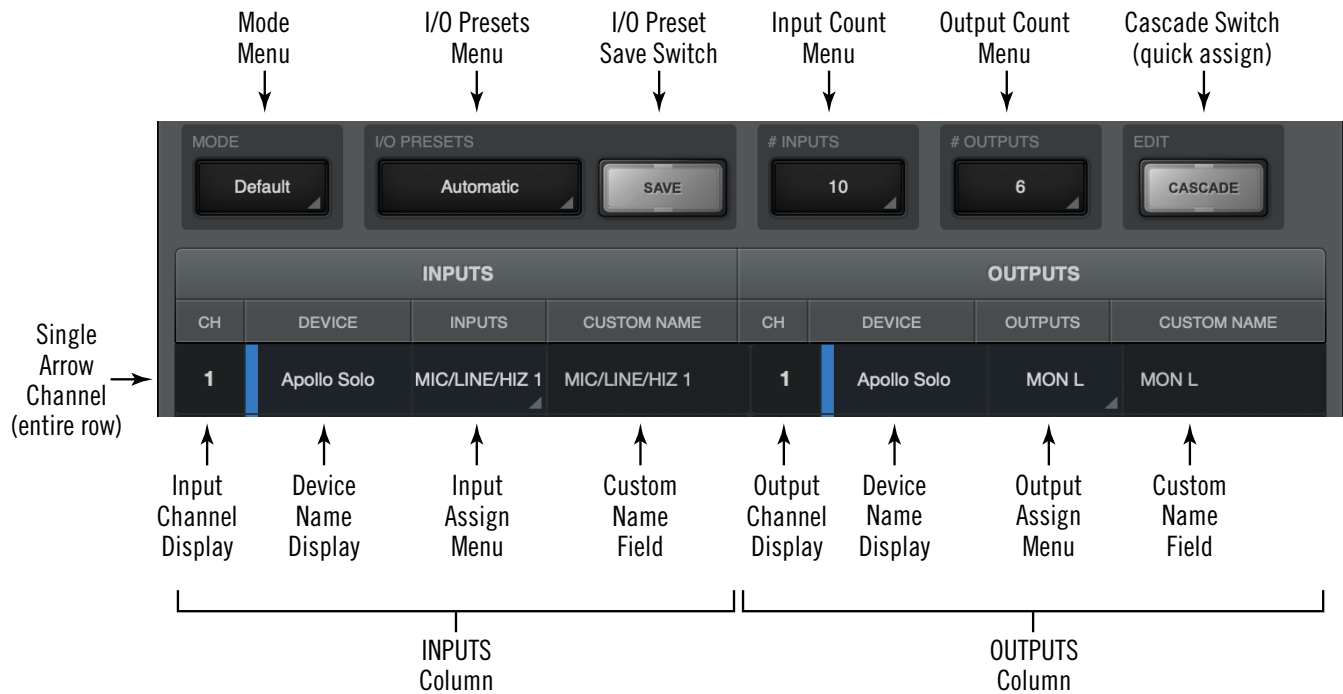
Each row in the panel represents a single Apollo Solo audio channel. The currently assigned input and output route for each channel is displayed within a single row. By clicking any assign switch, a different route can be mapped to the channel.



*I/O Matrix Panel*

# I/O Matrix Panel Elements

Refer to the diagram below for descriptions in this section.



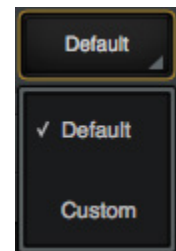
Main I/O Matrix panel elements

## Mode Menu

This menu provides a quick method to return to Apollo Solo’s default Core Audio/ ASIO driver settings. When any settings within the I/O Matrix panel are not the default value, this menu displays “Custom.”

To return to the factory default settings, choose “Default” from the MODE drop menu.

**Important:** Custom settings within the I/O Matrix panel are lost when MODE is changed to Default unless the custom settings are first saved via the I/O PRESETS controls.



Mode menu

If the mode is switched from Default to Custom, the I/O Preset Display shows “(Untitled)” indicating the current settings have not yet been saved.

## I/O Presets Overview

The I/O presets controls provide methods for managing complete I/O Matrix panel configurations as I/O preset files. When an I/O preset file is saved, the current I/O Matrix panel configuration is written to disk.

When an I/O preset file is subsequently reloaded, the I/O Matrix panel is returned to the exact same routing state, regardless of any changes to I/O Matrix settings that were made in the interim.

## I/O Preset Files Location

I/O preset files are saved to, and loaded from, the user's home folder at:

- Mac: Users/UserName/Documents/Universal Audio/IOPresets/
- Windows: C:\Users\UserName\Documents\Universal Audio\IOPresets\

**Note:** I/O preset files must reside in the default location to appear in the Route Presets popover within Console.

## I/O Preset Files Suffix

I/O preset files have the “.uadio” suffix. The suffix is added to I/O preset files automatically when saving to disk; however, the suffix is not displayed in the file save dialog (the suffix should not be manually typed when saving a I/O preset file).

**Note:** Without the .uadio suffix, I/O preset files will not be visible in the load preset window.

## Factory I/O Presets

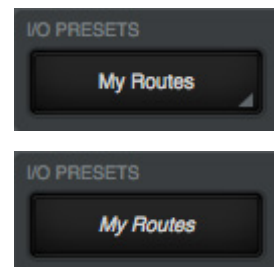
A variety of I/O presets are pre-installed with the software. The factory I/O presets are provided for backwards compatibility with Apollo sessions created with Console v1 and are not recommended for use with Apollo Solo.

## I/O Presets Menu

The currently loaded I/O preset name is displayed on top of the menu switch, as shown at right. If the I/O preset has not yet been saved, then “(Untitled)” appears in the display.

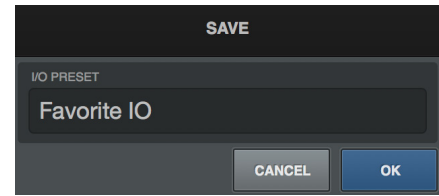
If a loaded I/O preset has been modified since it was saved, the I/O preset name is displayed in *italics*, as shown at right.

Clicking the I/O Presets display opens the [I/O Presets Popover](#), where various I/O preset functions can be performed.



## Save Switch

This switch saves the current state of the I/O Matrix panel to disk as an I/O preset file. If the I/O preset already exists, the existing I/O preset file is overwritten with the current settings. If the I/O preset has never been saved, the Save I/O preset dialog appears so the preset can be named.

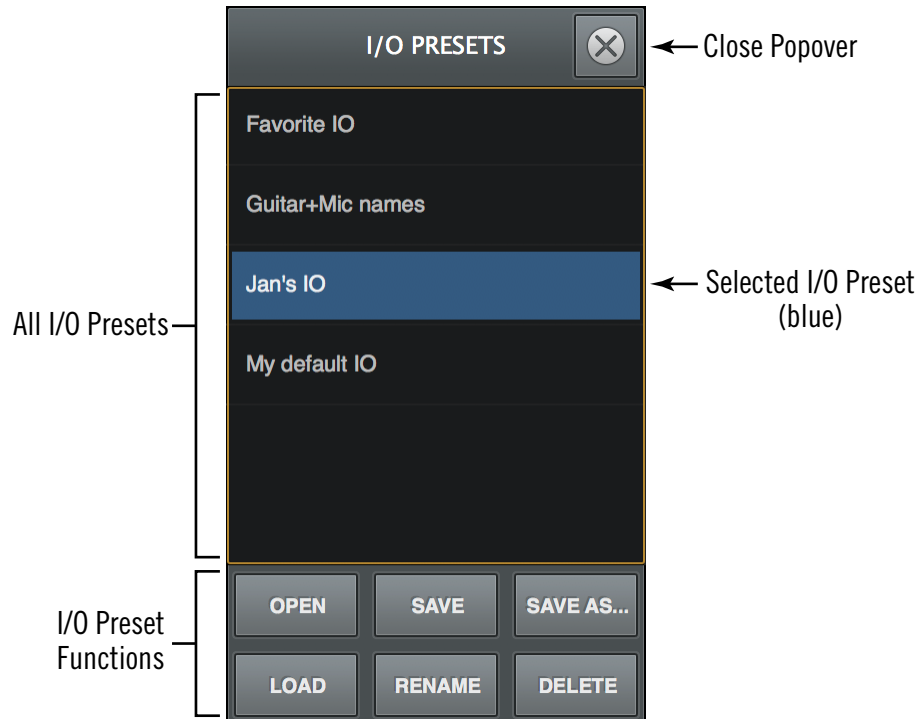


Save I/O preset dialog

**Important:** Settings will not be properly saved if the “/” (forward slash) or “?” (question mark) characters are in the filename. Avoid these and other special characters when saving I/O preset files.

## I/O Presets Popover

The I/O Presets popover window is where various functions can be performed on I/O preset files. To open the I/O Presets window, click the I/O Presets Menu.



I/O Presets popover

All existing I/O preset files at the [I/O Preset Files Location](#) are displayed in a list within the I/O Presets window. Available functions at the bottom of the window can be performed on the selected I/O preset (a preset is selected when it is highlighted in blue).

## I/O Presets Functions

The following I/O preset functions are available:

**Open** – Opens the operating system’s standard “Open File” dialog for loading existing I/O preset files from disk.

**Save** – Saves the current modified I/O preset file in place. If the preset was not previously saved (if the file doesn’t exist), the Save window appears so it can be named.

**Save As** – Opens the Save window so the current settings can be named and saved to disk as a new I/O preset file.

**Load** – Loads the I/O preset that is currently selected within the I/O Presets window (a preset is selected when highlighted in blue).

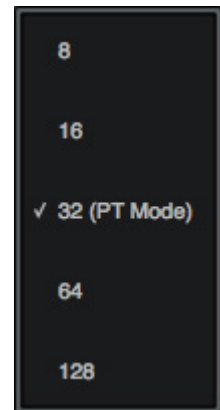
*Tip: An I/O preset can also be loaded by double-clicking the preset or typing Return (or Enter) when the preset is selected.*

## Channel Count Menus

**Note:** *The Channel Counts menus are generally not recommended for use with Apollo Solo. The menus are typically used with other Apollo models and/or multi-unit systems that have higher channel counts than Apollo Solo.*

The Channel Count menus (one each for number of inputs and number of outputs) are used to change the number of Apollo Solo I/O channels used by Core Audio / ASIO. By default, the total number of input and output channels for all devices are displayed.

The primary reason to change the channel counts is to accommodate the 32 I/O channels available within Pro Tools. When 32 channels are selected for Apollo I/O (PT Mode), any Apollo I/O can still be used by virtually remapping the I/O so the desired channels fit within the available channel count.



*Channel Count menus*

**Important:** *These menus change the driver I/O complement. Quit all DAW applications before changing the Channel Count settings.*

**# Inputs** – The number of active input channels used by Core Audio / ASIO is displayed. Click the display to select a different input channel count from the menu.

**# Outputs** – The number of active output channels used by Core Audio / ASIO is displayed. Click the display to select a different output channel count from the menu.

**Note:** *Each Core Audio / ASIO stream uses host computer CPU resources. To maximize CPU performance, do not set the channel counts higher than the number of channels actually needed.*



## Device Name Display

The [Device Name](#) of the interface is displayed in the INPUT and OUTPUT columns so each unit can be readily identified in multi-unit setups. Each device is color-coded for easier identification.

## Cascade Switch

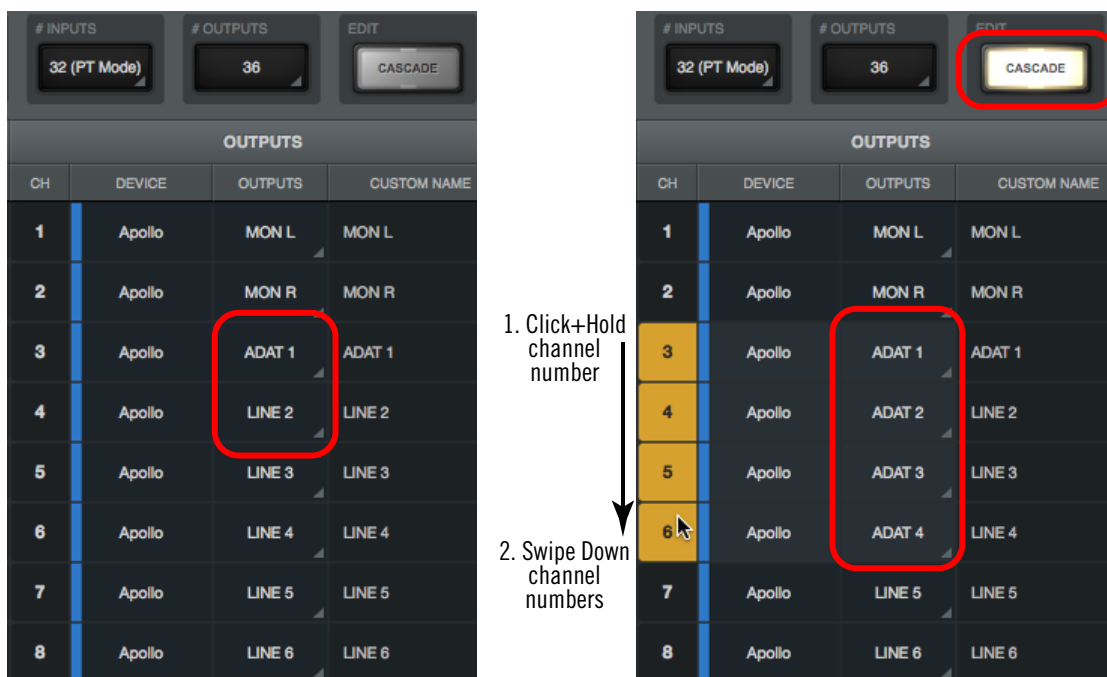
**Note:** The Cascade function is generally not of practical use with Apollo Solo. The function is typically used with other Apollo models and/or multi-unit systems that have higher I/O channel counts.

The Cascade switch is used to quickly assign continuous I/O channels if routings have been changed from default values.

**Note:** Cascade doesn't do anything when the [Mode Menu](#) displays "Default" because all channels are already continuous in default mode.

When Cascade is clicked, the Cascade switch and all channel numbers are illuminated. Click+hold any channel number, then swipe down adjacent channel numbers to quickly assign the channel(s) to the next available channel(s) in the device.

**Tip:** Increase the vertical size the Console Settings window to view more channels simultaneously, so more channels can be swiped.

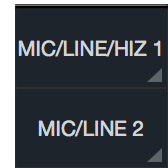


Using Cascade to quickly assign multiple channels. In this example, ADAT 1 has been previously assigned to LINE 1 (left screenshot). With Cascade engaged (right screenshot), swiping the ADAT output across the LINE outputs quickly reassigns the LINE outputs to ADAT outputs.

## Assign Switches

Each input and output channel has an assign switch. The assign switches are indicated by disclosure triangles at the lower right of each switch. The currently assigned route is displayed in the switch.

Default input and output routes can be remapped using the assign switches. Clicking an assign switch opens the [Route Assign Popover](#) for mapping a different route to the channel.



*Two assign switches*

## Custom Name Field

Each Core Audio / ASIO channel includes a name. This name is displayed wherever Core Audio / ASIO channel names are shown, such as I/O channel assignments within a DAW.

Apollo Solo's Core Audio / ASIO channel names can be customized by simply entering a different name in the CUSTOM NAME field. All custom name changes are instantly reflected in the application that displays channel names.

INPUTS	CUSTOM NAME
MIC/LINE/HIZ 1	Electric Guitar
MIC/LINE 2	Vocal Mic
MON L	Apollo Solo Out L
MON R	Apollo Solo Out R

*Example of customized driver names*

### To return to the default driver name:

1. Click a customized name in the CUSTOM NAME column. The custom name text is highlighted.
2. Press the Delete key to remove the customized text from the field.
3. Press Return/Enter.

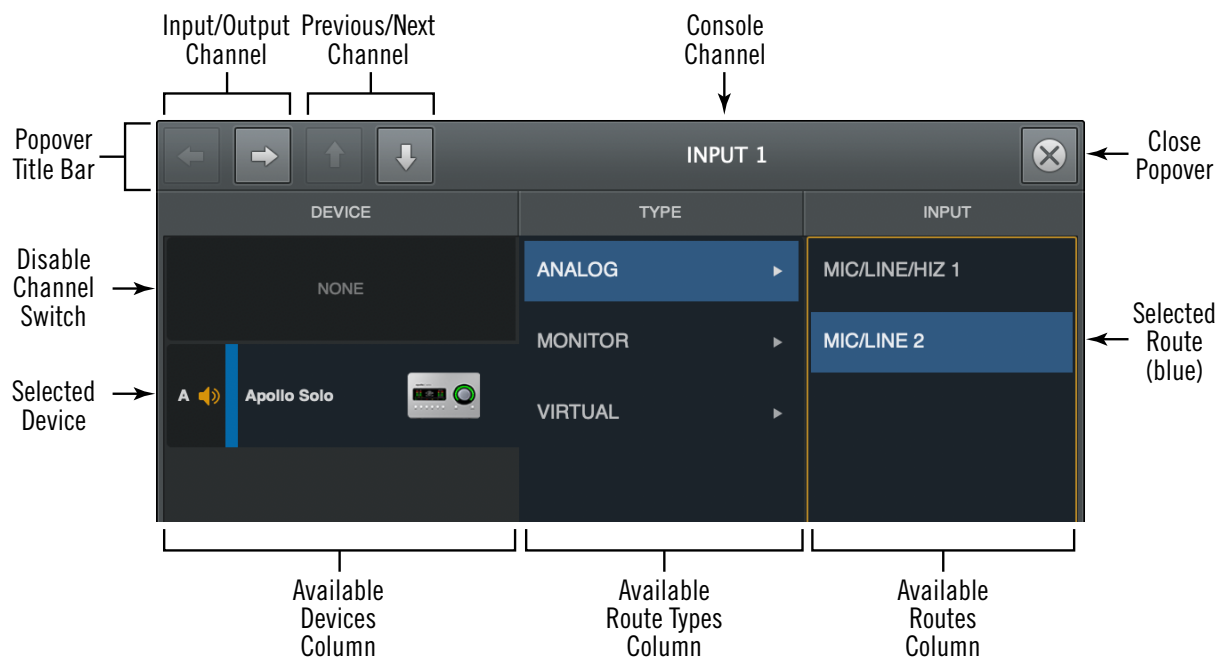
## Route Assign Popover

The Route Assign popover window is where Apollo Solo I/O routes can be virtually re-mapped at the driver level. For example, Apollo Solo's Hi-Z input channel 1 can be re-mapped so that it always appears as input channel 2 within the DAW.

To open the Route Assign window, click any assign switch.

**Important:** Custom driver I/O routing changes the driver I/O complement. Quit all audio applications before changing driver I/O assignments.

Refer to the diagram below for descriptions in this section.



*Route Assign popover*

## Popover Title Bar

### Navigation Switches

#### *Input/Output Channel*

Switches the window to display the input or output of the same Apollo Solo channel.

#### *Previous/Next Channel*

Switches the window to display the previous or next Apollo Solo channel.

*Tip: The popover moves from channel to channel with these switches. To prevent the popover from moving when these switches are used, drag the window to any location other than its default position.*

### Console Channel

The name of the channel that is being re-assigned is displayed at the top of the window.

### Route Assign Columns

The Device, Inputs, and Outputs columns are displayed in the Route Assign window.

#### Apollo Solo Device

The DEVICE column on the left displays all detected interfaces and the NONE switch. Click a device to select it for channel assignments in the other two columns. Click NONE to remove all I/O assignments from the channel.

#### Channel Type

The TYPE column in the middle displays all available channel types for the selected device. Click a channel type to select it and display all channels available for assignment in the INPUT/OUTPUT column.

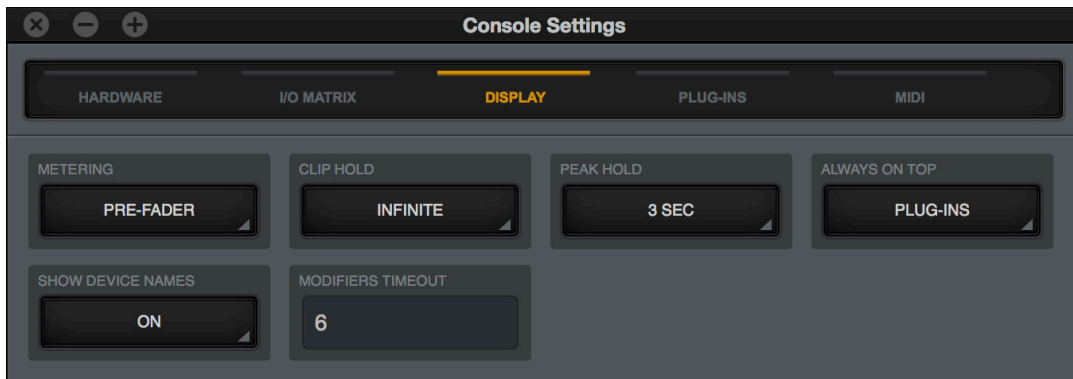
#### Available Routes

The column on the right displays all available routes for the selected channel type. Click an available route to assign the input or output. The assigned route is highlighted in blue.

*Note: If an output is gray in the output column and cannot be selected, the output is already in use by an input channel (custom I/O Matrix route) or HP cue output.*

# Display Panel

Various Console display options are set within the Display panel.



*Display panel*

## Metering

**Note:** The Metering Menu affects the Channel Meters of Console's channel inputs only. It does not affect the Aux Meters or the Monitor Meters, or the level of signals being routed to the DAW.

### Pre-Fader

When set to pre-fader, an input's Channel Meter indicates the level at the Apollo Solo input, regardless of the Channel Fader setting. With this setting, changing the fader level will not change the Channel Meter.

**Tip:** With this setting, the Channel Meters mirror signal levels being routed to the DAW. Pre-Fader metering allows you to monitor record levels from within Console.

### Post-Fader

When set to post-fader, changing an input's Channel Fader will change the Channel Meter.

**Important:** When post-fader metering, the Channel Meters do not display signal levels being routed to the DAW, and input/recording levels should be monitored in the DAW mixer to detect signal clipping (if any).

## Clip/Peak Hold

**Tip:** The Clip and Peak indicators can be cleared at any time with the [CLEAR CLIPS](#) button.

### Clip Hold Time

This drop menu sets how long the red signal clip indicators in the input, send, and monitor meters are displayed before turning off. The available values are None, 1 second, 3 seconds (default), 5 seconds, 10 seconds, or Infinite.

### Peak Hold Time

This drop menu sets how long the signal peak indicators in the input and send meters are displayed before turning off. The available values are None, 1 second, 3 seconds (default), 5 seconds, and 10 seconds.

## Always On Top

When set to NONE (the default value), UAD plug-in editor windows can be covered by the Console window when Console is the foreground application.

When set to PLUG-INS, UAD plug-in editor windows always float on top of the Console and Console Settings windows (when Console is the foreground application), so they are always visible.

**Note:** This setting only affects UAD plug-in window behavior within Console. It does not apply to UAD plug-ins when they are used within a DAW.

## Show Device Names

When set to ON, Apollo Solo's [Device Name](#) is displayed in the Meter Bridge.

This feature is intended primarily for use with multi-unit systems. When the Meter Bridge contains the inputs for more than one unit, this feature groups the input channels by device name for easier input identification.

**Tip:** This feature can also be accessed by right-clicking in the [Meter Bridge](#).



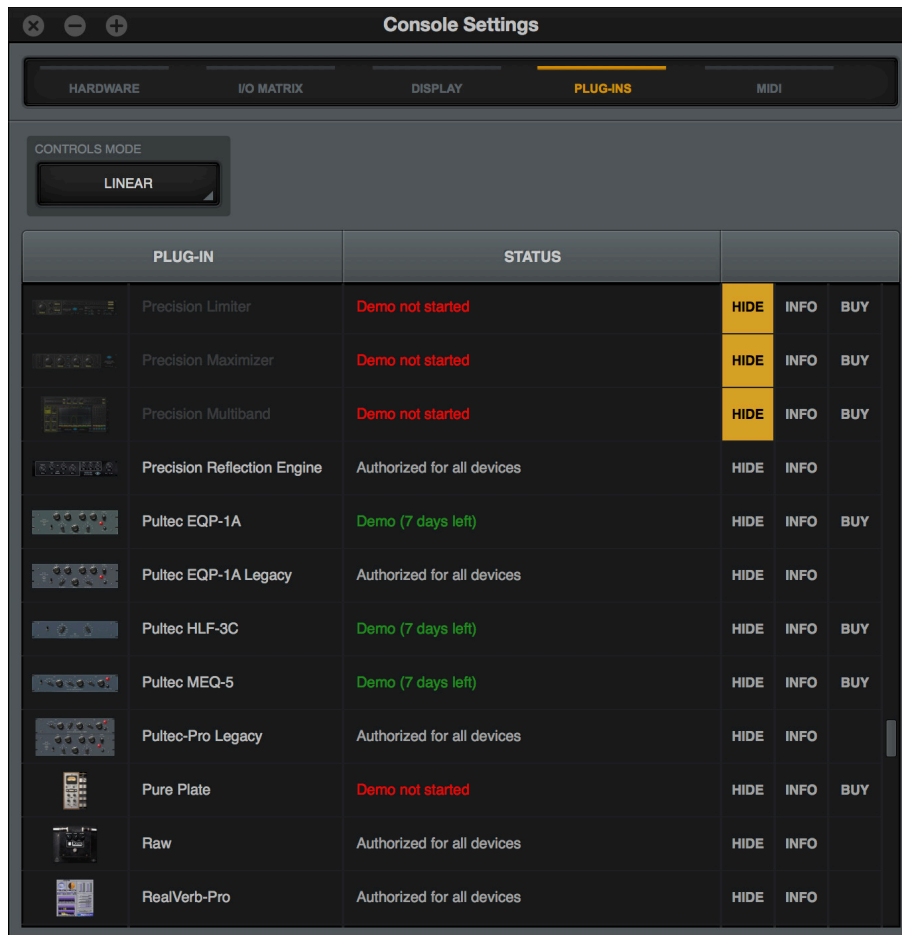
*Meter Bridge with Show Device Names OFF (left) and ON (right)*

## Modifiers Timeout

This option sets the duration, in seconds, used for [Option Latch](#) operations.

