

RAVENNA/AES67

Virtual Audio Device Guide



No part of this documentation may be reproduced in any form whatsoever or be stored in any data retrieval system without prior written permission of the copyright owners.

This documentation is supplied on an as-is basis. Information contained within this documentation is subject to change at any time without notice and must not be relied upon.

All company and product names are [™] or Registered Trademarks ® of their respective owners. Windows is a trademark of Microsoft Corporation. Yosemite, El Capitan, Sierra, High Sierra, Mojave, Catalina, Big Sur. Core Audio and Bonjour, the Bonjour logo, and the Bonjour symbol are trademarks of Apple Computer, Inc. RAVENNA is a registered trademark of ALC NetworX GmbH and is used here under licence.

Merging Technologies makes no warranties express or implied regarding this software, its quality, performance, merchantability or fitness for a particular purpose. The software is supplied “as is” you, the purchaser, are assuming the entire risk of the results of using this Merging Technologies software. In no circumstances will Merging Technologies, its owners, directors, officers, employees or agents be liable to you for any consequential, incidental or indirect loss or damages including loss of time, loss of business, loss of profits, loss of data or similar resulting from the use of or inability to use the Merging Technologies hardware and or software or for any defect in the hardware software or documentation.

Product features and specifications are subject to change without notice.

© Copyright Merging Technologies Inc. 2021. All rights reserved

Contents

OVERVIEW.....	3
System Requirements.....	3
VAD EDITIONS.....	4
RAVENNA/AES67 Virtual Audio Device Specifications:.....	5
Apple M1 Installation.....	10
Installation Notes.....	12
Virtual Audio Device Panel Configuration:.....	13
OPERATION MODES.....	13
UNITE.....	13
RAVENNA/AES67.....	14
UNITE your easy pass into the AoIP world.....	18
UNITE MODE / PROCEDURE.....	19
RAV/AES67 MODE.....	22
Remote MIDI Pre control (for Premium users only).....	23
TROUBLESHOOTING.....	26
FOR MORE INFORMATION.....	28

OVERVIEW

The Merging **Virtual Audio Device Standard edition** is free of charge, intended for owners of a Network Interface hardware RAVENNA or AES67 compatible who wish to work under Mac OS.

The **Virtual Audio Device Premium edition** is bundled free of charge for owners of at least Merging Horus, Hapi or Anubis who wish to work under Mac OS. It requires at least one Merging device to be detected over the network

Virtual Audio Device driver

Apple's Audio Drivers (Core Audio) is a standardized audio driver system for all Macintosh computers running on Mac OS X allowing access to all Core Audio compatible audio interfaces

System Requirements

Certified MAC Operating Systems (OS) The Core Audio driver and VAD are qualified under macOS

- **Yosemite*** 10.10.x: RAVENNA -VAD (Core Audio) v2.0.31254.dmg - Not Supported with v2.1.x
- **El Capitan*** 10.11.x: RAVENNA -VAD (Core Audio) v2.0.31254.dmg - Not Supported with v2.1.x
- **Sierra*** 10.12.x: RAVENNA -VAD (Core Audio) v2.0.31254.dmg - Not Supported with v2.1.x
- **High Sierra*** 10.13.x: RAVENNA -VAD (Core Audio) v2.0.36877.dmg and higher
- **Mojave** 10.14.1 to 10.14.4: RAVENNA -VAD (Core Audio) v2.0.36877.dmg and higher
- **Mojave** 10.14.5 and 10.14.6: RAVENNA -VAD (Core Audio) v2.1.41964.dmg and higher
- **Catalina** 10.15.1 to 10.15.6: RAVENNA -VAD (Core Audio) v2.1.41964.dmg and higher
- **Big Sur** (Mac Intel & M1) 11.2.3: RAVENNA -VAD (Core Audio) v3.0.47300.dmg and higher

** Legacy macOS no longer supported by Apple nor Merging. Works as is.*

Warning: Users updating to Horus-Hapi firmware v3.9.4 and above must install VAD 2.0.39648 and higher.

Warning: 10Gb Ethernet Adaptors are not certified for VAD usage. Please consider the use of an Apple or Belkin USB-C to ETH adapter if you have such a Hardware Interface.