# Plug-Ins Panel

Various UAD plug-in options are set within the Display panel.



*Plug-Ins panel*

## Controls Mode

This setting determines how UAD plug-in parameter knobs respond to adjustment. Three control modes are offered: Circular, Relative Circular, and Linear. The behavior of each mode is described below.

*Tip: This setting is also available in the Configuration panel within the UAD Meter & Control Panel application.*

**Linear (slider)** – In Linear mode, the knob is adjusted by dragging horizontally or vertically instead of by rotating. This behavior is similar to moving a physical fader.

**Circular (jump)** – In Circular mode, the software knobs behave similar to physical rotary knobs. Values are changed by clicking on the knob then rotating in a circular direction. When the edge of the knob is clicked, the parameter value jumps to the mouse position.

**Relative Circular (grab)** – Relative Circular mode operates similar to Circular mode, but the knob value does not jump to the mouse position when clicked. Instead, the knob value is modified relative to its original value.

In Relative Circular mode, click anywhere on the knob to make an adjustment originating at the original value (it's not necessary to click on the current knob position).

*Tip: To increase adjustment resolution when adjusting rotary controls in circular and relative circular modes, increase the radius of the mouse relative to the knob while dragging (move the mouse farther away from the knob while dragging in a circular motion).*

## Plug-In Column

All installed UAD plug-ins are displayed in the list in alphabetical order. Settings for each UAD plug-in are contained within its row. Vertically scroll the list to see plug-ins that are not currently in view.

## Status Column

The authorization status and/or demo state of the plug-in is displayed here. The status mirrors the status shown in the Plug-Ins panel within the UAD Meter & Control Panel application.

*Tip: To start a 14-day plug-in demo, click START DEMO in the [Plug-Ins panel](#) within the UAD Meter & Control Panel application, or in the UAD Toolbar at the bottom of each UAD plug-in editor.*

## Hide Column

These switches prevent UAD plug-ins from being visible from within Console's Insert Assign popover. Click a plug-in's HIDE switch to toggle the state. The plug-in is hidden when HIDE is yellow and its title and icon are dim.

This function restricts the availability of assignable plug-ins. By default, all plug-ins are visible, even if they are unlicensed or the demo period is expired. By hiding plug-ins that are unlicensed or expired, only plug-ins that can process audio are exposed in the Insert Assign popover, which can be convenient for more rapid assignments.

## Info Column

These switches open the plug-in's product page at UA's online store, providing a general overview the plug-in.

*Tip: For detailed operational info for each plug-in, see the [UAD Plug-Ins Manual](#).*

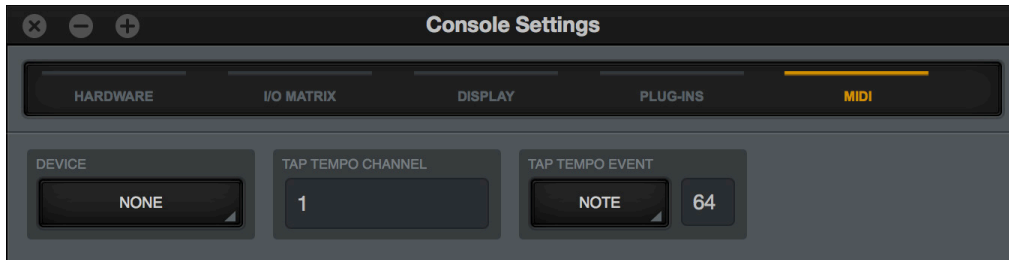
## Buy Column

Adds an unlicensed plug-in to the shopping cart at the UA online store. The switch is not visible for licensed plug-ins.



## MIDI Panel

Console supports the ability to use MIDI to remotely set the tempo used for the Tempo Sync feature. The MIDI panel is where the specific MIDI controls are set. MIDI data is received by Console via the operating system.



*MIDI panel*

### MIDI Device

Sets the MIDI device to be used as the source for MIDI control. To set the device, click the MIDI DEVICE menu and choose a new device from the drop menu.

***Note:** Only devices configured in the operating system are available for selection in this menu.*

### Tap Tempo Channel

Specifies the MIDI channel to be used for MIDI control. To set the channel, click the field and enter a numerical value between 1 – 16.

### Tap Tempo Event

Console can receive note or controller data for MIDI control of Tap Tempo. These two settings define the MIDI data type and value used for MIDI control. For instructions, see [Changing tempo via MIDI](#).

### MIDI Type Menu

Sets the MIDI data type to be used as the source for MIDI control. To set the data type, first click the drop menu then choose CONTROLLER or NOTE from the menu, or send the value from the MIDI controller.

### MIDI Value Field

Sets the MIDI data value to be used as the source for MIDI control. To set the data value, first click the field then enter a numerical value between 0 – 127, or send the value from the MIDI controller.

## MIDI Note Table

When NOTE is used as the MIDI type, the table below can be used as a reference for MIDI note values.

Note	Octave										
	-1	0	1	2	3	4	5	6	7	8	9
<b>C</b>	0	12	24	36	48	<b>60</b>	72	84	96	108	120
<b>C#</b>	1	13	25	37	49	<b>61</b>	73	85	97	109	121
<b>D</b>	2	14	26	38	50	<b>62</b>	74	86	98	110	122
<b>D#</b>	3	15	27	39	51	<b>63</b>	75	87	99	111	123
<b>E</b>	4	16	28	40	52	<b>64</b>	76	88	100	112	124
<b>F</b>	5	17	29	41	53	<b>65</b>	77	89	101	113	125
<b>F#</b>	6	18	30	42	54	<b>66</b>	78	90	102	114	126
<b>G</b>	7	19	31	43	55	<b>67</b>	79	91	103	115	127
<b>G#</b>	8	20	32	44	56	<b>68</b>	80	92	104	116	
<b>A</b>	9	21	33	45	57	<b>69</b>	81	93	105	117	
<b>A#</b>	10	22	34	46	58	<b>70</b>	82	94	106	118	
<b>B</b>	11	23	35	47	59	<b>71</b>	83	95	107	119	

*MIDI note numbers by note name and octave*

# Unison

## What is Unison?



Unison is an exclusive analog/digital integration system that's built into every Apollo Solo preamplifier. It's the first and only way to truly emulate classic analog mic preamp, guitar amp, and pedal behaviors in an audio interface.

Unison is an audio processing breakthrough that starts right at the source, the input stage, allowing Apollo Solo's preamps to sound and behave like the world's most sought-after tube and solid state preamps, guitar amps, and pedals — including their all-important impedance, gain stage “sweet spots,” and component-level circuit behaviors.

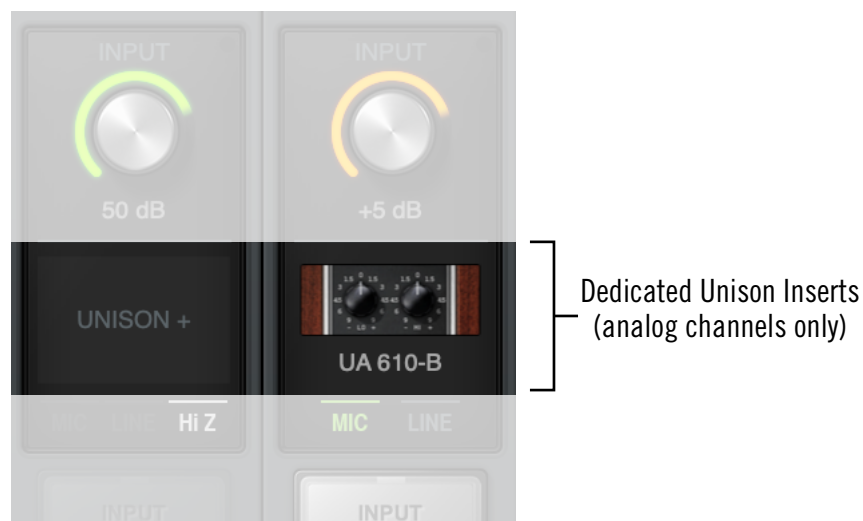
Apollo Solo's preamps are designed for high resolution, ultra-transparent translation from microphone to converter. This clean hardware design is the foundation for adding software color with UAD plug-in processing.

Unison-enabled UAD preamp, guitar amp, and pedal plug-ins reconfigure the physical input impedance, gain staging response, and other parameters of Apollo Solo's mic preamp hardware to match the emulated hardware's design characteristics.

Because the hardware and software are intricately unified, Unison provides continuous, realtime, bidirectional control and interplay between Apollo Solo's physical mic preamp controls and the software settings in the Unison plug-in interface.

Controls on Apollo Solo's top panel dynamically adjust the Unison plug-in's parameters to match the target preamp/guitar amp/pedal behavior. Correspondingly, changing a setting in the Unison plug-in interface will modify Apollo Solo's panel settings.

Because Unison can be active on more than one mic channel, a complement of premium emulated hardware is available concurrently.



*Unison is enabled by loading a UAD Unison plug-in into a dedicated Unison insert in Console*

## Unison Features

Unison technology enables these Apollo Solo features, all with Realtime UAD Processing:

- **Alternate microphone preamplifier sound** – Apollo Solo’s ultra-transparent mic preamps inherit all the unique sonic and input characteristics of the emulated hardware preamp, guitar amp, or pedal, including the mic, line, and Hi-Z inputs.
- **Realistic tandem control** – Unison facilitates seamless interactive control of Unison preamp plug-in settings using Apollo Solo’s digitally-controlled hardware and/or the plug-in interface. All equivalent preamp controls (gain, pad, polarity, etc) are mirrored and bidirectional. The preamp controls respond to adjustments with precisely the same interplay behavior as the emulated hardware, including gain levels and clipping points.
- **Hardware input impedance** – All Apollo Solo preamps feature variable input impedance in analog hardware that can be physically switched by Unison plug-ins for physical, microphone-to-preamp resistive interaction. This impedance switching enables Apollo Solo’s preamps to physically match the emulated unit’s input impedance, which can significantly impact the sound of a microphone. Because the electrical loading occurs on input, prior to A/D conversion, the realism is faithful to the original target hardware preamp.
- **Tactile gain staging** – Apollo Solo’s top panel preamp knob can independently adjust all gain and level parameters available within the Unison plug-in via [Gain Stage Mode](#). The gain stage being adjusted can be remotely switched via Apollo Solo, so multiple gain levels and their associated colorations can be tuned from the hardware knob for precise physical tactile control, all without using the Unison plug-in’s software interface.

## Unison Plug-Ins

**Note:** In all descriptive text, “Unison plug-in” is defined as any Unison-enabled UAD mic preamp plug-in, UAD guitar/bass amp plug-in, or UAD pedal plug-in.

Unison-enabled UAD plug-ins are uniquely coded for Unison integration. Only UAD plug-ins that are Unison-enabled can be loaded in Console’s [Unison Insert Location](#).

For a complete list of all Unison-enabled UAD plug-ins, see “Unison Plug-Ins List” in the appendix at the back of the [UAD Plug-Ins Manual](#).

## Activating Unison

Unison is activated by inserting any Unison-enabled plug-in into the dedicated Unison insert available on Console's preamp input channels. Click the UNISON insert to select a Unison-enabled plug-in from the Insert Assign popover.

**Tip:** *Unison can be active on more than one preamp channel at the same time.*

## Unison Insert Location

The Unison insert is located between the preamp gain knob and the standard channel inserts. The text "UNISON +" is overlaid on this insert.

**Note:** *To make the Unison insert visible, choose OVERVIEW or INPUT from the [View Column](#).*

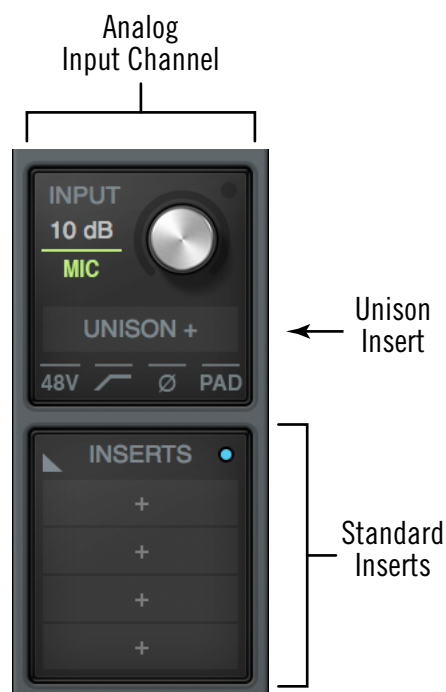
## Unison Processing

**Important:** *Unison processing in Console's Unison insert is always active on the channel's input signal, regardless of any subsequent channel routing options (HP cue, DAW I/O, etc). Therefore Unison processing is always recorded in the DAW, even if Console's Insert Effects switches are set to MON.*

## Unison Plug-Ins with Standard Inserts

UAD plug-ins that support Unison can also be used Console's standard inserts and/or within a DAW via VST/AU/RTAS/AAX 64 (as with any UAD plug-in). However, when Unison plug-ins are used in standard inserts, there is no physical or electrical hardware interaction. Unison plug-ins function the same as non-Unison UAD plug-ins in this configuration.

**Important:** *Unison features are available only when Unison-enabled UAD plug-ins are loaded within Console in the dedicated Unison inserts.*



Click "UNISON +"  
to insert a Unison plug-in

## Unique Behavior of Unison Inserts

Console's Unison inserts have some operational differences compared to standard inserts, as described below.

### Available UAD plug-ins

Only Unison plug-ins are available for selection from the [Insert Assign Popover](#) when inserting UAD plug-ins into the Unison insert. Non-Unison plug-ins are not visible in the Insert Assign popover with Unison inserts.

**Note:** All available Unison plug-ins are installed during the normal UAD Powered Plug-Ins software installation process (they are not separately installed).

### Linked insert enable and plug-in enable controls

Console's Unison insert enable/disable switch and the Unison plug-in's on/off switch in the plug-in interface are linked. Changing either on/off setting will also change the other setting.



### Disabled Unison plug-ins

When a Unison plug-in is unintentionally disabled (for example, when UAD-2 DSP resources are exceeded upon insertion), the red disabled indicator (see [Insert State Indicators](#)) does not appear as it does with non-Unison plug-ins. However, in this situation (unlike standard UAD plug-ins) the following indications do occur:

- The power switch within the Unison plug-in window is switched off
- The Unison insert's enable button is switched off
- Apollo Solo's top panel preamp gain level indicator color reverts to green

**Note:** The above functions can be re-enabled after adequate UAD resources are made available.

# Controlling Unison Plug-Ins with Apollo Solo

When a Unison plug-in is inserted in Console's Unison insert, Apollo Solo's top panel preamp controls and the Unison plug-in's equivalent preamp controls are mirrored. Adjusting Apollo Solo's top panel preamp controls adjusts the Unison plug-in's preamp controls, and vice versa.

## Plug-In Parameters

Unison plug-ins may contain parameters that are unavailable for hardware control via Apollo Solo. For example, the UA 610-B has EQ settings, but there are no EQ controls on Apollo Solo's hardware. To adjust these extra parameters, the Unison plug-in interface must be used.

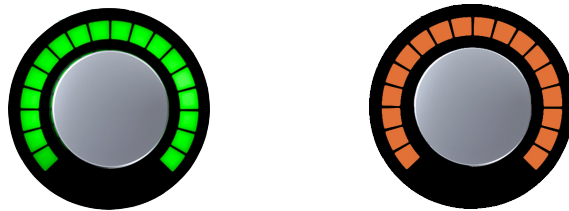
## Apollo Solo Top Panel Indication

### Unison Active

When a Unison plug-in is inserted in a Console Unison insert *and* Apollo Solo's top panel channel select function is set to the same channel, the color of Apollo Solo's top panel level indicator (the LED ring around the knob) is orange instead of green.

**Note:** *Apollo Solo's top panel must be in PREAMP mode and the channel selection indicator must match the Unison-enabled channel to see the top panel Unison indication.*

The orange-colored ring indicates that the currently selected preamp channel is using a Unison plug-in within Console, and that Apollo Solo's top panel knob is controlling the first gain stage of the preamp plug-in (with pedal plug-ins, the knob is controlling the primary effect parameter, e.g., distortion).



*Apollo Solo's top panel preamp knob during normal operation (left) and when a Unison plug-in is in the Unison insert of Apollo Solo's selected channel (right)*

### Additional Gain Stages

More than one gain parameter within the Unison plug-in can be adjusted using Apollo Solo's top panel knob by activating Gain Stage Mode. When Gain Stage Mode is active, the color of Apollo Solo's top panel level indicator, and the target parameter within the Unison plug-in's interface, changes depending on which parameter is currently being controlled by the knob, and the parameter being controlled can be navigated remotely by pushing the knob's switch. See [Gain Stage Mode](#) for details.

## Console Indications

### Gain Level

When Unison is active in the channel, the color of Console's preamp gain level display (the colored ring around the gain knob), and the channel selection dot on the gain knob, is orange instead of green.



If the Unison plug-in is inactive (either via the insert disable switch or the power switch in the plug-in interface), the color reverts to green.

**Note:** Console's preamp gain control only adjusts the first gain stage of any Unison preamp plug-in, even when Apollo Solo is in Gain Stage Mode.

### Gain Value Indicator

The preamp gain value display (the text value under the knob) always shows the current value of the main parameter within the Unison plug-in.



Additionally, the display is adapted to the parameter value and range of the first gain stage within the plug-in. For example, when the UA 610-A Tube Preamp plug-in is in the Unison insert, this field displays either "HI" or "LOW" because these are the only two values available in the first gain stage of this plug-in.

**Note:** This display shows "---" if the Apollo Solo hardware is not detected when a Unison plug-in is in the Unison insert and the insert is not disabled.



## Top Panel Channel Selection

### Level Knob Switch

In addition to the rotary control, Apollo Solo's top panel level knob has a switch function when the knob is pressed. The function of this switch varies depending on the active mode (either Channel Select Mode or Gain Stage Mode), as described below.

### Channel Select Mode (standard operation)

Channel selection determines which input channel can be adjusted with Apollo Solo's top panel preamp controls. This is the standard behavior when a channel is not in Unison mode (top panel channel selection is not related to Unison functionality).

Either of these methods can be used for channel selection with Apollo Solo hardware:

- **Preamp Switch** – After the PREAMP switch has been pressed at least once to switch the unit to Input mode, pressing the PREAMP switch alternates the currently selected input channel (CH1 or CH2).
- **Level Knob** – After the PREAMP switch has been pressed at least once to switch the unit to Input mode, pressing the LEVEL knob alternates the currently selected input channel (CH1 or CH2).

An Apollo Solo channel is selected for adjustment when its channel selection indicator LED (CH1 or CH2, above the input meters) is lit. If stereo linking is active, both indicators LEDs (CH1 and CH2) are lit.

### Gain Stage Select (Unison operation only)

When the currently selected Apollo Solo channel is in Gain Stage Mode, pushing the hardware level knob changes the Unison plug-in's gain parameter that is being controlled.

The color of Apollo Solo's top panel level indicator (the LED ring around the knob) changes to reflect the gain stage being controlled, and the gain stage is also indicated by the matching color of the indicator dot within the Unison plug-in's interface. For complete details, see [Gain Stage Mode](#).

## Gain Stage Mode

Unison plug-ins have either two or three gain parameters. By activating Gain Stage Mode, each of these gain stages can be independently adjusted using Apollo Solo's top panel gain knob.

**Note:** *Gain Stage Mode can only be active on one preamp channel at a time.*

Initially, when Unison is activated (before entering Gain Stage Mode), Apollo Solo's top panel gain knob controls the first gain parameter within the Unison plug-in. However, when Gain Stage Mode is active, pressing Apollo Solo's knob cycles through the available gain parameters in the plug-in.

### Activating Gain Stage Mode

**To enable Apollo Solo's Gain Stage Mode when using a Unison plug-in:**

1. In Console, confirm a Unison plug-in is inserted in the Unison insert of the Apollo Solo preamp channel to be controlled.
2. Using Apollo Solo's top panel hardware, select the input channel to be controlled using [Top Panel Channel Selection](#).
3. Press AND HOLD Apollo Solo's top panel knob for at least two seconds.

The state of Gain Stage Mode is indicated on Apollo Solo and in the Unison plug-in, as detailed below.

#### Gain Stage Mode – Apollo Solo Top Panel Indication

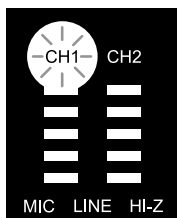
Apollo Solo's top panel channel selection indicator (CH1 or CH2) flashes when Gain Stage Mode is active for the currently selected input channel.

#### Gain Stage Mode – Unison Plug-In Indication

A colored outline appears within the Unison plug-in interface on the target parameter being controlled by the hardware knob.

See [Gain Stage Colors](#) for related information.

Apollo Solo Top Panel:  
Flashing Channel Selection



Unison Plug-In:  
Gain Parameter Outline



*Gain Stage Mode indications — Hardware (left) and Software (right)*

## Deactivating Gain Stage Mode

***Gain Stage Mode can be deactivated with any of these methods:***

- Press and hold Apollo Solo's top panel knob for at least two seconds (*Apollo Solo must be in Input mode by pressing the PREAMP button at least once*)
- Disable the Unison plug-in via the plug-in editor window within Console
- Disable the Unison plug-in via the on/off parameter within the plug-in interface
- Remove the Unison plug-in from Console's Unison insert
- Change the selected channel by pressing the PREAMP switch on Apollo Solo's top panel

***When Gain Stage Mode is deactivated, the following changes occur:***

- The gain stage select function (pushing the top panel hardware knob) reverts to the channel select function
- The channel selection indicator on Apollo Solo's top panel stops flashing
- If a gain stage other than the first gain stage was being controlled, Apollo Solo's knob reverts to control of the first gain stage of the Unison plug-in, and the level indicator color reverts to orange

## Controlling Individual Gain Stages

### Selecting Gain Parameters For Control

When the currently selected Unison plug-in channel is in Gain Stage Mode (when its [channel selection indicator is flashing](#)), push Apollo Solo's knob to cycle through the available gain parameters within the Unison plug-in.

***Note:*** Unlike Apollo Solo's top panel knob, Console's preamp gain control only adjusts the first gain stage of any Unison plug-in when Apollo Solo is in Gain Stage Mode. To adjust other gain stages from within Console, use Apollo Solo's hardware gain knob or the Unison plug-in's interface.

### Gain Stage Colors

The gain stage being controlled is indicated by unique [matching indicator colors](#) on Apollo Solo's top panel and within the Unison plug-in's interface.

The color of the level indicator on Apollo Solo's top panel (the LED ring around the knob) changes with each gain stage, and the matching color outline within the Unison plug-in's interface moves to the target gain parameter being controlled.

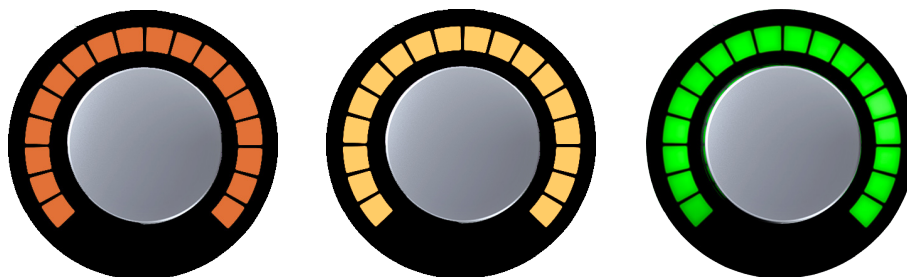
The gain stages available for control, and their associated colors, are:

- **Orange** – Gain stage one; the Gain parameter
- **Amber** – Gain stage two; the Level parameter
- **Green** – Gain stage three, the clean (non-modeled) output control

***Note:*** Some Unison plug-ins have only two gain stages.

### Matching Gain Stage Indicators

In Gain Stage Mode, Apollo Solo's level indicator (the colored ring around the top panel hardware knob) matches the colored dot on the target gain parameter in the Unison plug-in's interface, as shown below. The hardware and software controls are mirrored and the gain stage can be adjusted using either control.



*The color of Apollo Solo's level indicator changes to reflect the plug-in gain stage being controlled*



*The matching color dot on the parameter in the Unison plug-in interface indicates which gain stage is being controlled by Apollo Solo's top panel knob*

### Available Gain Stages

Unison plug-ins have up to three gain stage parameters. With Unison plug-ins that contain two gain parameters, only the available gain parameters are cycled and controlled in Gain Stage Mode.

**Note:** For details about the unique gain stage parameters available within individual Unison plug-in titles, refer to the *UAD Plug-Ins Manual*.

## Unison Load/Save Behaviors

**Caution:** Apollo Solo hardware preamp settings (including +48V phantom power and PAD) can change when Console/LUNA sessions are loaded. Details are explained in this section.

### Loading Unison Plug-In Settings

When Unison plug-in settings are loaded in Console/LUNA, the effect upon the currently active Unison plug-in settings varies depending on how the settings are loaded. Its important to understand the distinction, because critical preamp settings can be affected.

**Note:** When Unison plug-ins are used in [Console's standard inserts and/or within a DAW](#), this section does not apply. Settings load behavior outside of the Unison insert is like all other (non-Unison) UAD plug-ins.

There are two ways Unison (and non-Unison) plug-in settings can be loaded in Console/LUNA:

- **Plug-In Presets** – UAD Presets are loaded whenever a UAD plug-in is inserted (the default preset loads). Presets can be loaded from disk files via the [Presets Manager](#) or the UAD Toolbar. Preset files are used to save & load all settings of individual plug-in titles.
- **Console/LUNA Sessions** – Console sessions are loaded from disk via the [Sessions Manager Popover](#), the Console Recall plug-in in a DAW, or by double-clicking Console/LUNA session files on disk. Console sessions are complete Apollo configurations, containing all hardware and plug-in settings (i.e., Console sessions are Console presets).

### Loading Presets: Hardware settings are inherited

When a Unison plug-in is assigned to the Unison insert and a preset is loaded into the plug-in, the plug-in inherits the current equivalent hardware settings of the Apollo preamp, if those settings are available in the plug-in.

In simpler terms, Apollo's preamp settings always override a Unison plug-in's settings when a preset is loaded or the plug-in is inserted. This is done to prevent the plug-in's settings from switching the hardware to values that could cause extreme level changes and/or other unwanted circuit changes such as +48V phantom power.

For example, if the PAD is ON in the Apollo preamp, when the Unison preset is loaded, the pad setting in the plug-in is enabled to prevent unexpected level increases.

### Loading Sessions: Hardware settings are overridden

When a Console/LUNA session is loaded (via Console Recall menu, DAW sessions containing the Console Recall plug-in, or double-clicking Console/LUNA files on disk), **ALL Console settings are overridden (changed) by the saved session, INCLUDING ALL APOLLO HARDWARE INPUT SETTINGS.**

In simpler terms, Console/LUNA sessions always override Apollo's preamp settings, even if potentially harmful preamp settings are contained in the session file. This is done because the very concept of Console session recall is to reproduce all settings in the session.

For example, if the PAD is OFF in the Apollo preamp, when the Console/LUNA session is loaded, the pad setting in the plug-in is disabled and sensitive equipment could be affected, such as speakers (level increases) and/or ribbon mics (+48V phantom power).

## Unison Operation Notes

The operating notes in this section only apply to Unison functionality (when a Unison plug-in is loaded in Console/LUNA's dedicated Unison insert).

The notes do NOT apply to Unison plug-ins that are used in Console/LUNA's standard inserts, nor via VST/AU/RTAS/AAX64 within a DAW, even when a Unison plug-in title is used. In this scenario, Unison plug-ins function the same as all standard (non-Unison) UAD plug-in titles and there is no physical or electrical hardware interaction.

**Important:** *Unison functionality is available only when Unison-enabled UAD plug-ins are loaded within Console/LUNA in the unique Unison inserts.*

- When a Console/LUNA session is loaded (via Console Recall menu, DAW sessions containing the Console Recall plug-in, or double-clicking Console/LUNA files on disk), ALL Console settings are overridden (changed) by the saved session, including all Apollo hardware input settings such as +48V and PAD. See [Loading Sessions: Hardware settings are overridden](#) for additional details.
- Unison insert processing is always recorded in the DAW (regardless of the current [Channel Insert Effects](#) setting) because Unison plug-ins process the physical inputs.
- A microphone, line input, or Hi-Z instrument source must be attached to the Apollo input channel for Unison plug-in processing in the Unison insert to be audible.
- Apollo's hardware preamp controls remain active even if the Unison plug-in is disabled.
- Because Apollo's front panel preamp controls are always current and inherited by the Unison plug-in, changes made to a Unison plug-in when the plug-in is bypassed are not retained when the plug-in is reactivated.
- A Unison plug-in's modeled behaviors and parameter ranges are used by the hardware controls whenever possible, even if the attribute is different than Apollo's stock preamps. For example, if the Unison plug-in has a 15 dB pad, then Apollo's front panel PAD button value will use the Unison plug-in's 15 dB value instead of Apollo's stock 20 dB value.
- Default gain levels when a Unison plug-in is inserted can vary from Apollo's default (non-Unison) preamp levels, and also between various Unison plug-in titles. This is a by-product of accurate preamp modeling. Because hardware preamp designs from each manufacturer vary, they all have different total gain amounts, control ranges, and control response curves, whether Mic, Line, or Hi-Z.
- If a Unison plug-in does not contain settings that are available on Apollo (pad, low cut filter, etc), the Apollo settings are not changed when the Unison plug-in settings are loaded, and the Apollo settings are still available for control via Apollo's front panel and/or Console/LUNA channel.

*(Continued)*

- When a Unison plug-in is removed from the Unison insert, Apollo's mic input impedance reverts to its default value of 5.4K Ohms. When the original hardware preamp being emulated by the Unison plug-in has a Hi-Z (instrument) input and associated Hi-Z input switch, this switch is unavailable in the Unison plug-in interface. Instead, the Unison plug-in's Hi-Z input is automatically selected when a mono (tip-sleeve) plug is inserted into the Unison channel's front panel Hi-Z input jack.
- Hi-Z input impedance interaction is unavailable with first-generation (silver) Apollo rackmount models.
- When a channel strip preset is saved from a preamp channel, the channel strip preset contains the state of the preamp channel's Unison insert.
- When a preamp channel strip preset is loaded into a preamp channel, the Unison insert state is replaced by the Unison instance state in the preamp channel strip preset. For example, if the preamp channel strip preset's Unison insert is empty, the Unison insert will be empty after loading the preset.

# Console Recall Plug-In

Console Recall is a unique DAW plug-in supplied in VST, AAX 64, and Audio Units formats. It is inserted and used within host DAWs as with any other plug-in.

The primary function of the Console Recall plug-in is to store Console's current setup within the DAW project via the [SYNC](#) (synchronize) switch in the plug-in. The plug-in can also be used to view and adjust Apollo Solo's monitor output level, mono, and mute states without having to leave the DAW.

**Note:** *The Console Recall plug-in is not required to use the Apollo Solo interface hardware, the Console application, or a DAW.*

## SYNC

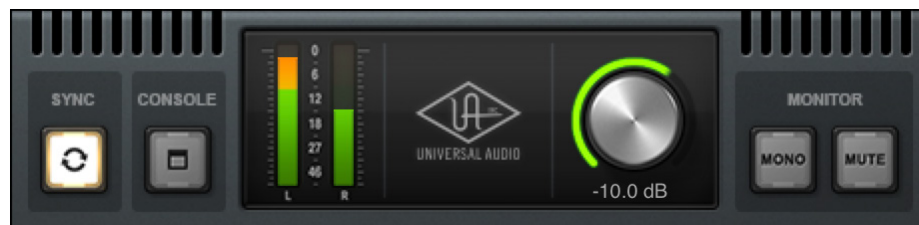
When a DAW project containing the Console Recall plug-in is saved and the SYNC switch is enabled in the plug-in, the currently active Console configuration is stored within the DAW project.

**Note:** *The SYNC switch is not present within the Console application.*

When the DAW project file is subsequently reloaded, Console is automatically restored to its configuration from when the DAW project was last saved, regardless of any changes to Console or Apollo Solo that were made in the interim.

Since plug-in settings are saved within DAW project files, using SYNC enables Console's current state to be stored within the DAW project file without saving or loading Console sessions presets via the [Cached Sessions](#) functions.

This feature ensures the DAW project will sound exactly the same when reloaded at a later date, even if Console contains customized settings that might affect the audio, such as send mixes, signal routings, and/or Realtime UAD Processing.



*Console Recall plug-in interface*



## Console Recall Controls

Most Console Recall plug-in controls are duplicates of those found in the Console application. The exceptions are the **SYNC** switch, and the **CONSOLE** switch, which opens the Console application.



*Console Recall plug-in controls*

## Monitor Controls

The exact same control descriptions in the Console application apply to the Console Recall plug-in controls. Refer to the Console Reference chapter for descriptions of the duplicated controls:

- [Monitor Meters](#)
- [Monitor Level](#)
- [Monitor Output Options](#)

## Console Switch

The Console application can be opened by clicking the **CONSOLE** switch within the plug-in. Note that the Console application does not need to be open when using the DAW with the Console Recall plug-in. Console settings are always captured by the Console Recall plug-in as long as the **SYNC** switch is engaged.

## How To Use Console Recall

To use Console Recall, simply place **one** instance of the Console Recall plug-in into any insert slot in the DAW project. The plug-in is installed to the same location as all other UAD plug-ins.

**Note:** The name of the plug-in is “Console Recall” (without the UAD prefix), so it's at the top of UAD plug-in lists within the DAW.

**Important:** To avoid unpredictable results, do not insert more than one occurrence of the Console Recall plug-in within any single DAW project.

Because the plug-in does not process audio in any way, the insert location isn't critical. Although it can be inserted in any location (audio track, virtual instrument track, aux bus, output, etc), inserting it in the master output is recommended for consistency because projects usually contain an output channel.

Upon instantiation, the plug-in's Monitor Level, Mono, and Mute controls mirror the equivalent controls in the Console application. Enabling **SYNC** causes the current Console settings to be stored within the DAW project.

### Enabling SYNC

When Console Recall is first loaded, the SYNC switch is disabled (gray). To activate SYNC, click the switch so it is enabled (lit).



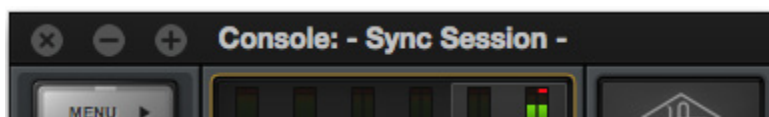
*SYNC switch when disabled (left) and enabled (right)*

Enabling SYNC does not change the Console settings. SYNC doesn't do anything until the DAW project file is saved and subsequently reloaded.

**Important:** SYNC saves Console's configuration within the DAW project, not the Console application. Therefore the DAW project file must be saved to disk to retain the Console settings in the project.

### Effect on Session Name in Console

When a DAW project is loaded that contains the Console Recall plug-in with SYNC enabled, “- Sync Session -” is displayed in Console's title bar.



*Console session name when SYNC is enabled in DAW*

## Loading Synchronized DAW Projects

If SYNC was enabled when a DAW project containing Console Recall was saved, then loading that DAW project sends the Console settings saved in the plug-in to Console. If the current Console settings are different than the Console settings in the DAW plug-in, the Console settings that were active before the DAW project was loaded are overwritten.

**Note:** *The Console settings that were active before the DAW project was loaded can be easily recovered if desired using the [Cached Sessions](#) feature in the [Sessions Menu](#) within the Console Application.*

If SYNC was disabled when a DAW project file containing Console Recall was saved, then loading that project will *not* change the Console settings that were active before the DAW project was loaded.

## Session State Parameter

The Console Recall plug-in has a parameter called “Session State” that is exposed for DAW automation but is not in the plug-in interface. Session State ensures all changes to Console settings and the DAW session are captured by the Console Recall plug-in. If something related to Session State appears in the DAW, it’s best to just ignore it.

**Important:** *To ensure proper functionality when SYNC is enabled in Console Recall, do not create or edit DAW automations with the Session State parameter.*

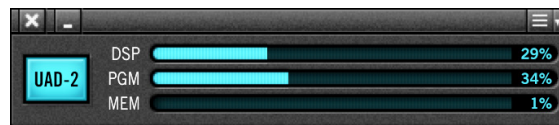


# UAD Meter & Control Panel

The UAD Meter & Control Panel application is used to monitor and configure UAD device resources. It is also used to manually authorize UAD plug-ins after a purchase as the UA store. The application has two main windows: the UAD Meter, and the UAD Control Panel.

The UAD Meter displays the current DSP, program, and memory status of UAD devices in realtime. The UAD Control Panel has multiple panels that display and modify various system, plug-in, and global configuration parameters.

**Note:** This application is for all UAD device models (Arrow/Apollo audio interfaces and UAD-2 DSP Accelerators).



UAD Meter Window

The UAD Meter & Control Panel application can be launched or quit at any time. It does not need to be open or active to use Apollo Solo or UAD plug-ins. It is completely independent and does not require Console or a DAW. You can move the UAD Meter to a convenient location on your screen by dragging its window title bar.

**Note:** If “No Devices Found” appears in the UAD Meter window instead of the expected buttons and gauges, the UAD software is not communicating with the UAD hardware. If this occurs, double-check hardware and software installations and/or contact [Technical Support](#).

## Launching the Application

The UAD Meter & Control Panel application can be opened using the techniques listed for each operating system below.

### Windows

- Access the application from:  
Start Menu>All Programs>UAD Powered Plug-Ins

### Mac

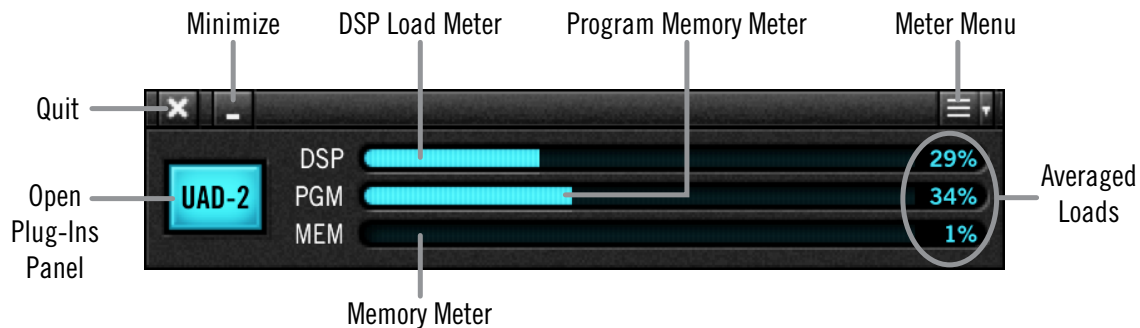
- Single-click the UAD Meter & Control Panel icon that was placed in the macOS Dock during installation
- Double-click the UAD Meter & Control Panel application that was installed at:  
/Applications/Universal Audio/



UAD Meter &  
Control Panel  
application icon

# UAD Meter Window

Refer to the illustration below for descriptions in this section



UAD Meter window elements

## Title Bar

The Title Bar (the strip across the top of the UAD Meter window) contains buttons to quit the UAD Meter & Control panel application, minimize the UAD Meter window, and access the Meter Menu.

**Note:** The Quit, Minimize, and Menu button positions shown above are as they appear on Mac systems. These button positions are reversed on Windows systems, reflecting the OS conventions.

## Plug-Ins Panel Button

Clicking this blue button opens the Plug-Ins panel. It has the same function as selecting “Plug-Ins...” from the Meter Menu.

## UAD Resource Display

UAD plug-in loads are shown in the UAD Meter window. These three gauges (DSP, PGM, and MEM) provide visual feedback, helping to determine which UAD plug-ins to use if available UAD resources are limited.

The UAD resources are displayed as blue bar graphs and as percentages. These gauges have no controls; they are visual indicators only.

**Tip:** The UAD Resource Gauges are also displayed in the Info Bar within Console.

## Averaged Loads

The load for each gauge represents the average for all UAD devices in use. For example, if a UAD-2 Satellite Thunderbolt OCTO is connected, the UAD DSP load is an average of the eight DSP processors in the unit plus the single DSP within Apollo Solo. If additional UAD-2 accelerators are added, the average load is automatically adjusted.

## Individual Loads

When additional UAD devices are added to the system, individual DSP loads within the individual units can be viewed in the System Information panel.

## UAD Plug-In Loads

The amount of UAD resources used by UAD plug-ins vary with each individual plug-in; more complex algorithms require more resources.

## UAD Instance Chart

The amount of DSP used by each individual UAD plug-in is available in the UAD instance count chart. The chart can help determine which to plug-ins to use with available resources. The chart is published online at [help.uaudio.com](http://help.uaudio.com).

## Static Loads

Apollo Solo uses UAD DSP and memory for its internal digital mixer and Input Delay Compensation engine. Therefore, the meters will indicate loads when Apollo Solo is connected, even if UAD plug-ins are not inserted in Console or the DAW.

***Note:** Console's Input Delay Compensation can be disabled in Console Settings to slightly reduce UAD loads when IDC is not needed.*

## DSP

The DSP gauge indicates the amount of digital signal processing resources that are being used by all UAD devices in the system.

DSP is the primary hardware resource that powers the UAD plug-In algorithms. When UAD plug-ins are disabled, DSP requirements are decreased.

***Note:** When UAD plug-ins are disabled, DSP requirements are decreased EXCEPT when the plug-in is disabled using the soft bypass control within the plug-in interface. This control may be named bypass or power, depending on the plug-in.*

## Program

The Program (PGM) gauge indicates how much UAD program memory is in use. Program memory is an on-chip memory that is specific to the UAD-2 DSP processor and is used for certain UAD plug-in resources.

Each unique UAD plug-in uses a bit of program memory. If many different UAD plug-ins are loaded simultaneously, it is possible for this resource to run out before a DSP overload occurs. This threshold is considered and factored in by the automatic UAD load balancing routines.

## Memory

The Memory (MEM) gauge indicates the percentage of UAD RAM that is currently in use. It indicates the total available UAD memory available, regardless of the number of DSP processors that are installed.

Memory is used for echo, delay lines, reverb, and other spatial processing. When UAD plug-ins are disabled but not unloaded, memory requirements are not decreased. In this case, the memory remains loaded so that reverb tails and delay lines are not cut off when the plug-in is disabled.

## Meter Menu

The Meter Menu can be used to access the UAD Control Panels and Always On Top mode. To view the Meter Menu, click the menu button in the UAD Meter window title bar as shown below. After clicking the menu button, select an available function from the drop menu.

*Tip: The Meter Menu functions can also be accessed by using the keyboard shortcuts listed in the menu.*



*Accessing the Meter Menu*

## Control Panels

The [UAD Control Panels](#) (System Info, Plug-Ins, Configuration, Help) can be accessed by selecting them from the Meter Menu.

## Always On Top

The UAD Meter & Control Panel application windows can be set to either normal or Always on top view modes.

In normal mode, the UAD Meter and UAD Control Panel windows are covered by the windows of the foreground application. Normal mode is active when the Always On Top menu item is unchecked

In Always On Top mode, the UAD Meter and UAD Control Panel windows always float on top of other windows, even when other applications are in the foreground. Always On Top is active when a check mark appears next to the item in the Meter Menu.

## UAD Control Panels

The UAD Control Panels are where detailed system information is displayed and global UAD plug-in settings are modified. The main UAD Control panel window has four panels, organized by related functions: System Information, Plug-Ins, Configuration, and Help.

### Accessing the Control Panels

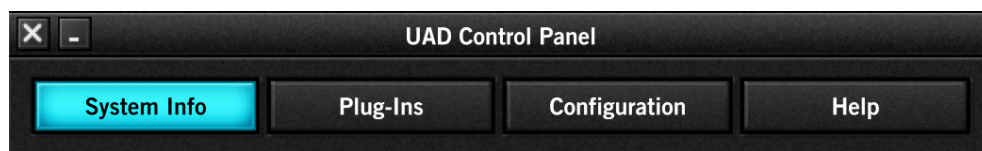
The UAD Control Panel window is accessed from the UAD Meter window. To open the Control Panel, click the menu button in the UAD Meter window title bar as shown below. After clicking the menu button, the available functions are listed in the drop menu.

**Tip:** The UAD Control Panels can also be accessed by using the keyboard shortcuts listed in the Meter Menu.



*Control Panels drop menu*

When the main UAD Control Panel window is open, the individual window panels are accessed by clicking the panel name buttons at the top of the Control Panels window or typing the keyboard shortcuts shown in the Control Panel drop menu.

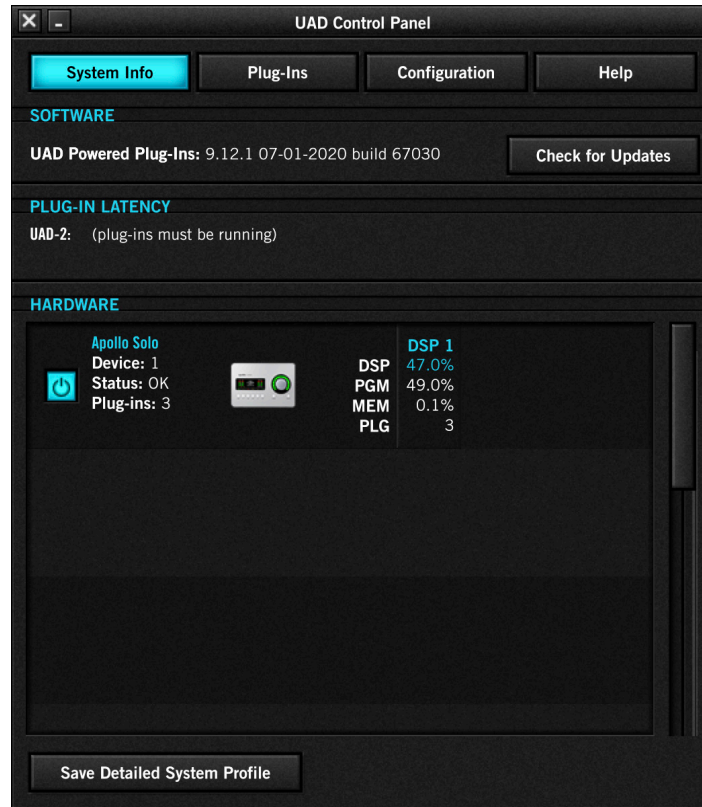


*Control Panel buttons with System Info panel selected*



# System Information Panel

The System Information panel displays detailed UAD software and hardware information and contains several useful buttons. Refer to the screenshot below for descriptions in this section.



## Software Section

### Version String

The currently installed version of UAD software is displayed here.

### Check for Updates

This button checks the Universal Audio web servers for a newer version of the UAD software. Running the latest version of UAD Powered Plug-Ins is recommended for maximum stability and new platform features, such as the latest UAD plug-ins.

## Plug-In Latency

UAD plug-in latency in the DAW, in samples and milliseconds, is displayed here when the DAW is running.

**Note:** *These plug-in latency values are unrelated to UAD plug-ins used within Console.*

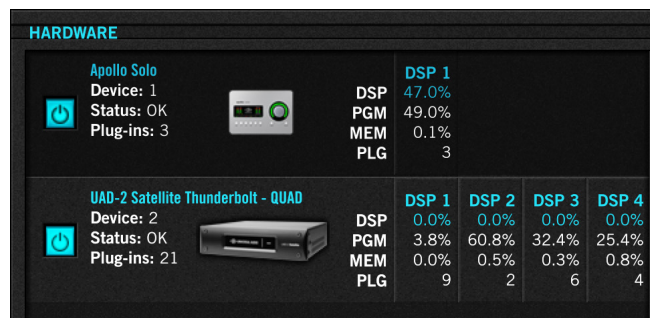
The displayed values are calculated from the current audio I/O buffer size and the session sample rate when [Extra Buffering](#) is off. When Extra Buffering is on, the displayed latency is the I/O buffer size plus 64 samples.



The displayed latency value does not reflect the lowered latency when [LiveTrack Mode](#) is active in UAD plug-ins within a DAW.

**Note:** *The displayed sample latency number does not include the extra samples produced by UAD plug-ins with additional latency. For more detailed information about the extra samples and latency, see [Latency & Apollo Solo](#).*

## Hardware Section

Detailed information about each active UAD device and its DSP is displayed in the Hardware area. If several devices are installed, use the scroll bar to see the other devices if they are out of view.