Merging MacOS Configuration Guides

<https://confluence.merging.com/display/PUBLICDOC/Mac+Configuration+Guide>

VAD EDITIONS

Virtual Audio Device **Standard edition**:

- The latency can be set to 1ms (48-AES67), 4ms (192), 6ms (288), 10ms (480)

Note: effective latency depends on Application buffer size

- The driver can be used as default device and System (alert) device.
- Mac Parental Controls and Security Firewall should be switched OFF
- Numbers of inputs and outputs available • 1fs (44.1kHz / 48kHz) = 64 I/O

Note: The number of I/Os could be less if the application does not support these numbers

Warning: If you encounter issues such as glitches, reduce the IO count, since Performance is dependent on system Performance & Configuration

Recent Macs could be subject to a potential hardware issue <http://cdm.link/2019/02/apple-2018-glitch/>

- Refer to the **Configure Merging and AES67 devices guide** for more details

<http://www.merging.com/products/networked-audio/downloads>

This guide is installed along with your **Virtual Audio Device** driver

Virtual Audio Device **Premium edition**:

- Requires at least one Merging Network Interface Hardware (Horus, Hapi or Anubis) on your network

- Anubis is supported as of VAD 2.0.39648 and higher
- The latency can be set to 16, 32, 48 (AES 67), 64, 128, 192*, 288* and 480* samples

Note: effective latency depends on Application buffer size

** with version above 2.1.41930.dmg*

- The driver can be used as default device and System (alert) device.
- Mac Parental Controls and Security Firewall should be switched OFF refer to our configuration guides for all details

<https://confluence.merging.com/display/PUBLICDOC/Mac+Configuration+Guide>

- Numbers of inputs and outputs available 128 I/O at all sampling rates

Note: The number of I/Os could be less if the application does not support these numbers

Warning: If you encounter issues such as glitches, reduce the IO count, since Performance is dependent on system Performance & Configuration

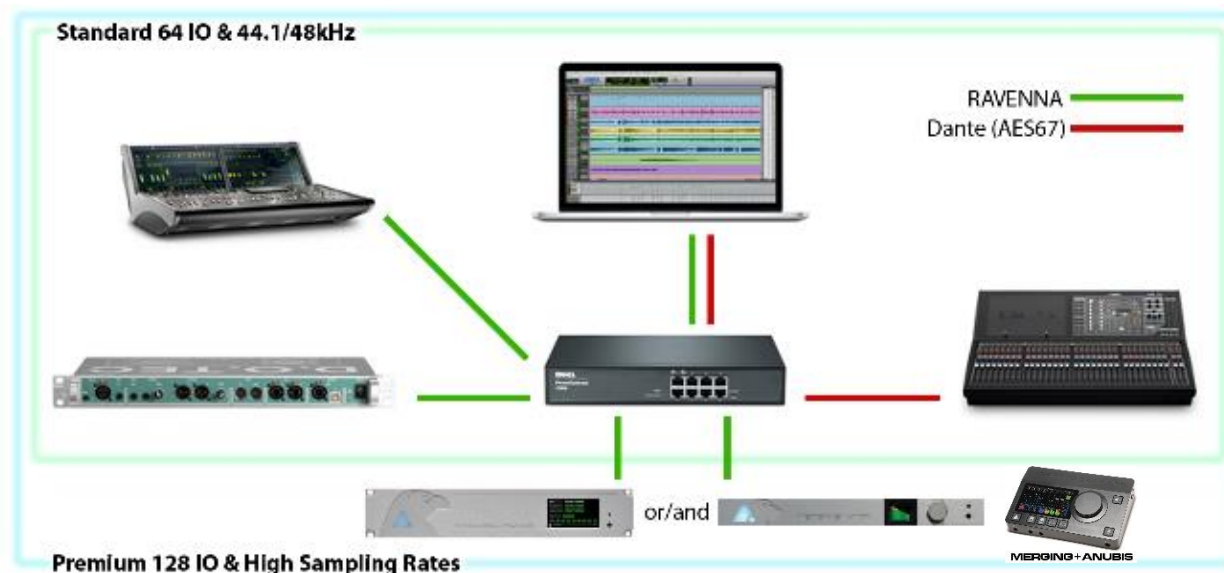
- Users can use UNITE or ANEMAN installed along with their RAVENNA/AES67 Interface & Driver to perform their IO connections. Refer to the User Manuals, installed along the VAD under *Applications>Merging Technologies>Docs*