HARDWARE																										
<b>Apollo Solo</b> Device: 1 Status: OK Plug-ins: 3	 <table><tr><td>DSP</td><td>47.0%</td></tr><tr><td>PGM</td><td>49.0%</td></tr><tr><td>MEM</td><td>0.1%</td></tr><tr><td>PLG</td><td>3</td></tr></table>	DSP	47.0%	PGM	49.0%	MEM	0.1%	PLG	3																	
DSP	47.0%																									
PGM	49.0%																									
MEM	0.1%																									
PLG	3																									
<b>UAD-2 Satellite Thunderbolt - QUAD</b> Device: 2 Status: OK Plug-ins: 21	 <table><thead><tr><th>DSP</th><th>DSP 1</th><th>DSP 2</th><th>DSP 3</th><th>DSP 4</th></tr></thead><tbody><tr><td>DSP</td><td>0.0%</td><td>0.0%</td><td>0.0%</td><td>0.0%</td></tr><tr><td>PGM</td><td>3.8%</td><td>60.8%</td><td>32.4%</td><td>25.4%</td></tr><tr><td>MEM</td><td>0.0%</td><td>0.5%</td><td>0.3%</td><td>0.8%</td></tr><tr><td>PLG</td><td>9</td><td>2</td><td>6</td><td>4</td></tr></tbody></table>	DSP	DSP 1	DSP 2	DSP 3	DSP 4	DSP	0.0%	0.0%	0.0%	0.0%	PGM	3.8%	60.8%	32.4%	25.4%	MEM	0.0%	0.5%	0.3%	0.8%	PLG	9	2	6	4
DSP	DSP 1	DSP 2	DSP 3	DSP 4																						
DSP	0.0%	0.0%	0.0%	0.0%																						
PGM	3.8%	60.8%	32.4%	25.4%																						
MEM	0.0%	0.5%	0.3%	0.8%																						
PLG	9	2	6	4																						

*Hardware section as it appears with multiple UAD devices*

## Device Status

For each installed device, its status and a small hardware icon are displayed. When the device displays “Status: OK” the hardware is operating properly. The total number of UAD plug-ins loaded on each device is also displayed here.

## Device Enabled

Individual UAD devices can be disabled using the Device Enabled button. This can be useful, for example, if creating a session on a system with multiple devices that will be transferred to a system with fewer devices, or to streamline performance of the host system when multiple devices are not needed.



Click the button to disable an individual device. The device is enabled when the button is blue. For additional information regarding multi-device use, see [Expanded UAD Systems](#).

Devices remain disabled only while the UAD Meter & Control Panel application is open. When the UAD Meter & Control Panel is quit, disabled devices are re-enabled.

**Note:** *Disabling devices does not disable plug-ins already running on the device; it only prevents additional plug-ins from being loaded onto the device.*

**Important:** *For optimum results, quit any host applications using UAD plug-ins before disabling/enabling devices.*

## DSP Load

If more than one UAD DSP is installed, information for each DSP is displayed. DSP, Program (PGM), and Memory (MEM) loads are displayed as a percentage of total available load for that processor. The number of UAD plug-ins (PLG) running on each individual processor is also displayed.

## Save Detailed System Profile

Clicking this button will generate a detailed UAD system profile and prompt you for a location to save the text file to disk. This file contains an even greater level of detail than the System Information panel, which can be useful for troubleshooting or if UA Customer Support requests this document when providing assistance.

The profile lists the version strings of the individual UAD software components, installed device type(s) with serial and hardware ID numbers, host computer information, and detailed authorization status for all UAD plug-ins.

# Plug-Ins Panel

The Plug-Ins panel displays the current authorization and demo status of all installed UAD plug-ins. Use the scroll bar to view plug-ins that are not visible in the list. Refer to the screenshot below for descriptions in this section.

*Tip: The Plug-Ins panel can be accessed by clicking the blue [Plug-Ins Panel Button](#) labeled “UAD-2” in the UAD Meter window.*



## Authorize Plug-ins button

UAD plug-ins are automatically authorized each time the computer is started (internet connection required). This button links to your account at the UA online store to manually authorize licensed UAD plug-ins.

*Note: Click this button whenever you buy a plug-in at the UA store to manually authorize your new plug-in purchase.*

The complete procedure for manual UAD device authorization is detailed in the [UAD Authorization Procedure](#). If the UAD computer is not connected to the internet, see [Offline UAD Authorization](#).

*Important: UAD plug-ins require authorization before they can be used.*

## Plug-In Column

All currently installed UAD plug-ins are displayed in the Plug-In column. Plug-Ins are listed by release order, with newest plug-ins at the top of the column.

## Status Column

The Status column reflects the current authorization state of each UAD plug-in. After authorization, the status will show one of the following:

**Authorized for all devices** – When the plug-in is licensed and authorized to run on all devices in the system, “Authorized for all devices” is displayed in white text.

When a plug-in is licensed but not all devices in a multi-device system are authorized with the license (when the devices are not in the same UA account system), the Status column indicates which of the devices is authorized (for example, “Authorized for device 1 only”).

**Start Demo** – When this button is visible, the demo period has not been started for the plug-in. Click the START DEMO button to begin the 14-day trial period.

UAD plug-in demos can also be initiated by the START DEMO button in the UAD Toolbar at the bottom of the plug-in window. See [Demo Mode](#) for detailed information.

**Important:** *The 14-day demo period can only be activated once, and cannot be stopped or restarted during this period. Don't activate demo mode unless you have adequate time to thoroughly evaluate its sound and functionality.*

**Demo Active (days remaining)** – If the 14-day demo has been activated but is not yet expired, the number of days remaining in the trial period is displayed here in green text.

**Demo Expired** – If the 14-day trial period has ended, DEMO EXPIRED is displayed here in red text.

## Help Column

Clicking the Help button (?) opens a link to the plug-in product page at the UA online store.



## Buy Column

Clicking the Buy button (\$) adds the plug-in to your shopping cart at the UA online store. See [Buying UAD Plug-Ins](#) for details. This button does not appear if the plug-in is already licensed.

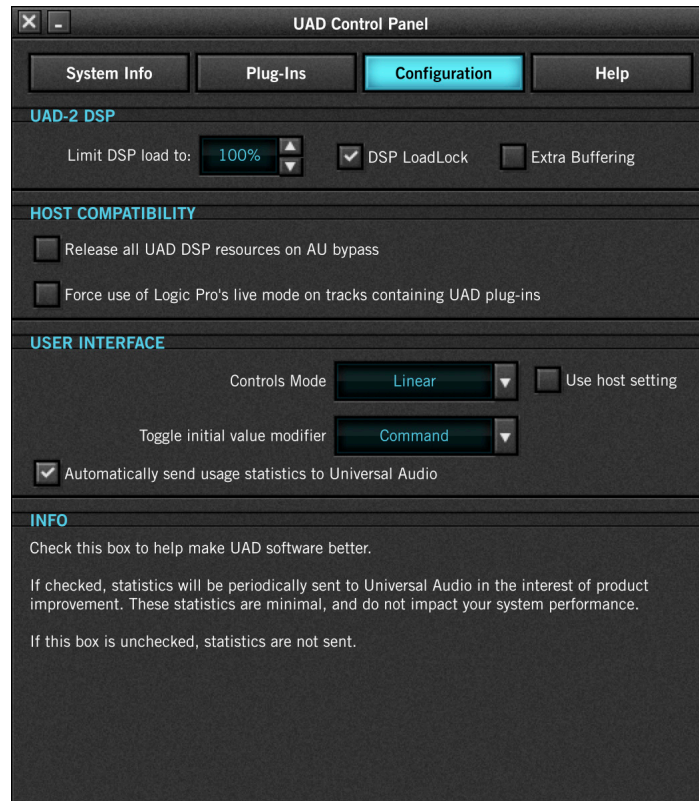


**Tip:** *The BUY button provides a quick visual reference to determine which UAD plug-ins are unlicensed.*

# Configuration Panel

The UAD Configuration Panel is where most of the global UAD settings and preferences are specified for UAD devices. Refer to the screenshot below for descriptions in this section.

**Note:** Settings related specifically to Apollo Solo's audio interface functionality and Console are set in [Console Settings](#).



The settings displayed in the Configuration Panel depend on the UAD hardware that is currently installed and the OS platform (Windows or Mac). For example, if Apollo Solo is installed in a Windows system, you will not see Mac-specific settings.

**Note:** UAD settings apply to all UAD-2 DSP Accelerators and UA audio interfaces unless specifically noted otherwise.

## UAD-2 DSP Settings

### Overview

Without UAD plug-ins, overloading the host computer system with native (host CPU based) plug-ins can cause audio dropouts and other system issues. Some DAWs, for example, provide a switch that allows you to trade latency for stability when the system is overloaded. Similarly, the UAD DSP load cannot exceed 100% without unpredictable behavior.

With the Limit DSP Load feature, the UAD DSP can also be limited so the load cannot exceed 100%, thereby increasing overall system stability in high load situations. With very heavy UAD loads, DSP load limiting may also improve host CPU performance.

There are many variables that affect DSP load (sample rate, I/O buffer size, parameter values, mono/stereo, automation, host system performance, etc). Although these variables are taken into account, the resulting measurement cannot be absolutely accurate due to variations in system configurations, including computer bus loading, which is impossible to measure.

Systems that are heavily loaded due to the presence of other devices or suboptimal configurations may cause additional DSP loading that cannot be measured by the UAD plug-in load calculator. The DSP load limit should be reduced in this case.

It is possible for certain (atypical) conditions to be met where another UAD plug-in can't be added, even when the UAD Meter says you should have DSP available when compared to the DSP Load Limit value.

**Note:** When *Limit DSP Load* is enabled and the DSP load limit is exceeded when instantiating a new UAD plug-in, an overload message will appear and **DISABLED** will be displayed in the plug-in's UAD Toolbar. In this case, even though the UAD plug-in loads, it will not process audio.

### Limit DSP Load

This setting determines the maximum UAD DSP load. If performance issues such as overloads, dropouts, stuttering, and/or other artifacts persist, change the UAD DSP load value by clicking the triangles to the right of the percentage display or entering a value directly with text entry.

**Note:** UAD-2 DSP load limiting is always on. 100% (the default value) is the maximum available setting.

## DSP LoadLock

DSP LoadLock reserves the maximum UAD-2 DSP load required by each plug-in, even if certain plug-in features are disabled. This ensures there will always be enough DSP if those features are later enabled, or when automating parameters that affect the DSP load.

Disabling LoadLock increases available UAD-2 DSP by disabling unused features in certain plug-ins, but may cause problems with previously saved sessions that had all plug-in features enabled, or when automating parameters that affect the DSP load.

The specific UAD plug-ins that have the ability to reduce DSP use when certain features are disabled are listed in the UAD Instance Chart at [help.uaudio.com](http://help.uaudio.com). These plug-ins are marked with an asterisk (\*) in the chart.

Enabling DSP LoadLock is recommended for optimum performance. Disable LoadLock only when you need to squeeze in that extra bit of DSP resources.

**Note:** *Changes to this setting do not take effect until all open sessions containing UAD plug-ins are reloaded.*

## Extra Buffering

Extra Buffering adds an additional 64 samples of buffering for increased DAW compatibility.

**Note:** *This setting is unrelated to UAD plug-ins used within Console.*

If your DAW is incompatible with reduced latency when Extra Buffering is off, a dialog will be displayed indicating that Extra Buffering must be enabled. If this dialog does not appear, disable Extra Buffering to reduce latency in the DAW.

**Note:** *Changes to this setting do not take effect until all open sessions containing UAD plug-ins are closed.*



## Host Compatibility Settings

### Release all DSP resources on Audio Unit bypass (Mac only)

Some Audio Unit hosts dynamically bypass plug-ins when they are not being used during playback (for example, when no audio is present at the current playback position). During this dynamic bypassing, UAD plug-ins stay loaded on the device, reducing glitches in playback.

This setting affects the Audio Units platform only. Checking the option will unload UAD plug-ins from the device during dynamic bypassing. When the option is checked, UAD DSP use may be reduced during dynamic bypassing, but the possibility of artifacts during playback is increased.

***Note:** Changes to this setting do not take effect until all open sessions containing UAD plug-ins are closed.*

### Force Logic to use “Live Mode” for tracks with UAD plug-ins (Mac only)

When UAD plug-ins are used within Logic Pro and this setting is checked, all Logic tracks with UAD plug-ins are forced into Logic Pro’s Rewire “Live Mode” and DAW throughput latency is reduced.

Reduced latency is useful for tracking when Logic Pro’s software monitoring feature is active (when not using Console for input monitoring). When this setting is active, UAD latency is the same as the I/O buffer size.

When Logic Pro’s Rewire Live Mode is inactive (as set in Logic Pro Preferences > Audio > Devices > Rewire Behavior) and this setting is *not* enabled, the minimum Process Buffer Range value (“Small”) in Logic Pro corresponds to 512 samples, meaning the minimum possible UAD latency is 512 samples for UAD-2 (the current latency is displayed in the UAD Meter System Information panel). Latency can be further reduced by using [LiveTrack Mode](#).

***Note:** Logic’s live mode is unrelated to UAD-2’s LiveTrack Mode.*

On multi-processor machines, Logic Pro’s Rewire Live Mode forces all plug-ins on tracks with UAD plug-ins (and any aux/buses fed by those tracks) to run on one processor only. To allow host-based (native) plug-ins to run on all processors under these conditions, deactivate this setting.

***Note:** Changes to this setting do not take effect until all open sessions containing UAD plug-ins are closed.*

## User Interface Settings

### Controls Mode

This setting determines how UAD plug-in parameter knobs respond to adjustment. Three control modes are offered: Circular, Relative Circular, and Linear. Select the desired mode from the Controls Mode menu.

***Tip:** To increase control adjustment resolution when in adjusting rotary controls in circular and relative circular modes, increase the radius of the mouse relative to the knob while dragging (move the mouse farther away from the knob while dragging in a circular motion).*

### Linear (slider)

In Linear mode, the knob is adjusted by dragging horizontally or vertically instead of by rotating. This behavior is similar to moving a fader or other slider control.

### Circular (jump)

In Circular mode, the software knobs behave like physical rotary knobs. Values are changed by clicking on the knob then rotating in a circular direction. When the edge of the knob is clicked, the parameter value instantly jumps to the mouse position.

### Relative Circular (grab)

Relative Circular mode operates similar to Circular mode, but the knob value does not jump to the mouse position when clicked. Instead, the knob value is modified relative to its original value.

In this mode you can click anywhere on the knob to make an adjustment originating at the original value (it's not necessary to click on the current knob position).

### Use Host Setting

When Use Host Setting is checked, the control mode that is set within the DAW's preferences is used (if this feature is supported by the DAW). This setting forces the DAW to override the control mode set here.

***Note:** When Use Host Setting is checked, the UAD Meter Controls Mode settings have no effect if the control mode can be set within the DAW.*

### Toggle initial value modifier (Mac only)

Holding the specified modifier key while clicking a parameter control will toggle between the value of the control when the editor was opened and its last edited value.

This parameter also affects the “select + click” shortcut modifier. See [Shortcuts](#) for a complete list of UAD Meter & Control Panel keyboard shortcuts (the Console application has its own set of shortcuts).

## Automatically send usage statistics to Universal Audio

Enabling this option helps make UAD software better. If checked, statistics will be periodically sent to Universal Audio in the interest of product improvement. These statistics are minimal, and do not impact your system performance. If this box is unchecked, statistics are not sent.

## Info Display

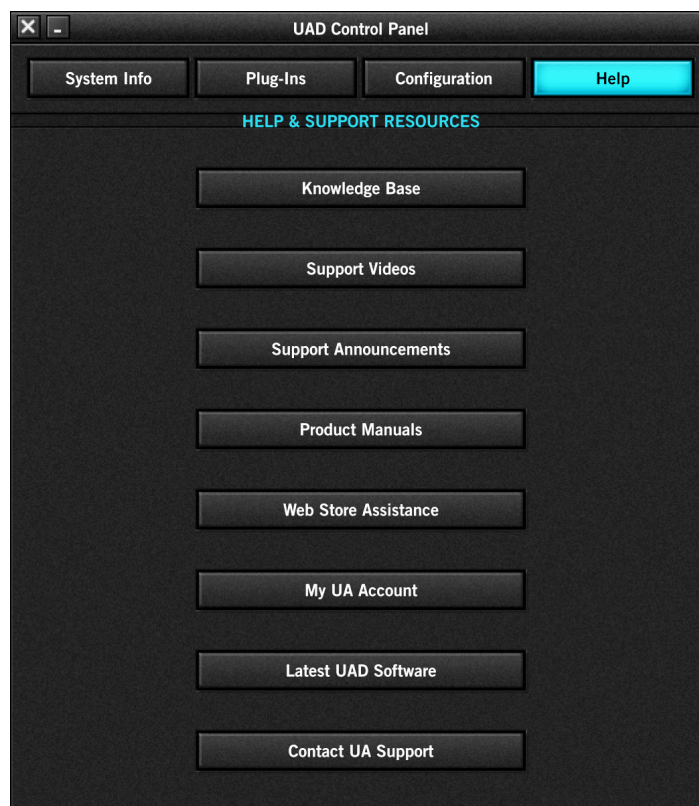
This area displays helpful text about parameters in the Configuration panel. Hover the mouse over a Configuration setting to view the informational text.

## Help Panel

The Help & Support Resources panel (shown below) contains helpful buttons to help you get the most out your Apollo Solo and UAD plug-ins experience.

The button names are self-explanatory. Click a button to open its page on the internet. If the UAD computer isn't online, much of the information is in the manual you're reading now; find the topic in the Table of Contents or the PDF reader's search feature.

Product Manuals is the only button that doesn't link to the internet. Instead, this button opens the UAD Documentation folder containing all UAD product operation manuals. See [About Apollo Solo Documentation](#) for related information.



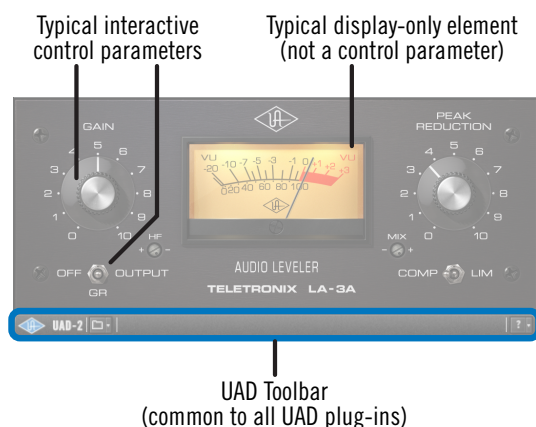
# Using UAD Plug-Ins

## Loading UAD Plug-Ins

Each plug-in host application (Console and/or a DAW) has its own methods for loading (aka instantiating, inserting, launching) and using plug-ins. To load UAD plug-ins within Console, see [Inserting UAD Plug-Ins](#). To load UAD plug-ins within a DAW, consult the DAW documentation.

## The UAD Plug-In Interface

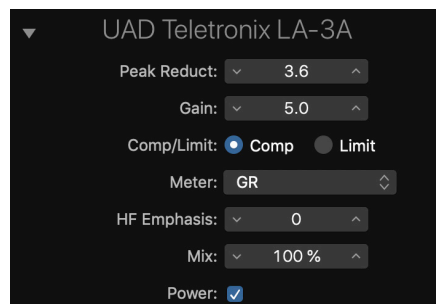
One typical UAD plug-in interface is shown below. Each plug-in contains various control parameters for modifying the sound of the plug-in, display-only elements (such as meters) for visual feedback, and the UAD Toolbar. The UAD Toolbar is common to all UAD plug-ins, and is displayed at the bottom of the interface.



*Typical UAD plug-in interface*

## Controls View

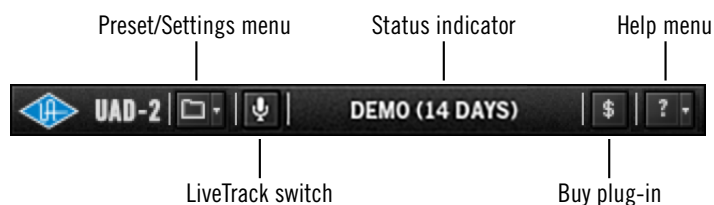
Some DAW applications have an alternate plug-in display mode feature called Controls View, Parameter Mode, or similar terminology. This mode displays the control parameters as a list with simple sliders, switches, and menus (the appearance is controlled by the DAW), which some users may prefer. Consult the DAW documentation for how to display this view. Controls view is not available within Console.



*Typical UAD plug-in as displayed in controls view*

## UAD Toolbar

The UAD Toolbar is located at the bottom of every UAD plug-in (when the plug-in is not in [Controls View](#)). Refer to the illustration below for control descriptions in this section.



UAD Toolbar elements

### Presets/Settings Menu

This menu can be used to manage UAD plug-in settings from within a DAW.

***Tip:** When using plug-in presets within Console, the [Presets Manager](#) within Console is recommended for managing presets (instead of the UAD Toolbar) because of its improved functionality.*

The current settings within a UAD plug-in can be saved to disk as a preset file. The preset can then be subsequently loaded into another instance of the same UAD plug-in title and/or shared with other users. Current UAD plug-in settings can also be copied and pasted between instances of the same UAD plug-in title.

These functions are available via the [Preset/Settings Menu](#).

***Note:** UAD plug-in settings are saved within a project session file by the DAW software and/or Console, and settings are recalled when the session is loaded. This occurs automatically without using the Preset/Settings Menu.*

### Additional Factory Presets

Many UAD plug-ins include additional factory presets that are not within the factory bank (factory bank presets are accessed directly within the DAW). The additional factory presets are automatically installed to the [Default Preset Location](#).

To access the additional presets from within a DAW, use the Load Preset function in the Preset/Settings menu within the UAD Toolbar. the Presets Manager within Console.

### Preset/Settings Compatibility

Load/save and copy/paste of parameter values between the same UAD plug-in title is allowed, as well as load/save/copy/paste between SE and standard plug-ins of the same title (for example, between Neve 33609 and Neve 33609SE).

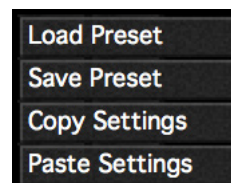
***Note:** Presets and settings between Legacy titles and their newer equivalents with the same title are not compatible (e.g., Fairchild 670 Legacy and Fairchild 670).*

## Load/Save Preset

### Preset/Settings Menu

The Preset/Settings menu is used to load/save plug-in presets and copy/paste plug-in settings when UAD plug-ins are used within a DAW.

To access the Preset/Settings menu, click the folder icon in the UAD Toolbar, then select an item from the drop menu.



**Tip:** When using UAD plug-ins within Console, use Console's Presets Manager instead for its improved functionality.

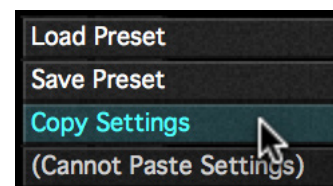
The Preset load/save features support presets but not banks. To load and save banks, use the DAW's bank management feature (if available).

When Load Preset or Save Preset is selected from the Preset/Settings Menu, the standard operating system load/save file dialogs are presented. Preset files can then be loaded (if the plug-in is the same type), or saved to any disk location.

### Copy/Paste Settings

Settings can be copied and pasted directly between UAD plug-ins (within the [Preset/Settings Compatibility](#) guidelines) without using the interim step of creating a preset file.

To copy/paste settings between UAD plug-ins, select Copy Settings from the drop menu of the source plug-in, then select Paste Settings from the drop menu of the destination plug-in.



**Note:** If the menu displays "Cannot Paste Settings," then settings were not copied first or the paste destination has incompatible settings.

### Default Preset Location

When the load/save functions are used, the OS load/save file dialogs are automatically directed to the default preset location. Although UAD presets can be loaded from (and saved to) any disk location, using the default preset location automatically organizes all your presets of the same UAD plug-in title within the same folder.

The Presets folder path below is the parent folder for all UAD plug-in presets. Within the parent folder is a subfolder for each individual UAD plug-in title, and the subfolder contains all the presets for that UAD plug-in.

#### Windows:

- C:\Program Files (x86)\Universal Audio\Powered Plugins\Presets

#### Mac:

- /Library/Application Support/Universal Audio/Presets

## Status Indicator

The Status indicator in the UAD Toolbar displays information about the current state of the plug-in. Each state is described below.

**Start Demo** – When START DEMO is displayed, the 14-day trial period for the particular plug-in has never been activated. Clicking this button will start the demonstration period (you can also start the demo in the UAD Control Panel’s [Status Column](#)).

**Important:** *The 14-day demo period can only be activated once, and cannot be stopped or restarted during this period. Don’t activate demo mode unless you have adequate time to thoroughly evaluate its sound and functionality.*

**Demo Active** – After starting the demo, and when the plug-in is still within the active 14-day trial period, the number of days remaining in demo mode is displayed here.

**Disabled** – When DISABLED is displayed in red, the plug-in will not process audio. This can occur in two situations: either the demo period has expired (click the Buy button!), or the UAD DSP is overloaded and there are not enough UAD resources to run the plug-in.

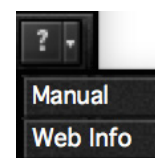
**Blank** – When no text is displayed in the Status area, the plug-in is licensed and operating normally. In this state, the Buy button is not displayed.

## Buy (\$)

If the UAD plug-in is unlicensed, the Buy (\$) button is displayed. Clicking the “\$” button opens the plug-in’s page at the UA store so you can purchase the license. See [Buying UAD Plug-Ins](#) for purchasing details.

## Help (?) Menu

The Help drop menu contains two convenient shortcuts. To select the shortcuts, click the “?” button in the UAD Toolbar, then a choose shortcut from the menu.



**Manual** – This option opens the UAD Plug-Ins Manual, where all features and functions of all individual UAD plug-ins developed by Universal Audio are documented.

**Note:** *With Direct Developer (3rd-party) plug-ins, the manual provided by the developer is opened.*

**Web Info** – This option opens the plug-in’s page at the UA store so you can learn more about and/or buy the plug-in.

## LiveTrack Mode

LiveTrack mode reduces latency on an active UAD plug-in to the lowest possible amount when the UAD plug-in is used within a DAW. This feature is useful for monitoring UAD-processed audio when recording live performances via software monitoring in the DAW.

**Note:** *LiveTrack is not available for UAD plug-ins used within Console, where Realtime UAD Processing always minimizes latency.*

Reduced latency with LiveTrack is accomplished by circumventing standard I/O buffering processes. In LiveTrack mode, UAD signal data is transferred and processed immediately instead of being buffered.

**Note:** *LiveTrack mode is unavailable on all UAD-2 devices whenever any UAD-2 FireWire device is connected to the system.*

## Increased Host Loading

When LiveTrack is active, host CPU loading increases. The host load is directly proportional to the DSP load of the UAD plug-in(s) in LiveTrack mode. However, host CPU is never used for UAD plug-in processing with LiveTrack.

## Extra Latency with LiveTrack

When [Extra Buffering](#) is enabled or when [Upsampled UAD Plug-Ins](#) are used with LiveTrack, latency is increased. Extra Buffering adds 64 samples, and each plug-in with additional latency using LiveTrack adds the value from the chart in the UAD Plug-Ins Manual.

**Note:** *For more detailed information about latency and buffers, see [Latency & Delay Compensation](#)*

## LiveTrack Activation

To activate LiveTrack Mode, click the microphone icon switch in the UAD Toolbar. LiveTrack Mode is active when the mic icon is red.

LiveTrack Mode can be activated simultaneously on multiple UAD plug-ins. However, host system CPU loads will increase with each LiveTrack Mode instance.



*LiveTrack switch as it appears when active*



## Adjusting Parameters

The parameter settings within each UAD plug-in can be adjusted to achieve a desired sonic effect. Parameter values are easily modified by dragging sliders, rotating knobs, clicking switches and buttons, or by selecting values from a drop menu. The functions of all individual UAD plug-in parameters are detailed in the UAD plug-in manuals.

The parameter adjustment style can be Circular, Relative Circular, or Linear. For descriptions of these options, see [User Interface Settings](#).

***Tip:** To increase adjustment resolution when adjusting rotary controls in circular and relative circular modes, increase the radius of the mouse relative to the knob while dragging (i.e., move the mouse farther away from the knob while dragging).*

### Text Entry

Parameters that have a value display field can be modified directly with text entry. To enter a parameter value using text entry, single-click the parameter value text field. The text value will highlight, indicating it is ready to receive a new value. Type in a new value, then press Return, Enter, or Tab, or click outside of the text box. Press Esc if you want to revert to the prior setting without entering the new value.

Values entered via text entry are rounded to the closest significant digit. If an entered value is out of range, it will be ignored.

### Time Values

To enter time values, the units must be specified; m = milliseconds, and s = seconds. For example: To enter 400 milliseconds, type 0.400s or 400m. To enter 1.5 seconds, type 1.5s or 1500m.

### Mouse/Wheel Scroll

If your input device has a scroll function, it can be used to adjust knob and slider controls. Place the mouse cursor over any knob or slider control, then use the scroll function to change the parameter value.

***Note:** Some DAWs do not support parameter scrolling.*

### Keyboard Control (Mac)

If you control+click a parameter, that control is selected for keyboard control. This feature is particularly useful when control adjustment is set to circular mode, and you want to finely adjust a value.

Normally, clicking on a control in circular mode makes the value jump to the location clicked. Control+clicking selects the control so the keyboard can be used to adjust the value without causing its value to jump to the cursor location first.

## Shortcuts

The table below lists the keyboard shortcuts that are available for modifying UAD plug-in parameter values. When using keyboard shortcuts, the last edited control will be modified.

On Mac systems, you can use control-click to select a different control as the target for keyboard shortcuts without changing the control's value.

**Note:** *Not all DAW applications support sending keystrokes to plug-ins.*

### UAD Plug-In Keyboard shortcuts

Keyboard Action	Result
Control + Click Parameter (Mac only)	Select parameter for keyboard control (without changing its value)
Shift + Drag	Fine Control
UpArrow RightArrow Shift + PageUp	Increment Fine
DownArrow LeftArrow Shift + PageDown	Decrement Fine
Shift + UpArrow Shift + RightArrow PageUp	Increment Coarse
Shift + DownArrow Shift + LeftArrow PageDown	Decrement Coarse
Control + Click parameter (Windows) Modifier* + Click parameter (Mac)	Toggle initial editor setting (the value when the editor window was last opened)
Control + Shift + Click parameter (Windows) Modifier* + Shift + Click parameter (Mac)	Revert to initial editor setting (the value when the editor window was last opened)
*Modifier key set in UAD Meter & Control Panel application's Configuration panel	

## DSP Loading Notes

- UAD devices feature either one, two, four, or eight (SOLO, DUO, QUAD, or OCTO) on-board DSP cores for UAD plug-in processing. Apollo Solo features UAD-2 SOLO core processing.
- UAD DSP use is proportional to the sample rate. Twice as many UAD plug-ins can be used at a 48 kHz sample rate versus a 96 kHz sample rate, and so forth.
- UAD plug-ins within Console can only run on Apollo Solo's built-in DSP. If a UAD-2 DSP accelerator is added to the system (such as UAD-2 Satellite), the additional DSP can be used for UAD plug-ins within a DAW, but not for Realtime UAD Processing within Console.
- Bypassing individual components within some UAD plug-ins can conserve UAD resources. For example, bypassing the compressor in the Precision Channel Strip when only the EQ is in use, and/or bypassing any of the unused bands of the Precision Channel Strip EQ will use less UAD DSP (unless DSP LoadLock is enabled).
- The [UAD Instance Chart](https://help.uaudio.com) at [help.uaudio.com](https://help.uaudio.com) lists the amount of DSP used by each UAD plug-in. The chart can help determine which UAD plug-ins to use within available UAD resources.
- Specific UAD plug-ins have the ability to conserve UAD resources when individual features within the plug-in are inactive. These plug-ins are marked with an asterisk (\*) in the [UAD Instance Chart](https://help.uaudio.com) at [help.uaudio.com](https://help.uaudio.com). Note that [DSP LoadLock](#) must be disabled to take advantage of this feature.
- Apollo Solo uses UAD DSP and memory for its internal digital mixer and Input Delay Compensation engine. Therefore, the UAD Meter gauges will indicate loads (when UAD hardware is connected) even if UAD plug-ins are not inserted in Console or the DAW.
- The host computer system memory and CPU are never used for UAD plug-in processing within a DAW. However, there will be a small additional load on the host CPU induced by data transfers and user interface operations. This is unavoidable when using any DSP device.
- When [LiveTrack Mode](#) is active, host CPU load is increased.
- Within a DAW, UAD plug-ins can run at the same time as native (host CPU based) plug-ins, and in any combination. However, native plug-ins cannot be loaded within Console.

## Mono (m) UAD plug-ins

UAD VST plug-ins with “(m)” in the name are monophonic versions of the plug-in for use within VST-based DAWs.

Standard UAD VST plug-ins (which support both stereo and mono configurations) do not consume additional UAD DSP on mono sources when loaded in DAWs that use true-mono processing (for example, Apple Logic Pro, Avid Pro Tools, and Steinberg Cubase).

Some DAWs (for example, Ableton Live and Cakewalk Sonar) do not use true-mono processing on mono signals. In these DAWs, using the mono (m) versions may conserve UAD DSP when used on mono sources.

**Note:** *Apollo Solo’s Console always uses true-mono processing, therefore Mono (m) UAD plug-ins are not available within Console.*

UAD mono (m) plug-ins are not available in Audio Units or AAX 64 format. All major AU and AAX 64 DAWs (e.g., Apple Logic Pro, Avid Pro Tools) support true-mono processing.

**Note:** *Some UAD plug-ins do not consume less DSP even when used in a true-mono configuration. For details about mono vs. stereo DSP use, see the [UAD Instance Count Chart](#).*

# Tempo Sync

The time-based parameters of some UAD plug-ins can be synchronized to the tempo of the host application using the Tempo Sync feature.

**Note:** *Not all DAW applications support Tempo Sync. In these hosts, the tempo sync features will not function.*

When Tempo Sync is activated, the time-based parameters that are available for synchronization are changed to note duration values, and will sync to the tempo of the host application using the displayed note value.



*Tempo Sync switch within Precision Delay Mod*

## Tempo Sync Plug-Ins

The Tempo Sync feature is available with the UAD plug-ins listed below.

CS-1 Channel Strip	Moog Multimode Filter XL
Cooper Time Cube	MXR Flanger/Doubler
Galaxy Tape Echo	Precision Delay Mod
EP-34 Classic Tape Echo	Precision Delay Mod L
Korg SDD-3000 Digital Delay	Precision Reflection Engine
Moog Multimode Filter	Roland RE-201 Space Echo
Moog Filter Multimode SE	

**Note:** *This table does not include UAD Direct Developer (3rd-party) plug-ins.*

## Sync Activation

To activate Tempo Sync, click the “Sync” button within the plug-in interface. The Sync button LED will illuminate and the time parameters will change from a time-based display to a note value display.

**Note:** When Tempo Sync is activated, the plug-in will automatically switch the time or rate parameter(s) to the nearest available note value(s) given the range of the parameter in question and the current tempo.

## Available Note Values

The note values that are available for selection are listed below. The values are listed in musical notation as a division of measures. For example, 1/4 = one quarter note, 1/1 = one whole note, 4/1 = four whole notes, and so forth.

The available note values were chosen to allow syncing to tempo in odd time signatures as well the common 4/4 time signature.

LFO rate parameters have their note values listed from longest to shortest, since long note values correspond to slow LFO rates.

### Available Tempo Sync Note Values

1/64D*	1/8	5/8	4/1
1/64	5/32*	1/1T	5/1
1/32T	1/4T	1/2D	6/1
1/32	1/8D	1/1	8/1
1/16T	1/4	5/4	9/1
1/32D	5/16	1/1D	12/1
1/16	1/2T	7/4	16/1
1/8T	1/4D	2/1	
1/16D	1/2	3/1	

D = Dotted  
T = Triplet  
\* = Galaxy Tape Echo & RE-201 only

A quarter note is always a quarter note, independent of the time signature. In different time signatures a quarter note can represent different numbers of musical beats (e.g. 6/8) or different fractions of a bar (e.g. 5/4).

Example: The time signature is 6/8 and the delay time tempo sync note value is 1/4. If a sound occurs on beat one of the measure then its delay will occur on beat 3, which is 1/4 note (i.e., two 8th notes) later.

**Note:** The “beat” value in a sequencer’s BPM tempo setting always refers to a quarter note, independent of time signature.

## Range Limits

Some Tempo Sync parameters cannot access the entire note range in [Available Tempo Sync Note Values](#). Because the original (non-tempo sync) range of the time-based parameters within each plug-in is limited, if the host tempo is too fast or too slow, the tempo sync note value may not be able to be achieved within the constraints of the original parameter.

### Out of range

When a parameter note value is out of range of the current tempo note value, the note value is displayed in parentheses. In this case, the parameter's minimum (slow tempo) or maximum (fast tempo) value is used instead of the displayed value.



*Tempo Sync value out of range (parentheses)*

## Entering Values

In addition to adjusting the parameter control, the following methods can be used for entering Tempo Sync values.

### Arrow Keys

After clicking the parameter to select it, the computer's arrow keys can be used to increment/decrement through available note values.

### Text Entry

Any notation values can be entered (fraction or decimal), and the values are automatically converted to the nearest appropriate setting.

Example: If  $3/4$  or  $6/8$  is entered using text entry,  $1/2D$  is displayed because a dotted half note equals three quarter notes, which is the duration of one measure in a time signature of  $3/4$  or  $6/8$ . If  $12/8$  is entered with text entry,  $1/1D$  is displayed because a dotted whole note equals six quarter notes, which is the duration of one measure in a time signature of  $12/8$  (or two measures in a time signature of  $3/4$  or  $6/8$ ).

This means you can create a tempo sync duration of one measure for any time signature by simply typing in the time signature (assuming there is a match in the beat table).

Similarly, if  $1/12$  is entered with text entry,  $1/8T$  is displayed because an eighth note triplet is equivalent to one-twelfth of a measure (if in  $4/4$  time).

## Precision Delay Modes with Tempo Sync

The UAD Precision Delay Mod and UAD Precision Delay Mod L plug-ins have a Mode menu that switches the plug-in operation between delay, chorus, and flanger mode. In these plug-ins, when the Mode is set to DUAL DELAY and PING PONG, the delay Time and modulation Rate parameters are simultaneously available for Tempo Sync.

However, when the plug-in is set to a CHORUS or FLANGER mode, only the Rate is available for Tempo Sync. This enables the more typical and musical chorus/flange effect by only syncing the modulation Rate to the tempo while the delay time remains constant.

## Galaxy Tape Echo & Roland RE-201 Sync

When the Galaxy Tape Echo and Roland RE-201 plug-ins are in Tempo Sync mode, note values can be imprecise due to the fixed tape head relationships.



Values that are imprecise approximations (but are within the available delay time range) are displayed with a “+” or “-” symbol. The leading head in the current mode is accurately synced; the other values are based on the fixed tape head relationship.

**Note:** When a parameter note value is out of range of the current tempo note value in these plug-ins, the note value flashes instead of in being parentheses.



# UA Account & Store

## Account Overview

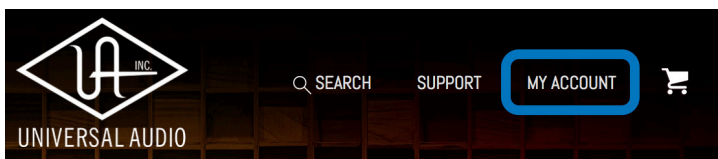
Your Universal Audio account is where all your UAD devices, and their associated UAD plug-ins, are registered and managed. A UA account is required to register and authorize your Apollo Solo hardware, download UAD software, and receive customer support.

## Device Registration

The account creation and device registration process is triggered automatically whenever a new UAD device is recognized by the UAD software. Our web pages guide you through the process.

## Accessing Your Account

To view your account pages, click the MY ACCOUNT link at the top of web of pages at [www.uaudio.com](http://www.uaudio.com).



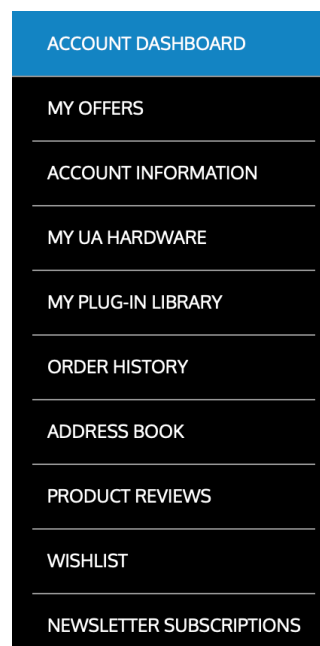
When you're not already logged in, the LOG IN link appears instead of the MY ACCOUNT link. In this case, click LOG IN to enter your email and password and access your account.

You have the option to stay logged in so you don't have to enter credentials with each visit. If you forgot your password, the store can email a password reset link to you.

## Account Details

The [My Account](#) pages are available when logged in. These pages contain all details about the account such as registered UAD devices, licensed UAD plug-ins, and account preferences.

The account menu, shown at right, is used to navigate the account pages. Click an item in the menu to view that account page.



## Store Overview

The Universal Audio online store is where optional UAD plug-in licenses are purchased and UA coupons are redeemed.

### Bundled Plug-Ins

UAD plug-ins that are bundled (included) with Apollo Solo are automatically issued to your UA account when the device is registered. After registration is complete, authorize the UAD system to run the bundled plug-ins.

**Note:** *UAD devices must be registered and authorized to use bundled plug-ins.*

### Optional Plug-Ins

UAD plug-ins that are not bundled with the UAD device require an optional license to run without restrictions. After purchasing a UAD plug-in, the UAD device(s) in the system need to be manually authorized to run the additional plug-in.

Our web pages guide you through the purchase and authorization process.

### UAD Plug-Ins Are Already Installed

The UAD software installer always installs the complete suite of available UAD plug-ins during installation. When you purchase an optional license, you don't download that individual plug-in. Instead, you simply re-authorize your system, which activates the plug-in file that is already installed.

**Important:** *Older versions of UAD software may not include all the latest UAD plug-ins. To ensure all UAD plug-ins are installed, and for optimum performance, update to the latest UAD version (see [Check for Updates](#)).*

### Coupons

Promotional coupons have dollar values that are as “good as cash” for buying UAD plug-ins. Coupons are applied to your UA account automatically. The coupon dollar amount is displayed in your account as a credit, ready to be applied to your store purchase.

Coupons expire after a limited time period, and they can be used only once.

**Tip:** *Coupons are a great reason to sign up for UA's promotional email. These options are set in the Newsletter Subscriptions page in [My Account](#).*

# UAD Authorization Overview

**Note:** This section is an overview of the UAD authorization system. For step-by-step authorization instructions, see [UAD Authorization Procedure](#).

## My Hardware

The UAD devices (Apollo Solo is a UAD device) and UAD plug-ins that you own are found on your MY HARDWARE page at [www.uaudio.com/my/account/hardware](http://www.uaudio.com/my/account/hardware). The My Hardware page keeps track of your registered UAD devices and UAD plug-in licenses and is managed automatically by the UA store and UAD software.

**Tip:** The current UAD plug-in license state is also shown in the [Plug-Ins Panel](#) within the UAD Meter & Control Panel application.

## UAD System

All UAD devices registered to the UA account, and all UAD plug-in licenses for those devices, are grouped as a system on the My Hardware page. Licensed UAD plug-ins are only authorized to run on the UAD devices associated with the same account and system.

## Account Creation and Device Registration

Creating a UA account and registering the UAD hardware is only needed once during initial device installation. After registration, authorization is performed automatically in the background by the UAD Meter & Control Panel application each time the computer is started.

## Adding Additional UAD Devices

If a second (or more) UAD device is added to the computer that already has the UAD software installed, the new device(s) is automatically detected by the UAD software. Upon detection, the web browser opens, you are guided to register the new device, and the new device is added to your account.

## Authorizing Newly-Purchased UAD Plug-Ins

When a UAD plug-in is purchased at the UA store, it needs to be manually authorized. The store guides you through the process, or see the [UAD Authorization Procedure](#) for instructions.

## Authorizations Are Stored On UAD Device

During authorization, the UAD plug-in license state is stored on the UAD device. If the device is moved to another computer, it's not necessary to reauthorize the device.

## Demo Mode

All unlicensed UAD plug-ins include a free 14-day trial evaluation period. When the demonstration mode is activated, the plug-in runs without functional limitations for 14 days. Demo mode can be activated once only. After the demo trial period has expired, demo mode cannot be activated again on the same UAD device.

If an unlicensed plug-in is loaded and its demo has never been started, a dialog appears with instructions to start the demo and the option to visit the UA store to purchase the license. If you don't start the demo or purchase a license, the plug-in interface appears and its controls can be manipulated, but audio is not processed by the plug-in.

**Important:** *The 14 day demo period can only be activated once, and cannot be stopped or restarted during this period. Activate demo mode only when you have adequate time to thoroughly evaluate its sound and functionality.*

## Demo Reset

As a courtesy, each time a new UAD plug-in is purchased, all expired demo periods are automatically reset so all UAD plug-ins with expired demos can be evaluated again.

## Demo Activation

### To activate demo mode:

1. Ensure the UAD hardware and software is already installed and properly configured.
2. Open the [Plug-Ins Panel](#) within the UAD Meter & Control Panel application.
3. Locate the row for the UAD plug-in you want to evaluate (scroll if necessary).
4. In the [Status Column](#), click the START DEMO button for the UAD plug-in. A confirmation window appears and the timed demo can be activated or demo activation can be cancelled.

**Note:** *Manipulating the computer's system date and time may result in a decreased demo period.*

## Buying UAD Plug-Ins

To obtain optional UAD plug-in licenses, simply visit [www.uaudio.com](http://www.uaudio.com), browse the available plug-ins at the secure UA store, complete your purchase with several payment options, and authorize the new plug-in(s). You can also apply any coupon credit that is available from promotional offers.

Lots of product information such as features, specifications, audio/video examples, and reviews are available on the plug-in product pages to help you make informed buying decisions.

### Purchase Procedure

#### To purchase optional UAD plug-in licenses:

1. Visit the UA store at [www.uaudio.com](http://www.uaudio.com).
2. Add the items you want to purchase to your shopping cart. You'll need to login to your UA account if not already logged in.
3. When ready to complete your purchase, click the Shopping Cart icon at the top of the page, then click the CHECKOUT button. The payment page appears.
4. Select payment method and provide payment details. If applicable, apply any discount coupon codes.
5. Click the PLACE YOUR ORDER button **once only**. The transaction is processed, the order confirmation page appears, a confirmation email is sent, and the UAD plug-in license(s) is issued to your UA account.
6. Authorize the UAD device(s) by following the instructions on the next page.

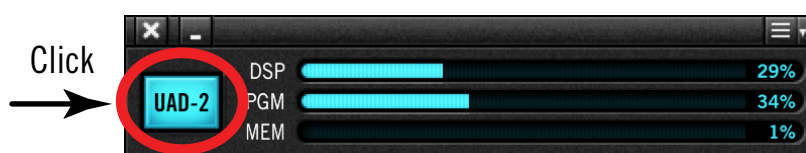
## UAD Authorization Procedure

UAD plug-ins are automatically authorized each time the computer is started. However, the UAD system must be manually authorized whenever a plug-in is purchased from the UA store.

**Note:** Follow this procedure to manually authorize a new UAD plug-in purchase whenever you buy a plug-in at the UA store.

**To manually authorize UAD plug-ins to run on the UAD device:**

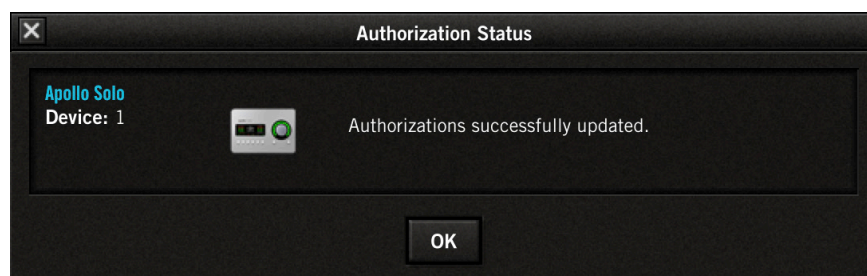
1. Open the UAD Meter & Control Panel application (see [Launching the Application](#) for methods).
2. Access the [Plug-Ins Panel](#) within the application by clicking the blue “UAD-2” button in the UAD Meter window.



3. Click the “Authorize Plug-Ins” button in the Plug-Ins panel.



4. After a few moments the Authorization Status window appears. Click OK to close the window.



**UAD plug-ins are now authorized and ready for use.**

## Offline UAD Authorization

**Important:** UAD devices must be registered and UAD plug-ins must be authorized before they can be used.

UAD plug-ins are automatically authorized each time the computer is started if the system is connected to the Internet. If the UAD computer is not connected to the Internet, you will need:

- Manually transfer a URL into the browser of a web-enabled computer
- Download an authorization file onto the web computer
- Transfer the authorization file back to the UAD computer

These steps are detailed below.

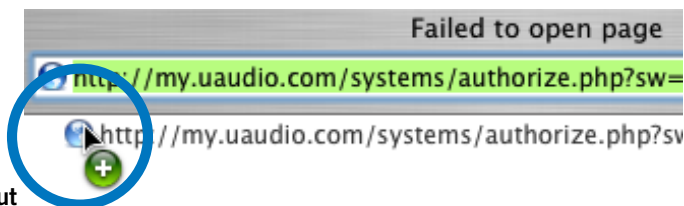
### To obtain and apply the UAD authorization file if not connected to the internet:

1. Install the UAD software and the UAD hardware before proceeding. The system must be operating properly. See [Getting Started](#) for details.
2. Launch the [UAD Meter & Control Panel](#) application and open the [Plug-Ins Panel](#).
3. Click the [Authorize Plug-ins button](#). The default web browser opens with the registration URL in the address bar (and you may get an error that the computer is not connected to the Internet).
4. You must enter this URL into a web-connected computer, so either:
  - a. Drag the URL icon in the browser's address bar to the Desktop to create a weblink shortcut (preferred, to prevent transcription errors) then transfer the weblink shortcut to the internet computer via a storage device or network, OR
  - b. Copy/paste the URL into a file that can be transferred (or carefully write down the URL, EXACTLY as it appears in the address field).