RAVENNA/AES67 Virtual Audio Device **Specifications:**

Driver	RAVENNA/AES67 ¹ Virtual Audio Device	
	STANDARD Edition v3.0	PREMIUM Edition v3.0
Requirements	Any AES67 compatible device	Requires at least one Merging Network Interface connected over the network (e.g. Horus, Hapi or Anubis)
Operating System macOS	Yosemite* 10.10.X - ElCapitan* 10.11.X - Sierra* 10.12.X - High Sierra** 10.13.X - Mojave 10.14.X*** - Catalina 10.15.X*** - Big Sur 11.3.1****	
Latency	1ms (48-AES67), 4ms (192), 6ms (288), 10ms (480)	
Sampling rate supported	44.1/48kHz	
I/O @ 44.1/48kHz	64 Inputs and Outputs ²	128 Inputs and Outputs ²
I/O @ 88.2/96kHz	Not Available	128 Inputs and Outputs ²
I/O @ 176.4/192kHz	Not Available	128 Inputs and Outputs ²
I/O @ 352.8/384kHz/DSD	Not Available	128 Inputs and Outputs ²
MIDI Pre Amps	Not Available	MIDI Pre Amps & Din support
Bundled application	MT Discovery	MT Discovery
¹ SAP implemented in device so no need for a RAVENNA-2-SAP (SIP is not supported)		
² The I/O performance will vary with the system configuration.		
* Yosemite, ElCapitan and Sierra are LEGACY. Not supported anymore by Apple nor Merging. Works as is. Older VAD do not support MERGING+ANUBIS		
** High Sierra has been certified under VAD version 2.0.37039.dmg and higher. Merging now recommends version 2.1.41930 and higher		
*** Mojave 10.14.X and Catalina 10.15.X supported. VAD v2.1.45186 and higher recommended.		
**** Big Sur 11.2.1 is supported as of VAD 3.0.0b47300 and higher on both Intel and M1 (ARM/Silicon) Mac - Refer to the latest VAD User Guide for M1 installation		
MERGING+ANUBIS is supported as of VAD version 2.0.37039.dmg and higher		
ANEMAN is installed along the VAD and can be download for older VAD version https://www.merging.com/support/downloads#aneman		
Warning: Recent Mac come with a 10Gb ethernet interface that is not support by RAVENNA today. Using an external adaptor USB-C to ETH is recommended in such case		

STANDARD version: Free with any RAVENNA/AES67 Hardware compatible device

PREMIUM version: Bundled free for owners of a Merging Network Interface



Installing the Merging Virtual Audio Device

Prerequisites

The Merging **Virtual Audio Device** driver can be installed as a stand-alone driver, at least one Network hardware RAVENNA or AES67 compatible is required for the Driver to be operational.

OS

Refer to the System Requirements above

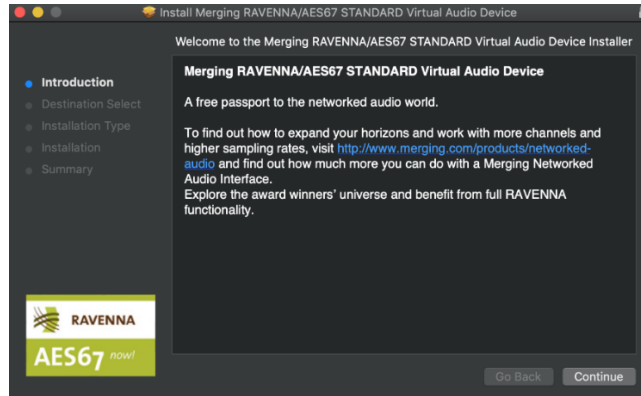
WARNING: Apple M1 systems requires additional steps in the installation procedure. Refer to the M1 installation notice.