1. Click+Hold URL icon in browser address bar



2. Drag URL icon to Desktop or flash drive to create a link shortcut



*Creating a web location shortcut on the offline UAD system for easier transfer of the URL file to an online system*

5. Go to the URL using a web browser on an Internet-connected computer. Double-click the transferred weblink shortcut, or enter the URL as previously noted.
  - If you don't already have a UA account, you are directed to create one. Follow the online instructions.
  - If you already have a UA account, login with your email address and password. If your password is lost, the store can email password reset link to you.
6. Your device will be automatically registered and added to your [My Hardware](#) page, and your authorization file is generated.
7. The authorization file named "auth.uad2" should begin downloading automatically (if not, click the download authorization link).
8. Transfer the authorization file to the UAD computer via a storage device or network.
9. For optimum results, quit all open audio host applications (DAWs).
10. Double-click the authorization file. The authorization is loaded onto the UAD device(s) and after a few seconds the "Authorizations Status" window appears.

**Offline UAD authorization is complete and UAD plug-ins are ready for use.**



# Expanded UAD Systems

Apollo Solo can be combined with Universal Audio's line of Apollo Thunderbolt audio interfaces and UAD-2 DSP accelerators to increase I/O channel counts and UAD DSP processing as your system needs grow.

Up to four Universal Audio Thunderbolt audio interfaces can be connected and used together as a single consolidated multi-unit I/O and DSP processing system with Realtime UAD Processing. Additionally, UAD-2 DSP accelerators can be added to UA's I/O system for additional UAD DSP processing within a DAW.

**Note:** UAD-2 DSP accelerators can only be used for UAD plug-in processing within a DAW. Adding UAD-2 DSP accelerators to an Apollo system does not increase available UAD DSP on Apollo inputs for Realtime UAD Processing.

## Multi-Unit Interface Cascading

When multiple Universal Audio Thunderbolt audio interfaces are connected, the I/O complement of all devices is available within the DAW. Individual units are interconnected with single Thunderbolt cables and system clocking is controlled automatically. Operating a multi-unit system is nearly identical to that of a single-unit system for seamless I/O and DSP expansion.

## Console Integration

When multi-unit cascading, all UA audio interfaces are controlled within a single Console window. The number of Console inputs automatically increases to accommodate the additional hardware and virtual inputs. All interfaces share the same monitor, auxiliary, and cue mix buses for integrated mixing convenience. Up to four independent cue mix buses and two alternate monitoring outputs are available, and all headphone outputs can be independently addressed.

## Unlimited Options

A total of six UAD hardware devices can be used together with a single computer system. For example, you can connect four UA audio interfaces (one desktop unit maximum) with two UAD-2 DSP accelerators, or two UA interfaces with four UAD-2 DSP accelerators. A single system can contain up to 72 x 96 channels of analog/digital I/O with 32 UAD DSP processing cores for an extremely powerful and cost effective system.

## Expanded System Details

Full details about expanded UAD systems is beyond the scope of this manual. For complete documentation on how to expand, connect, and operate UAD multi-unit interface systems, including specific constraints, see "Multi-Unit Cascading" in the Apollo Thunderbolt Software Manual. For details about adding UAD-2 DSP accelerators, see "Multiple UAD Devices" in the UAD-2 System Manual.

**Note:** For the latest multi-device compatibility information with Apollo Solo, visit [help.uaudio.com](http://help.uaudio.com).

# Latency & Apollo Solo

## Delay Compensation with Apollo Solo

System latency encapsulates all latencies induced within the typical digital audio workstation environment. See [Latency Basics](#) for a detailed overview of where, when, and how latency (delay) is induced in the DAW environment.

***Note:** Upsampling latency, input latency, and all other system latencies are automatically compensated by Console and modern DAWs when delay compensation is enabled in the host application.*

### Driver Reporting

Any system latency that is induced by Apollo Solo's I/O, Console, and/or UAD plug-ins is reported by Apollo Solo's device drivers to the host audio software that is using the device.

The host software (e.g., Console and the DAW) uses this reported device latency for its automatic delay compensation (ADC) engine. When ADC is enabled in Console and the DAW, phase coherency (time alignment) is maintained throughout the recording, overdubbing, and mixing process.

### Upsampled UAD Plug-Ins

Some UAD plug-ins are *upsampled*, meaning their internal sample rate is increased to achieve sonic design goals. Depending on the session sample rate, upsampled UAD plug-ins can add additional latency when used in the Console Mixer and/or a DAW.

Although the latency added by upsampled UAD plug-ins is negligible (typically between 0-300 samples, depending on the plug-in and sample rate), this extra latency can affect phase coherency in a session. However, phase alignment is managed automatically by Input Delay Compensation in Console and Automatic Delay Compensation in the DAW when these features are enabled.

***Note:** Specific upsampling latency values for UAD plug-ins are listed in the [UAD Plug-Ins Manual](#).*

### Automatic Delay Compensation in the DAW

Generally speaking, ADC should always remain enabled in the DAW when using Apollo Solo (and any other audio interface), regardless of whether or not Console is used at the same time. The DAW's ADC engine performs all necessary housekeeping to keep tracks phase-aligned, regardless of the latency source (if any).

## Input Delay Compensation in Console

Console has automatic Input Delay Compensation (IDC), which is controlled by the [Input Delay Compensation](#) menu in Console Settings. Console IDC maintains phase alignment across all Console inputs when upsampled UAD plug-ins are used in Console.

Console's IDC is useful when multiple Console inputs are used on a single source. For example: If two microphones are used on an acoustic source (such as a acoustic guitar) and an upsampled plug-in is used on one of the mic channels but not the other, without input delay compensation, the phase of the two mic channels would no longer be aligned (mics must be exactly equidistant from the sound source to remain phase aligned).

### How Console IDC works

To maintain phase alignment, Console IDC automatically adds small amounts of delay to each Console input that is *not* delayed by [Upsampled UAD Plug-Ins](#). In other words, all compensated inputs are automatically delayed by the same amount.

### When To Use Console Input Delay Compensation

Console IDC is required to maintain phase alignment only when **BOTH** of the following conditions are active:

1. Multiple Console inputs are used for a single source (such as a drum kit using multiple microphones), AND
2. Any of those input channels contain upsampled UAD plug-ins.

*Tip: When IDC is not needed, disable Console IDC for the lowest possible input latency.*

### Effect of Console's IDC setting

*Note: Console's IDC value is set with the [Input Delay Compensation](#) menu in Console Settings. By default, Console IDC is enabled with the Short value of 100 samples.*

#### In Console

In Console, the amount of delay added by the IDC engine is automatic. Only the minimum amount of delay actually required to compensate the input(s) is applied (up to the maximum value of the setting), maintaining the lowest possible latency for phase alignment at all times.

For example: When Console's IDC value is set to Short (100 samples – the default value) and only 31 samples is actually required to compensate, then only 31 samples of delay will be applied to the other Console inputs.

#### In the DAW

In the DAW, the amount of delay added by Console's IDC engine is static. The extra samples are always added to all inputs in the DAW, even if no upsampled plug-ins are active. However, this overall additional input latency is reported by Apollo Solo's drivers, so it is automatically compensated by the DAW's ADC.

For example: When Console's IDC value is set to Short (100 samples – the default value) and only 31 samples is actually required to compensate, 100 samples is still added to all inputs in the DAW. If using software monitoring via the DAW, the extra (unnecessary) delay could be detected.

### **Software monitoring with Console IDC**

When software monitoring via the DAW and Console IDC is enabled, the lowest effective Console IDC setting is recommended to minimize monitoring latency. If using Console for monitoring and software monitoring via the DAW is disabled, the IDC value isn't as critical because Console will dynamically deliver the lowest possible monitoring latency.

### **UAD-2 DSP Resources**

Console IDC uses a small percentage of Apollo Solo's DSP. To maximize UAD resources available for UAD plug-ins, disable Console IDC if it is not needed.

### **Special Cases: Precision Multiband, Ampex ATR-102, and AKG BX 20**

These three UAD plug-ins have extra latency values that exceed the capacity of Console's IDC engine even at the maximum setting (Long). These plug-ins are designed to be used on the outputs of a DAW during mixdown, where latency is not a consideration. If using these plug-ins in Console, the Input Delay Compensation feature may need to be disabled or ignored.

## **Minimizing UAD Input Latency When Software Monitoring**

If the DAW's I/O buffered software monitoring is used when performing and UAD plug-ins are used within the DAW, input latency can be *much* higher versus using Console for hardware input monitoring. However, there are ways to mitigate the additional input latency if software monitoring is preferred.

When software monitoring, input latency is determined by the session sample rate, the DAW's buffer size setting, and the number of serial (i.e., stacked or chained) UAD plug-ins. To minimize input latency, try any or all of these mitigations:

- Use a higher session sample rate
- Use a lower I/O buffer size
- Use fewer serially inserted (stacked/chained) UAD plug-ins
- Use UAD-2 LiveTrack Mode

### **UAD-2 LiveTrack Mode**

UAD-2 PCIe cards, UAD-2 Satellite Thunderbolt, and UA Thunderbolt audio interfaces (all UAD devices except UAD FireWire devices) offer an advanced buffering architecture that delivers reduced latency when tracking through UAD plug-ins that are loaded in a DAW. To enable the feature, activate [LiveTrack Mode](#) on the UAD plug-in(s) when software input monitoring. LiveTrack Mode is enabled by clicking the mic button in the UAD Toolbar at the bottom of the UAD plug-in interface. LiveTrack is active when the mic button is red.

# Latency Basics

Latency (delay) is an inherent factor in digital audio systems because of A/D-D/A conversion, I/O buffering in the DAW, plug-in signal processing, and other aspects.

Although there are ways to mitigate latency (such as delay compensation and/or low-latency monitoring), it always exists to some degree when working with systems that combine analog and digital audio. These concepts are explained in greater detail below.

## Audio Interface Latency

Every audio interface that performs A/D and/or D/A conversion induces latency as a result of the conversion process. This inherent A/D–D/A latency is essentially undetectable. A/D–D/A latency usually depends on the sample rate, with higher sample rates inducing less latency (higher rates = less time required for conversion).

An audio interface’s “analog I/O round-trip latency” specification refers to how long it takes for an analog signal at an interface input to reappear at the same interface’s analog output after both A/D and D/A conversion. Apollo Solo’s audio interface analog I/O round-trip latency is 1.1 milliseconds at a sample rate of 96 kHz.

## DAW Latency

Most DAWs use hardware I/O buffering to shuttle audio data back and forth between the audio interface and the DAW. This I/O buffering induces additional latency with any audio interface (not just Apollo Solo).

### I/O Buffer Size

The amount of DAW latency is usually determined by the DAW’s I/O interface *buffer size* setting. Low buffer sizes reduce latency, but increase the host computer’s CPU loading. If the buffer size is set too low, host CPU overloads and/or audio artifacts such as clicks, distortion, or dropouts can occur.

### Monitoring Live Performance During Recording

DAW latency can be a problem during recording when software monitoring via the DAW’s mixer, because the buffering delay is a distraction; an artist cannot hear their performance in realtime. DAW latency when recording with Apollo Solo is mitigated by using Console for live performance input monitoring, where I/O buffering latency does not apply.

### Time-Alignment Of Newly-Recorded Tracks With Previously-Recorded Tracks

Dealing with latency is also important with DAWs for time-alignment of newly-recorded tracks and previously-recorded tracks which are inevitably shifted from the I/O buffering process.

The solution is to use the automatic delay compensation (ADC) feature of the DAW. Modern DAWs, and Console, have automatic delay compensation. For more information about system latency and its compensation, see [Delay Compensation with Apollo Solo](#).

## Console Latency

Apollo Solo's Console mixer is used for low-latency input monitoring (cue mixing) of Apollo Solo's analog inputs. Using Console to monitor Apollo Solo's inputs may or may not add to the inherent analog I/O round-trip latency, depending on how it is configured, as described below:

**Console without UAD plug-ins** – When Console is used without UAD plug-ins, monitoring Apollo Solo's inputs via Console does not add any latency. In this configuration, Apollo Solo's analog I/O round-trip latency is still 1.1 milliseconds at 96 kHz.

**Console with Realtime UAD Processing** – When Console is used for Realtime UAD Processing with UAD plug-ins that are not upsampled, monitoring Apollo Solo's inputs via Console *does not add any latency*.

In this configuration, Apollo Solo's analog I/O round-trip latency is still 1.1 milliseconds at 96 kHz, even if up to five UAD (non-upsampled) plug-ins are serially inserted (chained) on a single Apollo Solo input.

Multiple Apollo Solo inputs can have up to five UAD (non-upsampled) plug-ins each (up to the limit of available DSP resources), and this configuration also *does not add any latency*.

***Note:** Upsampled UAD plug-ins add latency when used in Console or a DAW. See [Upsampled UAD Plug-Ins](#) for details.*

**Console Auxiliary Buses** – The outputs of the auxiliary buses in Console have 32 samples of additional latency. This is necessary to maintain the lowest possible input latency.

## DAW UAD-2 DSP Latency

When UAD plug-ins are used within a DAW (not Console), I/O buffering is used to shuttle audio data back and forth between the UAD-2 inside Apollo Solo and the DAW, which induces additional latency.

UAD-2 DSP latency from UAD plug-ins within the DAW is determined by the DAW's [I/O Buffer Size](#) setting. This latency is unrelated to the (indiscernible) audio interface I/O latency — they are separate processes.

DAW UAD-2 DSP latency makes tracking through UAD plug-ins in the DAW via software monitoring problematic for the performer because an artist cannot hear their performance in realtime.

The issue of UAD-2 DSP latency when recording with Apollo Solo is eliminated by using Console for live performance input monitoring with optional Realtime UAD Processing, where buffering latency does not apply.

## Does all this latency stuff matter?

With Apollo Solo, not really. Performance input latency is not a factor because of Console's low latency hardware input monitoring, and recording (track alignment) latency during recording, overdubbing, and mixing is automatically compensated by Apollo Solo's device drivers and the DAW's automatic delay compensation engine.

# Device Drivers

The Apollo Solo device drivers are low-level system software files that instruct the computer's operating system about how to communicate with the Apollo Solo hardware. Apollo Solo's drivers control Apollo Solo's audio interface, Console, and UAD-2 functionality.

The drivers are loaded during computer system startup so that whenever Apollo Solo is connected, the device is ready to accept instructions from the OS and audio applications.

## Core Audio & ASIO

Apollo Solo's audio drivers use the Core Audio (Mac) and ASIO (Windows) [APIs](#). Apollo Solo's normal (non-DSP) audio interface features are simply seen as a Core Audio / ASIO device; therefore any Core Audio / ASIO compliant software can use Apollo Solo for audio I/O.

## UAD Mixer Engine

The Console application and Console Recall plug-in don't actually communicate directly with Apollo Solo. Instead, they communicate with the *UAD Mixer Engine*, which is the central software hub for all Console and Console Recall functionality. The UAD Mixer Engine behaves as a server for Apollo Solo's internal DSP mixer that runs in the background, so Console does not have to be open for Apollo Solo to function.

The UAD Mixer Engine is a system-level application that is automatically launched during system startup and is always running during normal operation. The UAD System Menu is its only interface, which can be accessed from the Menu Bar (Mac), or the Windows System Tray (Windows).

## Driver I/O Complement

The specific inputs and outputs that are available to the DAW depends on the active configuration. The I/O complement changes at high sample rates and when multi-unit cascading. The specific I/O complements can be customized in the I/O Matrix Panel. Default I/O values are listed in the [Driver I/O Table](#) in this chapter.

## Driver Names and Numbers

Apollo Solo's drivers describe all I/O channels by name and number, but what is actually displayed in the DAW's I/O assignment lists depends on each particular DAW. Names are not displayed by all DAWs (e.g., Ableton Live), or the driver name display mode may need to be changed in the DAW (e.g., Apple Logic Pro).

## Virtual I/O

Apollo Solo's device drivers carry various *virtual* (software only) input and output channels in addition to those directly associated with the hardware inputs and outputs. The virtual channels consist of all of Console's mix bus outputs (the main monitor mix, HP mix, and AUX mixes) and Console's virtual inputs. Virtual I/O facilitates highly flexible signal routing via the DAW. See [Virtual I/O](#) for details about this feature.

## Driver I/O Table

The table below lists the I/O channel numbers and names for all Core Audio / ASIO streams available at default [I/O Matrix Panel](#) settings.

*Tip: For convenient reference with DAWs that don't display driver I/O channels by name, print this page.*

### Custom I/O Routes

The default I/O routes can be easily changed in the I/O Matrix Panel within the Console Settings window. See the [I/O Matrix Overview](#) for related information.

### Driver I/O Table Notes

- The number at the left of both columns is the channel number used by the DAW if the channel names are not displayed by the DAW.
- At sample rates of 176.4 kHz and 192 kHz, AUX 2 and VIRTUAL channels are unavailable.

<b>Apollo Solo Default I/O Table</b>	
<b>INPUTS</b>	<b>OUTPUTS</b>
1 MIC/LINE/Hi-Z 1	1 MON L
2 MIC/LINE 2	2 MON R
3 MON L*	3 VIRTUAL 1†
4 MON R*	4 VIRTUAL 2†
5 VIRTUAL 1*	5 HP L
6 VIRTUAL 2*	6 HP R
7 AUX1 L*	
8 AUX1 R*	
9 AUX2 L*	
10 AUX2 R*	
<i>*Software Outputs (for DAW inputs)</i>	<i>†Software Outputs (for Console inputs)</i>



# Troubleshooting

If Apollo Solo isn't behaving as expected, some common troubleshooting items to confirm are below. If you are still experiencing issues after performing these checks, contact [Technical Support](#).

SYMPTOM	ITEMS TO CHECK
Unit won't power on	<ul style="list-style-type: none"> <li>• Confirm Thunderbolt 3 cable is connected to Apollo Solo</li> <li>• Confirm Apollo Solo is connected to built-in Thunderbolt 3 port on computer</li> <li>• Confirm computer is started</li> <li>• Try a different Thunderbolt 3 cable</li> <li>• Note that not all USB-C cables are Thunderbolt 3 cables</li> </ul>
Unit is not recognized by computer	<ul style="list-style-type: none"> <li>• Confirm Thunderbolt 3 cable is fully inserted at both ends</li> <li>• Confirm latest Apollo Solo software is installed (reinstall if necessary)</li> <li>• Confirm computer port is Thunderbolt 3 port (not a USB 3.1 via USB-C port)</li> <li>• Note that not all USB-C cables are Thunderbolt 3 cables</li> </ul>
No monitor output	<ul style="list-style-type: none"> <li>• Confirm connections, power, and volume of monitoring system</li> <li>• Confirm Apollo Solo monitor level is turned up</li> <li>• Confirm monitor outputs are not muted (push MUTE button when in monitor mode)</li> <li>• Confirm monitor LEDs are displaying signal activity (check signal flows)</li> </ul>
Can't hear mic or line input(s)	<ul style="list-style-type: none"> <li>• Confirm mic/line switch setting is correct for the channel</li> <li>• Confirm preamp gain is turned up for the channel(s)</li> <li>• On channel 1, confirm nothing is plugged into the Hi-Z input</li> </ul>
Can't hear mic input(s)	<ul style="list-style-type: none"> <li>• Confirm +48V phantom power is enabled if required by microphone</li> </ul>
Can't hear Hi-Z input	<ul style="list-style-type: none"> <li>• Confirm volume on connected device is turned up</li> <li>• Confirm Hi-Z input cable is 1/4" TS (TRS cables cannot be used with Hi-Z input)</li> </ul>
Preamp controls have no effect on channel	<ul style="list-style-type: none"> <li>• Confirm desired channel is selected for control (push PREAMP button to select channel when in PREAMP mode)</li> </ul>
Audio glitches and/or dropouts during DAW playback	<ul style="list-style-type: none"> <li>• Increase hardware I/O buffer size value in DAW (Mac) or Console (Windows)</li> </ul>
Undesirable echo/phasing	<ul style="list-style-type: none"> <li>• Confirm input monitoring is not enabled in both Console and DAW</li> </ul>
Static and/or white noise is heard when nothing is plugged in	<ul style="list-style-type: none"> <li>• Mute or lower preamp gain to minimum on unused preamp channels (mic preamps can emit noise even when nothing is plugged in)</li> <li>• Some UAD plug-ins model the noise characteristics of the original equipment (defeat the noise model in the UAD plug-in interface, or mute the channel containing the plug-in to temporarily mute the noise)</li> </ul>
Various LEDs inside the unit are blinking	<ul style="list-style-type: none"> <li>• This is normal operational behavior and can be safely ignored</li> </ul>
Acoustic clicking heard within hardware unit when powering on and/or changing settings	<ul style="list-style-type: none"> <li>• This is normal operational behavior and can be safely ignored; mechanical relays are temporarily muting the outputs</li> </ul>
Apollo Solo is behaving unexpectedly	<ul style="list-style-type: none"> <li>• As a last resort, perform a hardware reset on the unit by following these steps:               <ol style="list-style-type: none"> <li>1. Disconnect the Thunderbolt 3 cable from Apollo Solo</li> <li>2. Press and hold the main LEVEL knob, FILTER button, and POLARITY button</li> <li>3. Connect the Thunderbolt 3 cable while continuing to press these controls</li> <li>4. After all front panel LEDs ash rapidly for several seconds, release the controls</li> </ol>               Note: The computer must be on while performing this procedure. Alternately, when computer is shut down (powered off), hold the switches while starting the computer.             </li> </ul>

# Glossary

**A/D** An acronym for “Analog to Digital,” which refers to the conversion of analog signals to digital data.

**Acronym** A word formed from the first letters of other words (e.g., GUI, ADAT, TRS, etc.).

**ADAT** An acronym for “Alesis Digital Audio Tape.” ADAT was the name given to the Alesis-branded products of the 1990s which recorded eight tracks of digital audio on a standard S-VHS video cassette. The term now generally refers to the 8-channel optical “Lightpipe” connection that is used in a wide range of digital products from many manufacturers.

**AES** (sometimes written as “AES/EBU”) The name of a digital audio transfer standard jointly developed by the American-based Audio Engineering Society and the European Broadcast Union. Designed to carry two channels of 16-, 20- or, 24-bit digital audio at sampling rates of up to 192kHz, the most common AES physical interconnect utilizes a 3-conductor 110 ohm twisted pair cable, terminating at standard XLR connectors. (See “Dual Wire” and “Single Wire”)

**Analog** Literally, an analog is a replica or representation of something. In audio signals, changes in voltage are used to represent changes in acoustic sound pressure. Note that analog audio is a continuous representation, as opposed to the quantized, or discrete “stepped” representation created by digital devices. (See “Digital”)

**API** Acronym for Application Programming Interface. A software layer between an operating system and third-party hardware (such as an audio interface) and/or software (such as a DAW). For example, a computer OS’s audio API enables audio hardware and audio software from different vendors to communicate with the OS and each other.

**Apollo** Universal Audio’s line of high-resolution audio interface products featuring low-latency monitoring of hardware inputs with Realtime UAD Processing.

**Apollo Expanded** Universal Audio’s name for connecting more than one Apollo device together via Thunderbolt in a multi-unit cascading setup for increased I/O.

**Arrow** Universal Audio’s entry-level audio interface featuring Realtime UAD Processing.

**ASIO** Acronym for Audio Stream Input/Output. ASIO is an audio interface driver protocol for Windows operating systems developed by Steinberg GmbH.

**Balanced** Audio cabling that uses two twisted conductors enclosed in a single shield, thus allowing relatively long cable runs with minimal signal loss and reduced induced noise such as hum.

**Bit** A contraction of the words “binary” and “digit,” a bit is a number used in a digital system, and it can have only one of two values: 0 or 1. The number of bits in each sample determines the theoretical maximum dynamic range of the audio data, regardless of sample rate being used. Each additional bit adds approximately 6 dB to the dynamic range of the audio. In addition, the use of more bits helps capture quieter signal more accurately. (See “Sample” and “Dynamic range”)

**Bit Depth** (See “Bit Resolution”)

**Bit Resolution** Often used interchangeably with “bit depth,” this is a term used to describe the number of bits used in a digital recording. Apollo converts analog audio and transmits digital audio with a resolution of 24 bits (thus yielding a theoretical dynamic range of approximately 145 dB), the highest audio interface resolution in common use today. (See “Dynamic Range”)

**BNC** A bayonet-type coaxial connector often found on video and digital audio equipment, as well as on test devices like oscilloscopes. In digital audio equipment, BNC connectors are normally used to carry word clock signals between devices. BNC connectors are named for their type (Bayonet), and their inventors, Paul Neil and Carl Concelman. (See “Word Clock”)

**Buffer, buffers, buffering** The transference of data in small batches instead of continuously. Buffering induces latency (delay) and is inherent in most digital audio systems.

**Bus** A signal path that carries more than one signal, e.g., a mix bus, auxiliary bus, headphone cue bus, etc.

**Channel Input Strip** A group of controls that pertain only to the functions contained within a particular mixer input channel. In most mixing consoles, the “strips” are duplicated for each input.

**Class A** One design technique used in electronic devices such that their active components are drawing current and working throughout the full signal cycle, thus yielding a more linear response. This increased linearity results in fewer harmonics generated, hence lower distortion in the output signal.

**Condenser Microphone** A microphone design that utilizes an electrically charged thin conductive diaphragm stretched close to a metal disk called a backplate. Incoming sound pressure causes the diaphragm to vibrate, in turn causing the capacitance to vary in a like manner, which causes a variance in its output voltage. Condenser microphones tend to have excellent transient response but require an external voltage source, most often in the form of 48 volts of “phantom power.”

**Clock** In digital audio or video, a clock serves as a timing reference for a system. Every digital device must carry out specified numbers of operations per period of time and at a consistent speed in order for the device to work properly. Digital audio devices such as Apollo normally have an internal clock, and are also capable of locking to external clock routed from other digital devices. In order to avoid signal degradation or undesirable audible artifacts, it is absolutely critical that all digital devices that are interconnected in a system be locked to the same clock.

**Clock Distribution** Refers to the process of routing a master clock signal (either from an internal clock or an external source) to multiple devices by means of multiple outputs, thus removing the need to cascade the clock through external devices, which can degrade the signal.

**Core Audio** The audio [API](#) for macOS.

**D/A** Acronym for “Digital to Analog,” which refers to the conversion of a digital data to an analog signal.

**DAW** Acronym for “Digital Audio Workstation” – that is, any device or software that can record, play back, edit, and process digital audio.

**dB** Abbreviation for “decibel,” a logarithmic unit of measure used to determine, among other things, power ratios, voltage gain, and sound pressure levels.

**dBm** Abbreviation for “decibels as referenced to milliwatt,” dissipated in a standard load of 600 ohms. 1 dBm into 600 ohms results in 0.775 volts RMS.

**dBV** Abbreviation for “decibels as referenced to voltage,” without regard for impedance; thus, one volt equals one dBV.

**DI** Acronym for “Direct Inject” or “Direct Input,” a recording technique whereby the signal from a high-impedance instrument such as electric guitar or bass is routed to an input. DI into mixer or tape recorder inputs often employ use of a “DI box,” which raises the signal to the correct voltage level at the right impedance.

**Digital** Information or data that is stored or communicated as a series of bits (binary digits, with values of 0 or 1). Digital audio refers to the representation of varying sound pressure levels by means of a series of numbers. (See “Analog” and “Bit”)

**Dither** Minute amounts of shaped noise added intentionally to a digital recording in order to reduce a form of distortion known as “quantization noise” and aid in low level sound resolution.

**Dry** Refers to a signal that is unprocessed, e.g., recording a dry signal. The antonym of a “wet” signal.

**DSP** Acronym for “Digital Signal Processing” (or “Digital Signal Processor.”)

**DSP Accelerator** A device dedicated to digital signal processing. UAD-2 devices are DSP accelerators.

**Dynamic Microphone** A type of microphone that generates signal with the use of a very thin, light diaphragm which moves in response to sound pressure. That motion in turn causes a voice coil which is suspended in a magnetic field to move, generating a small electric current. Dynamic mics are generally less expensive than condenser or ribbon mics and do not require external power to operate.

**Dynamic Range** The difference between the loudest sections of a piece of music and the softest ones. The dynamic range of human hearing (that is, the difference between the very softest passages we can discern and the very loudest ones we can tolerate) is considered to be approximately 120 dB. (See “Bit resolution”)

**EQ** Abbreviation for “Equalization,” a circuit that allows selected frequency areas in an audio signal to be attenuated or boosted.

**External Clock** A clock signal derived from an external source. (See “Clock”)

**FET** Acronym for “Field Effect Transistor.” A type of transistor that relies on an electric field to control the shape, and hence the conductivity, of a “channel” in a semiconductor material.

**Firmware** Software that is embedded in hardware.

**Flex Routing** Apollo technology that enables its physical inputs to be routed to various physical outputs. Compare to Virtual I/O.

**FPGA** Acronym for “Field Programmable Gate Array.” A type of integrated circuit that can be programmed after manufacturing (“in the field”) to perform specialized functions.

**Front End** Refers to a device that provides analog and digital input/output (I/O) to a digital audio workstation (DAW). Apollo is a front end.

**Graphical User Interface** A software window, panel, or screen containing controls where parameters are adjusted by the user. (See “GUI”)

**GUI** Acronym for Graphical User Interface.

**Hi-Z** Abbreviation for “High Impedance.” Apollo’s Hi-Z input allows direct connection of an instrument such as electric guitar or bass via a standard unbalanced ¼” jack.

**High Resolution** In digital audio, refers to 24-bit signals at sampling rates of 88.2 kHz or higher.

**Hz** Abbreviation for “Hertz,” a unit of measurement describing a single analog audio cycle (or digital sample) per second.

**Impedance** A description of a circuit’s resistance to a signal, as measured in ohms, thousands of ohms (Kilohms), or millions of ohms (megohms).

**Internal Clock** A clock signal derived from onboard circuitry. (See “Clock”)

**I/O** Acronym for “input/output.”

**I/O Matrix** Apollo technology that enables customized I/O mapping at the Core Audio / ASIO driver level.

**kHz** Abbreviation for “kiloHertz” (a thousand Hertz), a unit of measurement describing a thousand analog audio cycles (or digital samples) per second. (See “Hz”)

**JFET** Acronym for Junction Field Effect Transistor, a specific type of FET which has some similarities to traditional bipolar transistor designs that can make it more appropriate for use in some audio circuit designs. (See “FET”)

**Jitter** Refers to short-term variations in the edges of a clock signal, caused by a bad source clock, inferior cabling or improper cable termination, and/or signal-induced noise. A jittery signal will contain spurious tones at random, inharmonic frequencies. Usually, the jitter will be worse with higher signal frequencies. The internal digital clock of Apollo was designed for extreme stability and jitter-free operation, and its onboard phase aligned clock conditioner circuitry removes jitter from external sources, so conversion quality is unaffected by clock source.

**Lightpipe** A digital connection made with optical cable. This was a phrase coined by Alesis to make a distinction between the proprietary 8-channel optical network used in their ADAT products and standard stereo optical connectors used on CD players and other consumer products.

**Line Level** Refers to the voltages used by audio devices such as mixers, signal processors, tape recorders, and DAWs. Professional audio systems typically utilize line level signals of +4 dBm (which translates to 1.23 volts), while consumer and semiprofessional audio equipment typically utilize line level signals of -10 dBV (which translates to 0.316 volts).

**Low Cut Filter** An equalizer circuit that cuts signal below a particular frequency. Same as “high pass filter.”

**Mic Level** Refers to the very low level signal output from microphones, typically around 2 millivolts (2 thousandths of a volt).

**Mic Preamp** The output level of microphones is very low and therefore requires specially designed mic preamplifiers to raise (amplify) their level to that needed by a mixing console, tape recorder, or digital audio workstation (DAW).

**Mute** “Turn off the signal.” Mute stops the signal from being routed.

**Native** Refers to computer-based digital audio recording software controlled by the computer’s onboard processor, as opposed to software that requires external hardware to run.

**OS** Acronym for Operating System. The OS is the software used to control the computer hardware, such as OS X (Mac) and Windows 10 (PC).

**Pan** Abbreviation for “Panorama” or “Panoramic.” A pan control determines a monophonic signal’s positioning in the stereo field.

**Patch Bay** A passive, central routing station for audio signals. In most recording studios, the line-level inputs and outputs of all devices are connected to a patch bay, making it an easy matter to re-route signal with the use of patch cords.

**Patch Cord** A short audio cable with connectors on each end, typically used to interconnect components wired to a patch bay.

**PDF** Acronym for “Portable Document Format.” PDF is the standardized file format used for distribution of documentation in electronic form. Various applications can open PDF files; one such “reader” application is available for free at [www.adobe.com](http://www.adobe.com).

**Plug-In** Software components that are added to host software applications to enhance their functionality and/or performance.

**Powered Plug-Ins** High-quality audio processing plug-ins, developed and sold by Universal Audio, that run exclusively on UAD DSP accelerator products.

**Quantization Noise** A form of digital distortion caused by mathematical rounding-off errors in the analog to digital conversion process. Quantization noise can be reduced dramatically by dithering the digital signal. (See “Dither”)

**Realtime UAD Processing** Universal Audio’s DSP + FPGA technology that enables UAD Powered Plug-Ins to run with latencies in the sub-2ms range on input with UA’s Arrow and Apollo line of audio interface models. Realtime UAD processing provides the ultimate sonic experience while monitoring and/or tracking. Realtime UAD processing is a special function that is available only within the Apollo/Arrow Console application.

**Ribbon Microphone** A type of microphone that works by loosely suspending a small element (usually a corrugated strip of metal) in a strong magnetic field. This “ribbon” is moved by the motion of air molecules and in doing so it cuts across the magnetic lines of flux, causing an electrical signal to be generated. Ribbon microphones tend to be delicate and somewhat expensive, but often have very flat frequency response.

**Sample** A digital “snapshot” of the amplitude of a sound at a single instant in time. The number of samples taken per second is determined by the device’s sample rate. (See “Sample rate”)

**Sample Rate** The number of samples per second. In digital audio, there are six commonly used sample rates: 44.1 kHz (used by audio CDs), 48 kHz, 88.2 kHz (2 x 44.1 kHz), 96 kHz (2 x 48 kHz, used by DVDs), 176.4 kHz (4 x 44.1 kHz), and 192 kHz (4 x 48 kHz). The higher the sample rate, the greater the frequency response of the resulting signal; however, higher sample rates require more storage space. (See “kHz”)

**Sample Rate Conversion** The process of altering a digital signal’s sample rate to a different sample rate.

**S/MUX** (sometimes written as “S-MUX”) Abbreviation for Sample Multiplexing. S/MUX is a method for transmitting two channels of high sample rate (88.2, 96, 176.4, or 192 kHz) 24-bit digital audio over a legacy optical “lightpipe” ADAT connection, which was originally designed to carry eight channels of 16-, 20- or 24-bit audio at 44.1 kHz or 48 kHz sampling rate. (See “ADAT” and “Lightpipe”)

**SPDIF** (sometimes written as “S/PDIF”) An acronym for “Sony/Philips Digital Interface Format,” a digital audio transfer standard largely based on the AES/EBU standard. Designed to carry two channels of 16-, 20- or, 24-bit digital audio at sampling rates of up to 192 kHz, the most common SPDIF physical interconnect utilizes unbalanced, 75 ohm video-type coaxial cables terminating at phono (RCA-type) connectors. (See “AES”)

**Superclock** A proprietary format used by some early Pro Tools systems to distribute clock signal running at 256x the system’s sample rate, thus matching the internal timing resolution of the software. (See “Clock” and “Pro Tools”)

**Transcoding** Converting one type of digital signal to another (i.e, from AES to SPDIF, or from ADAT to AES).

**Transformer** An electronic component consisting of two or more coils of wire wound on a common core of magnetically permeable material. Audio transformers operate on audible signal and are designed to step voltages up and down and to send signal between microphones and line-level devices such as mixing consoles, recorders, and DAWs.

**Transient** A relatively high volume pitchless sound impulse of extremely brief duration, such as a pop. Consonants in singing and speech, and the attacks of musical instruments (particularly percussive instruments), are examples of transients.

**Transimpedance Preamp** A transformerless solid-state preamplifier utilizing a transistor configuration that employs current feedback for ultra-low distortion and the highest possible quality of signal from input to output. The transimpedance design allows audio from 4 Hz to 150 kHz to pass through without altering the phase relationships between fundamental frequencies and overtones. Noise and distortion are kept to near-theoretical minimums so critical signals may be generously amplified without degrading the quality or character of the sound source.

**TRS** Acronym for Tip-Ring-Sleeve. A ¼” phone connector with three conductors, typically used for balanced signal connections (e.g., I/O) or carrying two unbalanced signals (e.g., headphones).

**TS** Acronym for Tip-Sleeve. A ¼” phone connector with two conductors, typically used for unbalanced signal connections. Note that TS, like TRS and XLR, denotes the connector only and does not necessarily indicate the signal level of the connection. TS/TRS/XLR cables are used for both low-level (e.g., microphones and instruments) and line-level connections.

**UAD** Acronym for “Universal Audio Digital.” Used in reference to digital products created by Universal Audio.

**UAD-2** A line of DSP accelerator products developed and manufactured by Universal Audio.

**Unison** Universal Audio’s exclusive preamp hardware/software integration technology that enables UAD preamp plug-ins reconfigure the physical input impedance, gain staging response, and other parameters of Apollo’s mic preamp hardware to match the emulated preamp’s hardware design characteristics with bi-directional hardware and software control.

**Virtual I/O** Apollo audio inputs and outputs that exist in software but not in hardware. Virtual I/O is used to route digital audio channels between Console and other audio applications.

**Wet** Refers to a signal that is processed, e.g., recording a wet signal. The antonym of a “dry” signal.

**Word Clock** A dedicated clock signal based on the transmitting device’s sample rate or the speed with which sample words are sent over a digital connection. (See “Clock”)

**XLR** A standard three-pin connector used by many audio devices, with pin 1 typically connected to the shield of the cabling, thus providing ground. Pins 2 and 3 are used to carry audio signal, normally in a balanced (out of phase) configuration.



# Specifications

All specifications are typical performance unless otherwise noted, tested under the following conditions: 48 kHz internal sample rate, 24-bit sample depth, 20 kHz measurement bandwidth, with balanced inputs and outputs.

<b>SYSTEM</b>	
<b><i>I/O Complement</i></b>	
Microphone Inputs	Two
Analog Line Inputs	Two
Hi-Z Instrument Inputs	One
Analog Monitor Outputs	Two (one stereo pair)
Headphone Outputs	One stereo
Thunderbolt 3 Port	One
<b><i>A/D – D/A Conversion</i></b>	
Supported Sample Rates (kHz)	44.1, 48, 88.2, 96, 176.4, 192
Bit Depth Per Sample	24
Simultaneous A/D conversion	Two channels
Simultaneous D/A conversion	Four channels
Analog Round-Trip Latency	1.1 milliseconds @ 96 kHz sample rate
Analog Round-Trip Latency with up to five serial UAD Powered Plug-Ins via Console application	1.1 milliseconds @ 96 kHz sample rate

*(continued)*

<b>ANALOG I/O</b>	
Frequency Response	20 Hz – 20 kHz, ±0.1 dB
<b>Line Inputs 1 &amp; 2</b>	
Connector Type	¼" Female TRS Balanced (Combo XLR/TRS)
Dynamic Range	118 dB (A-weighting)
Total Harmonic Distortion + Noise	–107 dBFS
Input Impedance	10K Ohms (differential)
Gain Range	+10 dB to +65 dB
Maximum Input Level (600 Ohm source)	+20.7 dBu
<b>Microphone Inputs 1 &amp; 2</b>	
Connector Type	XLR Female, pin 2 positive (Combo XLR/TRS)
Phantom Power	+48V (switchable per mic input)
Dynamic Range	118 dB (A-weighting)
Total Harmonic Distortion + Noise	–108 dBFS
Default Input Impedance	5.5K Ohms (variable via Unison plug-ins)
Gain Range	+10 dB to +65 dB
Pad Attenuation (switchable per input)	20 dB (variable via Unison plug-ins)
Maximum Input Level	+25.2 dBu (minimum gain, pad engaged)
<b>Hi-Z Instrument Input</b>	
Connector Type	Female ¼" TS Unbalanced
Dynamic Range	118 dB (A-weighting)
Total Harmonic Distortion + Noise	–105 dBFS
Input Impedance (variable via Unison plug-ins)	1M Ohms
Gain Range	+10 dB to +65 dB
Maximum Input Level (@ minimum gain)	+12.5 dBu
<b>Outputs 1 &amp; 2</b>	
Connector Type	¼" Female TRS Balanced
Output Impedance	100 Ohms (differential)
Dynamic Range	115 dB (A-weighting)
Total Harmonic Distortion + Noise	–106 dBFS
Maximum Output Level	+20.7 dBu
Operating Reference Level	+14 dBu, +20 dBu (selectable)

*(continued)*

**ANALOG I/O*****Stereo Headphones Output***

Connector Type	¼" Female TRS Stereo
Dynamic Range (A-weighting)	115 dB (600 Ohm load) 114 dB (32 Ohm load)
Total Harmonic Distortion + Noise (A-weighting)	-97 dB (600 Ohm load) -88 dB (32 Ohm load)
Maximum Output Power	62 mW (300 Ohm load) 240 mW (32 Ohm load)

**ELECTRICAL**

Power Supply	None (Bus powered via Thunderbolt 3)
Maximum Power Consumption	10 Watts

**ENVIRONMENTAL**

Operating Temperature Range	32° to 95° Fahrenheit (0° to 35° Celsius)
Storage Temperature Range	-40° to 176° Fahrenheit (-40° to 80° Celsius)
Operating Humidity Range	20% to 80%

**MECHANICAL*****Dimensions***

Width	7.1" (179.9 mm)
Height (front)	1.0" (25.2 mm)
Height (rear)	1.8" (46.7 mm)
Depth	4.8" (121.1 mm)
Shipping Box (Length x Width x Height)	8.5 x 6.4 x 2.63 (inches), 216 x 162 x 68 (mm)

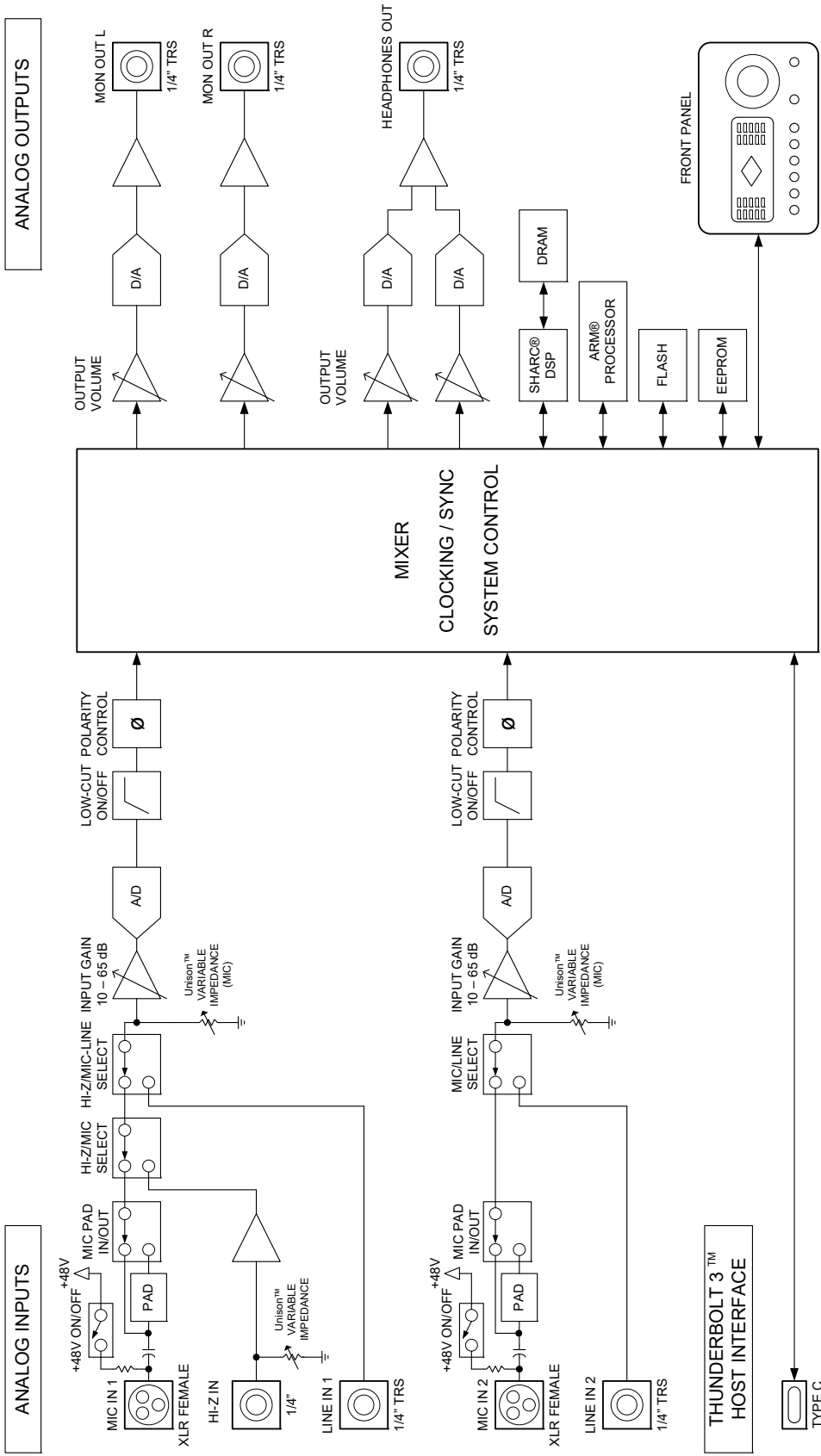
***Weight***

Weight (bare unit)	1.38 lbs (0.63 Kg)
Shipping Weight (with box)	4 lbs (1.8 Kg)

***Package Contents***

Apollo Solo Thunderbolt 3 Bus Powered Audio Interface
Getting Started URL Card

# Hardware Block Diagram



Apollo Solo Hardware Block Diagram

# Universal Audio History



## Pioneering audio recording for more than 50 years.

Founded in 1958 by Bill Putnam Sr., Universal Audio has been synonymous with innovative recording products since its inception. A favorite engineer of Frank Sinatra, Nat King Cole, Ray Charles and more, the late Bill Putnam Sr. was a passionate innovator who is widely regarded as the father of modern recording — with many of his legendary studio and equipment designs still in use today.

Specifically, Putnam was the inventor of the modern recording console, the multi-band audio equalizer, and the vocal booth, and he was the first engineer to use artificial reverberation in commercial recording. Alongside his friend Les Paul, Putnam was also involved in the early development of stereophonic recording.

Putnam, a natural entrepreneur, started three audio product companies during his long career: Universal Audio, Studio Electronics, and UREI. All three companies built equipment that remains widely used decades after their introduction, including the ubiquitous LA-2A and 1176 compressors, and the 610 tube recording console. The 610 console in particular stands as one of the most beloved designs in audio history, used to record everyone from Sinatra to the Beach Boys to Van Halen's eponymous debut.



## Re-founded in 1999

Universal Audio was re-founded in 1999 by Bill's sons, James Putnam and Bill Putnam Jr., with two main goals: to faithfully reproduce classic analog recording equipment in the tradition of their father; and to design new digital recording tools in with the sound and spirit of vintage analog technology. To that end, Universal Audio employs the world's brightest DSP engineers and digital modeling authorities to develop our award-winning UAD Powered Plug-Ins platform. Featuring the most authentic analog emulation plug-ins in the industry, our DSP gurus work with the original hardware manufacturers — using their exact schematics, golden units, and experienced ears — to give UAD plug-ins warmth and harmonics in all the right places, just like analog.

Nothing better represents the merging of our analog heritage and groundbreaking digital designs than the award-winning Apollo audio interface. Introduced in 2012, Apollo has become the new worldwide standard for professional music production, and has been used to record breakthrough albums by artists such as Kendrick Lamar, Coldplay, Dr. Dre, Brad Paisley, and many more.

With 165 employees and offices in Los Angeles, Colorado, and Amsterdam, Universal Audio is headquartered near Silicon Valley in Scotts Valley, California — where our classic analog gear is still hand-built, one unit at a time.

Software or hardware, every Universal Audio product is backed by a decades long legacy of innovation, superlative quality, and technical passion.



## Bill Putnam Sr.

The name M.T. “Bill” Putnam retains a unique status in the audio industry hall of fame- it’s legendary even among those who are considered to be legends themselves. Called the “father of modern recording” by no less a luminary than Bruce Swedien, and a “visionary, responsible for motivating new thinking,” by respected studio engineer Tom Hidley, Putnam was a true renaissance man in the world of sound and music.



As a record producer, engineer, inventor, writer, singer, technician, studio owner and businessman, he excelled at combining his talents in a creative way. A pioneer in recording studio acoustics, Putnam is acknowledged to be the first person to use artificial reverberation for commercial recordings. He also developed the first multi-band equalizers, and with his company Universal Audio, was responsible for the development of classic equipment like the 1176LN and UREI® Time Align monitors. He was involved in the early development of stereophonic recording, and founded studios in Chicago, Hollywood and San Francisco whose legacy still lives on today.

**Early Interests** Born in 1920 in Danville, Illinois, he was influenced by his father, a businessman who also put on radio programs, including a number one country music show. Young Putnam’s interests surfaced early; in Boy Scouts he earned a merit badge in wireless, building a crystal set and a one-tube radio. By 15 he was taking the ham radio operator’s exam and constructing his own equipment. In high school both his artistic and technical sides emerged full on. He worked repairing radios and renting out P.A. systems, while also singing on weekends with dance bands (for five dollars a night, which included the P.A. rental!), developing his interest in the music business, and realizing, as he has said, that “musicians were my favorite people.”

**Universal Recording Corp.** Opens in Chicago Technical college followed, then work at radio stations, and radio engineering work for the Army during World War II. In 1946 Putnam started his own recording studio, Universal Recording Corp., in Evanston Illinois. His goals at the time, besides having a successful business, were the development of new recording techniques and specialized equipment for recording studios.

To that end the manufacturing company Universal Audio, which later became UREI®, was formed. Most of the equipment, including the console, for Universal Recording was built by Universal Audio. It wasn’t long before the company relocated to Chicago, and it was there, in 1947, that Putnam recorded what is generally accepted to be the first “pop” record to use artificial reverberation. The founder of the group The Harmonicats, Jerry Murad, wanted to record using an echo chamber like he’d heard on effects in spooky radio mysteries. Putnam not only financed the record for a piece of the profits, he came up with the idea of using the tiled men’s room at Universal Recording to create that echo. The Harmonicats song “Peg-O-My-Heart,” became the first million seller smash with more than 1,400,000 copies sold, and the rest was, well, history.

Landmark Recordings Bruce Swedien, a teenager at the time, recalls that the sound on “Peg-O-My-Heart” was a seminal influence on him. “It was the first pop music recording where artificially controlled reverb was used for artistic effect,” he explains. “Many of the recordings that were done prior to that had reverb, but it was part of the acoustics of the recording environment. Bill’s contribution to the art was that he literally came up with the design of the way the echo or reverb sound is sent from the recording desk and the way it’s returned to the mix so that it can be used in a variable amount.

“I was a youngster in Minneapolis in the early 50s when I first heard “Peg-O-My-Heart,” Swedien continues, “And I can remember it like it was yesterday. It had an extraordinary effect on me. I didn’t understand how the techniques were done, but I knew it had tremendous artistic impact.”

Putnam’s engineering credits grew quickly; at that time he worked with artists such as Patti Page, Vic Damone and Dinah Washington, and had a million selling record on his own Universal Records label with “Jealous Heart” by Al Morgan. A number of firsts occurred at Universal: the first use of tape repeat, the first vocal booth, the first multiple voice recording, the first 8-track recording trials and experiments with half speed disc mastering.

Universal was becoming famous, doing recordings for the Chicago based labels VeeJay, Mercury and Chess. It was a hub for rhythm and blues recordings including cuts for Muddy Waters, Willie Dixon, Bo Diddley, Little Walter, and Chuck Berry. Jazz artists recorded by Putnam included Stan Kenton, Tommy Dorsey, Count Basie, Dizzy Gillespie, Ella Fitzgerald, Sarah Vaughn, Nat King Cole, and the master, Duke Ellington. Putnam was also producing records for Decca, as well as writing songs and lyrics.



With all this success, Universal Recording went through several incarnations, with the dream version completed in 1955. At that time it was the most advanced and largest independent recording facility in the country attracting top producers like Nelson Riddle, Mitch Miller and Quincy Jones. It was also at that time that Bruce Swedien went to work for the studio.

“It’s absolutely true,” he states. “Bill Putnam was the father of recording as we know it today. The processes and designs which we take for granted -- the design of modern recording desks, the way components are laid out and the way they function, console design, cue sends, echo returns, multitrack switching -- they all originated in Bill’s imagination.”

Murray Allen, who purchased Chicago’s Universal Recording from Putnam in 1972 elaborates. “Bill was a brilliant person, highly talented, with a great set of ears,” he says. “He was Duke Ellington’s favorite engineer, among many, and at one time he had more singles in the top 40 than anybody else. At the time, if you needed something in sound, he was the guy. He designed systems for the Sands and other big showrooms in Las Vegas; John Kennedy flew him out to arrange the sound for the broadcast of his inauguration. He did it all.”



Moving West- United Recording Corp. With his Chicago studio so successful, Putnam's clients began urging him to open a facility on the West Coast, and finally he was convinced. In 1957 he sold his interest in Universal Recording, started a new company called United Recording Corp. and moved to Hollywood, taking over a building at 6050 Sunset and starting construction on new studios. Stereo was taking off, and Putnam was determined to incorporate as many technological innovations into the complex as possible.

In 1958, Studio B was completed along with two reverb chambers. The facility soon grew to three studios, a mixdown room, three mastering rooms including one with stereo, and a small manufacturing plant, all in 15,000 square feet. The studios were busy around the clock, with projects from Ricky Nelson to voice-overs for Hanna Barbera cartoons like the Flintstones.

In the early 60s Western Recorders, one block away at 6000 Sunset, was acquired and remodeled. The studio was renamed United Western, and business continued to grow. The talent behind and in front of the glass in those days reads like a who's who of classic recording: Bones Howe, Wally Heider and Lee Hirschberg were on staff.

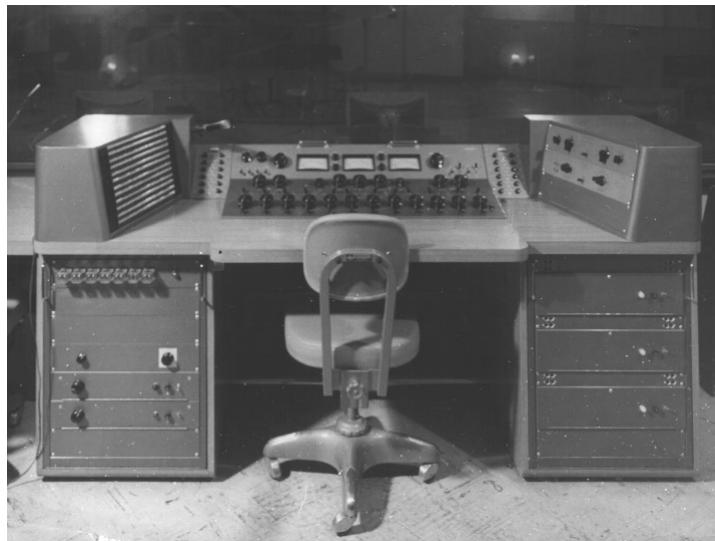


During the 60s and 70s the studios were jumping 24 hours a day, seven days a week with artists like Frank Sinatra, Bing Crosby, Dean Martin, Sammy Davis, Nat King Cole, Johnny Mercer and Ray Charles. Charles classic "I Can't Stop Loving You" was recorded there, as well as Sinatra's "It Was A Very Good Year," and The Mamas and The Papas' "California Dreamin.'" The United Western studios, still in existence today as both Cello Studios and Allen Sides' Ocean Way Recording, are still considered to be some of the best sounding rooms ever built.



Universal Audio and UREI Meanwhile, upstairs in the 6050 Sunset building Universal Audio was thriving, and changing names. Now called UREI®, the company had acquired the patent rights to the LA-2A leveling amplifier, and also to National Intertel, which became the Teletronix division of UREI®. It was a unique situation; Putnam was always searching for better ways to do things and the combination of studios and manufacturing led readily to new product ideas. Out of this synergy came the 1176LN leveling amplifier, the 1108 FET preamp and, in conjunction with Ed Long, the 813 family of speakers.

Mentor and Innovator Allen Sides, currently owner of Ocean Way Recording, whose studios today encompass almost unchanged what was part of United Western, calls Putnam “my best friend.” “When Bill started designing control rooms they were about eight feet by six feet and they were calling them booths,” he says. “He built the first of what we now call conventional control rooms, with speakers above the windows. The whole control room concept we think of today was Bill’s. The first console that had equalizers in every channel was Bill’s, the feedback equalizer was Bill’s creation, he built all his own limiters, his own consoles, he could tune his own pianos; he basically did the whole deal.



“Around 1962 he was doing half speed cutting, to get the high frequencies on the discs,” recalls Sides. “He’d designed his own mastering systems, because you couldn’t do it any other way. He was recording on custom made 30 IPS machines and he was doing all the super hi fi stuff, like the Mercury Living Presence series.”

Sides, who is renowned for both his golden ears and his abilities in the ‘art of the deal,’ appreciated Putnam on many levels. “He was an exceptional businessman, with a tremendous understanding of things,” he says. “If I had a complex deal and I couldn’t quite figure out how to approach it, I’d sit down with Bill and he’d reason it out in the most amazing way.

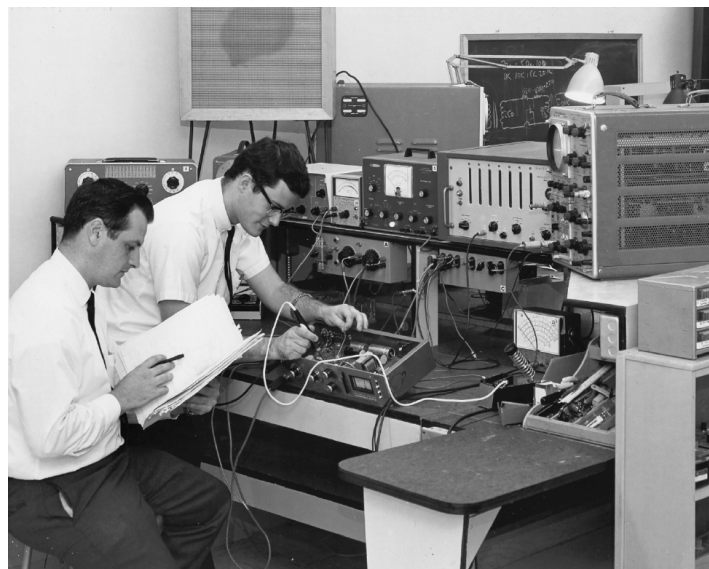
“There’s a great story about when stereo was coming on. The record companies really weren’t that interested -- everyone was cost conscious. They didn’t want to spend any more money and they were saying that stereo was a waste of time. But Bill could see the potential, and around 1959 he started recording everything with feeds to two control rooms, one for a stereo mix, one for a mono mix. In late ‘58, ‘59 and ‘60 everything Bill did was recorded in both stereo and mono.

“When stereo hit big around ‘61, none of the record companies had any catalog. But Bill did -- he had two and one half years worth. It was a lot of material -- understand at that period of time he was doing about \$200,000 a month in the United Western Complex -- which is like a million dollars a month now.

“So the record companies came to Bill and said, ‘We’ll pay you for the tape.’ And he said, ‘No, you can’t pay for the tape, but if you repay me all the studio time that was used in the last two and a half years you have a deal.’ And they did. They wrote him a check for the whole thing.”

It’s recollections like these that bring home Putnam’s visionary and entrepreneurial style. An undisputed leader in music recording and in recording technology, with innumerable accolades to his credit, it’s his son, Bill Putnam, who perhaps sums it up best, in a way Bill Sr. himself might like. Bill Jr. says, simply, “He was a guy who built equipment to solve problems in the studio.”

“There’s a whole school of what I’d call Bill Putnam engineers out there,” concludes Murray Allen. “People like Allen Sides and Bruce Swedien who worked with him and who really understood what recording sound should be about. They’ve carried on his tradition, and I think we all agree that it’s very important for people to know what he contributed.”



## Classic Compressors

The LA-2A and 1176 compressor/limiters long ago achieved classic status. They're a given in almost any studio in the world -- relied upon daily by engineers whose styles range from rock to rap, classical to country and everything in between. With so many newer products on the market to choose from, it's worth looking at the reasons why these classics remain a necessary part of any professional studio's outboard equipment collection.

The basic concept of a compressor/limiter, is of course, relatively simple. It's a device in which the gain of a circuit is automatically adjusted using a predetermined ratio that acts in response to the input signal level. A compressor/limiter "rides gain" like a recording engineer does by hand with the fader of a console: it keeps the volume up during softer sections and brings it down when the signal gets louder. The dynamic processing that occurs at ratios below 10 or 12 to one is generally referred to as compression; above that it's known as limiting.

Modern day compressors offer a great degree of programmability and flexibility - older devices such as the 1176 and the LA-2A are more straightforward in their design. Perhaps it is this fact that has contributed to their appealing sound and the longevity of their popularity.

### LA-2A

The LA-2A leveling amplifier, a tube unit with hand wired components and three simple controls, was introduced in the mid-1960s. It utilized a system of electro-luminescent optical gain control that was quite revolutionary. Gain reduction was controlled by applying the audio voltage to a luminescent driver amplifier, with a second matched photoconductive cell used to control the metering section.



With its 0 to 40 dB of gain limiting, a balanced stereo interconnection, flat frequency response of 0.1 dB from 30-15,000 Hz and a low noise level (better than 70 dB below plus 10 dBm output), the LA-2A quickly became a studio standard. Originally patented by Jim Lawrence, it was produced by Teletronix in Pasadena, California, which became a division of Babcock Electronics Corporation in 1965. In 1967 Babcock's broadcast division was acquired by the legendary Bill Putnam's company, Studio Electronics Corporation shortly before he changed the company's name to UREI®. Three different versions of the LA-2A were produced under the auspices of these different companies before production was discontinued around 1969.

## 1176LN

It was Bill Putnam himself who, in 1966, was responsible for the initial design of the 1176. Its circuit was rooted in the 1108 preamplifier which was also designed by Putnam. As is evident from entries and schematics in his design notebook, he experimented with the recently developed Field Effect Transistor (F.E.T.) in various configurations to control the gain reduction in the circuit. He began using F.E.T.s as voltage variable resistors, in which the resistance between the drain and the source terminals is controlled by a voltage applied to the gate. His greatest challenge was to ensure that distortion was minimized by operating the F.E.T.s within a linear region of operation.



After several unsuccessful attempts at using F.E.T.s in gain reduction circuits, Putnam settled upon the straightforward approach of using the F.E.T. as the bottom leg in a voltage divider circuit, which is placed ahead of a preamp stage.

The output stage of the 1176 is a carefully crafted class A line level amplifier, designed to work with the (then) standard load of 600 ohms. The heart of this stage is the output transformer, whose design and performance is critical. Its primary function is to convert the unbalanced nature of the 1176 circuit to a balanced line output, and to provide the proper impedance matching to drive the line impedance of 600 ohms. These two jobs are accomplished by the primary and secondary windings whose turns' ratio defines the impedance ratio.

This transformer is critical due to the fact that it uses several additional sets of windings to provide feedback, which makes it an integral component in the operation of the output amplifier. Putnam spent a great deal of time perfecting the design of this tricky transformer and carefully qualified the few vendors capable of producing it.

The first major modification to the 1176 circuit was designed by Brad Plunkett in an effort to reduce noise--hence the birth of the 1176LN, whose LN stands for low noise. Numerous design improvements followed, resulting in at least 13 revisions of the 1176. Legend has it that the D and E blackface revisions sound the most "authentic".

The original Universal Audio 1176LN designed by Bill Putnam was a major breakthrough in limiter technology - the first true peak limiter with all transistor circuitry offering superior performance and a signature sound. Evolved from the popular Universal Audio 175 and 176 vacuum tube limiters, the 1176LN retained the proven qualities of these industry leaders, and set the standard for all limiters to follow.



## Allen Sides

Allen Sides has always been known for having golden ears when it comes to the sound of equipment. The owner of Ocean Way Studios in Los Angeles and Nashville, he's also a speaker designer and engineer who is especially respected for his work with live musicians, including orchestra and string dates. Among his recent credits are work with the Goo Goo Dolls, Alanis Morissette and Green Day. Sides brings his different perspectives into play when he talks about using the 1176.

“The 1176 is standard equipment for my sessions. I just used them last night, as a matter of fact, on a project for singer Lisa Bonet that Rob Cavallo was producing at Ocean Way. We were recording drums and I used them on the left/right overheads as effects limiters. It's something I learned from (engineer) Don Landy, who worked with Randy Newman a lot. I mult the left and right overheads and bring them back on the console, then insert a pair of 1176s into a pair of the mults. Push in 20 to one and four to one simultaneously and it puts the unit into overdrive creating a very impressive sound.”



## Murray Allen

Murray Allen is a veteran engineer and Director of Post Production for the San Francisco Bay Area company Electronic Arts. He has a fascination for gear both old and new and he explains why he thinks the 1176 has been so popular for so long. “It has a unique sound to it that people like, it's very easy to operate, and it does a great job. You have just two controls relative to the ratio of compression. You have input and output and you have attack and release. That's all there is. It's still my favorite limiter for Fender basses and string basses, because you don't know it's working. It doesn't change the way the bass sounds, it just keeps the level at a more controllable place.

## Ken Kessie

Mixer Ken Kessie (En Vogue, Tony! Toni! Tone!, Celine Dion) is known for being experimental. “Seems like everybody knows the basic tricks for the 1176,” he says, “But here are two that might be lesser known. If you turn the attack knob fully counterclockwise until it clicks, the 1176 ceases to be a compressor and acts only as an amplifier. Sometimes this is the perfect sound for a vocal. And of course the unit can be overdriven, adding another flavor of distortion in case your plug-ins are maxed out!

“Then, for that hard-to-tame lead vocalist (the one that backs up from the mic to whisper and leans in for the big ending chorus), try an 1176 followed by a DBX 165. Use the 1176 as a compressor, and the DBX as a peak limiter...it's guaranteed to be smooth as silk.”

## Jim Scott

Jim Scott shared a Grammy for Best Engineered Album for Tom Petty's Wildflowers. He's also known for his work with Red Hot Chili Peppers, Natalie Merchant and Wilco. "I use 1176s real conservatively and they still do amazing things," he comments. "I'm always on the four to one button, and the Dr. Pepper - you know, 10 o'clock, 2 o'clock, and it does everything I need.

"I always use them on vocals. I use them on room mics, on acoustic guitars- - sometimes in mixing I'll sneak a little on a snare drum or a separated channel of a snare drum. I'm not one of those guys who leaves it on everything, but I'd have to say I've used an 1176 on everything at one time or another.

"They have an equalizer kind of effect, adding a coloration that's bright and clear. Not only do they give you a little more impact from the compression, they also sort of clear things up; maybe a little bottom end gets squeezed out or maybe they are just sort of excitingly solid state or whatever they are. The big thing for me is the clarity, and the improvement in the top end.

"The 1176 has that same kind of phenomenon, where, when you patch something through a Neve equalizer and you don't even engage the EQ, it sounds better. It's just a combination of the amps.

"I also use LA-2As all the time. I use them on bass, and it's one of the compressors I use for reverb. Often I'll send a bunch of things to one LA2A and bring it back into the console like a return - it's great for drums, great for kick drum especially.

"LA-2As warm things up. They're the opposite of the 1176--they EQ all the warmth and low mids and bass. When you put bass and drums in them they get fatter and bigger. And unless you hit them way hard and make the tubes sizzle they don't really distort. Of course, you can get them to sound like an AC30 if you want to, just turn them all the way up. They are very loud, powerful amplifiers.

"I've also used both the 1176 and the LA-2A for stereo buss compressors - you just have to be a little bit careful that your mixes don't go one sided. Tom's [Petty's] records have often been mixed through 1176s. I've also done that with LA-2As - they are of course, more inconsistent piece to piece than the 1176s, because of the tubes and the difference in fatigue of the tubes.

"My big mentors were Andy Johns and Lee DeCarlo and Ron Nevison because they were all Record Plant guys. I learned how to make a rock and roll record from them. Although over the years it's become my own thing, my style still tends to be that Record Plant style, U87s, 1176s, LA-2As, 47 F.E.T.s...it's what I like."





## Mike Clink

Producer/Engineer Mike Clink (Guns N' Roses, Sammy Hagar, Pushmonkey) also comes from the Record Plant school of recording. "I find that I actually use 1176s more now than I ever did," he comments. "I like them because they bring out the brightness and presence of a sound - they give it an energy. It seems like when I'm mixing I end up using an 1176 on the vocals every time. And if I want to compress a room sound I'll take a mono room mic, put an 1176 across it and push in all the buttons."



## Bruce Swedien

Bruce Swedien is a master engineer who needs no introduction. He also is a die-hard 1176 fan. "I have two silverface 1176LNs in my rack that Bill Putnam personally picked out for me," he says. "I remember sitting at Bill's place in the Channel Islands, and talking about the 1176 and how I wanted a pair. The next time we went over he'd picked this pair out and they were sitting in his garage waiting for me. I love them on vocals. All of the Michael Jackson and James Ingram vocals that everyone has heard so much were done with at least one of those 1176s. I couldn't part with them for anything. They sound fabulous."



# Thank You

We would like to thank you again for becoming a Universal Audio customer. We encourage you subscribe to our email lists in [your account profile](#) at [www.uaudio.com](http://www.uaudio.com) so we can keep you informed about UA product developments and promotions.

The Universal Audio Team



# Notices

## Warranty

Universal Audio provides a limited warranty on all hardware products. To learn more, please visit [help.uaudio.com](http://help.uaudio.com). The limited warranty gives you specific legal rights. You may also have other rights which vary by state or country.

## Repair Service

If you are having trouble with Apollo Solo, first check all system setups, connections, software installations, operating instructions, and the [Troubleshooting](#) chart. If that doesn't help, contact our technical support team. To contact technical support or learn more about repair service, please visit [help.uaudio.com](http://help.uaudio.com).



### Maintenance

Apollo Solo does not contain a fuse or any other user-replaceable parts. The unit is internally calibrated at the factory. No internal user adjustments are available.



### Caution

Any changes or modifications to the device not expressly approved by Universal Audio could void the user's right to operate the equipment.

## Important Safety Information



Before using this unit, be sure to carefully read the applicable items of these operating instructions and the safety suggestions. Afterwards, keep them handy for future reference. Take special care to follow the warnings indicated on the unit, as well as in the operating instructions.

- 1) Read these instructions.
- 2) Keep these instructions.
- 3) Heed all warnings.
- 4) Follow all instructions.
- 5) Do not use this apparatus near water.
- 6) Clean only with dry cloth.
- 7) Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
- 8) Do not install near any heat source such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
- 9) Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
- 10) Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
- 11) Only use with attachments/accessories specified by the manufacturer.
- 12) Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use the caution when moving the cart/apparatus combination to avoid injury from tip-over.
- 13) Unplug this apparatus during lightning storms or when unused for long periods of time.
- 14) Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as 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.

### Description of symbols used



The lightning flash represented by the arrow symbol in an equilateral triangle is intended to alert users to the presence of high voltage within the unit that could cause an electrical shock hazard.



The exclamation mark in an equilateral triangle is intended to alert users to the existence of important instructions in the manual relating to the use and maintenance of the unit.

## Compliance

### United States Class B Manual Statement

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. 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 communications. However, there 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 and correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the 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.

### International Class B Statements

- Canada: Innovation, Science and Economic Development Canada Interference Causing Equipment Standard ICES-003, "Information Technology Equipment (ITE)-Limits and methods of measurement", Issue 6, dated January 2016 (class B)
- Japan: VCCI-CISOR 32:2016 "Technical Requirements" for multimedia equipment (class B).  
Japanese Class B Manual Statement:

この装置は、クラスB機器です。この装置は、住宅環境で使用することを目的としています  
が、この装置がラジオやテレビジョン受信機に近接して使用されると、受信障害を引き起  
すことがあります。取扱説明書に従って正しい取り扱いをして下さい。 VCCI-B

(Translation: This is Class B equipment. Although this equipment is intended for use in residential environment, it could cause poor reception if used near a radio television receiver. Please follow instructions in the instruction manual.)

- EN 55022:2010, "Information technology equipment – Radio disturbance characteristics-Limits and method of measurements (Class B)
- CISPR 22:2008, "Information technology equipment- Radio disturbance characteristics – Limits and method of measurement" (Class B)
- EN 55032:2012, "Electromagnetic compatibility of multimedia equipment – Emission Requirements"
- CISPR 32:2012, " Electromagnetic compatibility of multimedia equipment- Emissions requirements"
- EN 55024:2010 "Information technology equipment – Immunity characteristics. Limits and method of measurement"
- CISPR 24:2010 +A1:2015 "Information technology equipment- Immunity characteristics. Limits and method of measurement."
- EN 55035:2017 "Electromagnetic compatibility of multimedia equipment – Immunity requirements"
- TCVN 7189:2009 "Information technology equipment- Radio disturbance characteristics –Limits and method of measurements".
- Korea: KN32/KN35 2015 "Electromagnetic compatibility of multimedia equipment -Emissions and Immunity requirements" Class B

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# Technical Support

## Universal Audio Knowledge Base

The UA Knowledge Base is your complete online technical resource for configuring, operating, troubleshooting, and repairing all UA products.

You can watch helpful support videos, search the Knowledge Base for answers, get updated technical information that may not be available elsewhere, and more.

[UA Knowledge Base](#)

## YouTube Support Channel

The Universal Audio Support Channel at youtube.com includes helpful support videos for setting up and using UA products.

[UA YouTube Support Channel](#)

## Universal Audio Community Forums

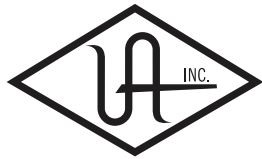
The unofficial UA discussion forums are a valuable resource for all Universal Audio product users. This website is independently owned and operated.

[www.uadforum.com](http://www.uadforum.com)

## Contact Universal Audio Support

To contact the UA support team for technical or repair assistance, please visit:

[help.uaudio.com](http://help.uaudio.com)



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