Procedure (Mac Intel)

1. Download the Merging **Virtual Audio Device** Installer for MAC.
<http://www.merging.com/products/networked-audio/downloads>
2. Open the Merging_RAVENNA_AES67_VAD_Standard_Installer.dmg file and mouse click on it



3. Click on Continue to proceed with the installation.

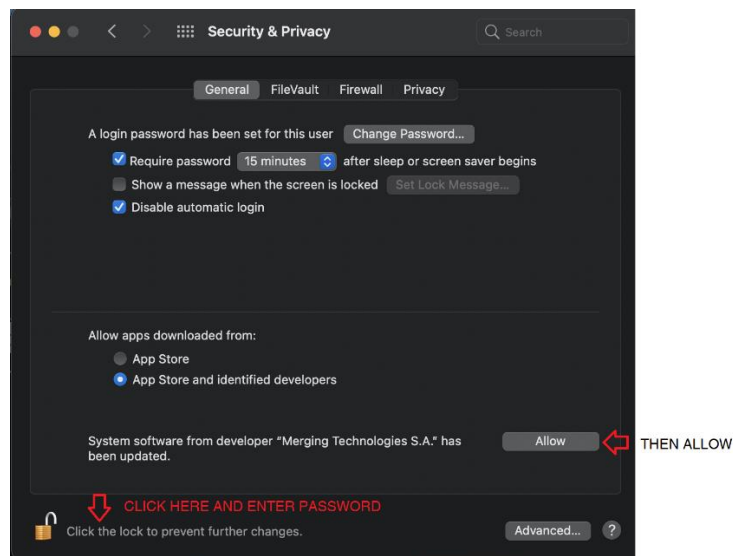


4. Follow the installer instructions. You will be prompted to enter the Administrator password
5. During the installation you will prompt that the Merging RAVENNA Audio Device hasn't been notarized or is from an unidentified developer.



Mac M1 Users must refer to the section [here](#)

6. Open the System Preferences > Security & Privacy, when asked.
7. Click on the Lock to enter your password and then press the Open Anyway entry to confirm your intent to open or install the app.

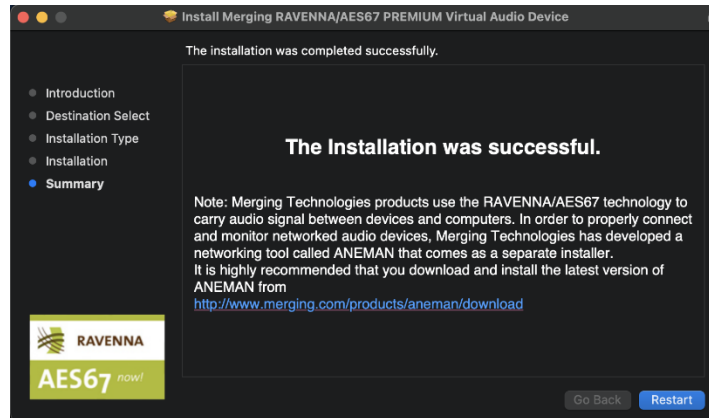


The app is now saved as an exception to your security settings

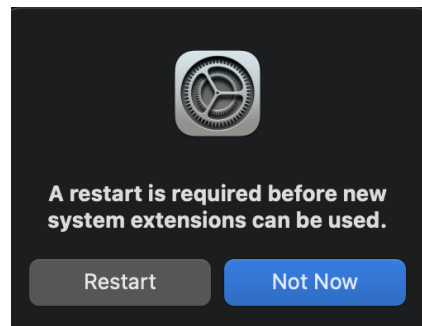
Warning: You have about 30 min to do so otherwise the application might not run and it could require an uninstall and reinstall of the VAD.

8. it will display Successful. Click Close to exit

Note: At times point 9. Can come before 8. Processed with a restart anyhow if installation was successful

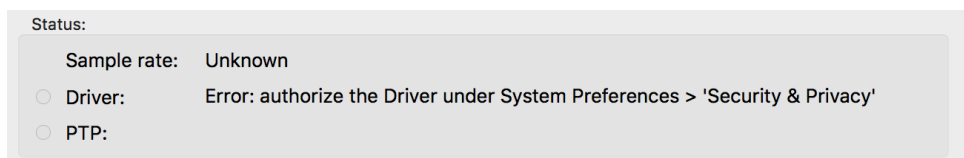


9. Restart the MAC after the driver installation and once the notarization is completed.



IMPORTANT:

If the Driver is not well authorized a warning should be displayed on the Driver VAD Panel



The OS requires you to immediately authorized the Driver by going to the System Preferences>Security& Privacy and Allow the driver if it is listed in the General Settings under "Software Developer".

The "ALLOW" button might not be clickable in remote access please connect a mouse locally and have a local access to the mac in order to select the "Allow" option. There is a possibility that this message does not show, that depends on how the macOS update was performed.

10. Go into MAC System Preferences, in Other open the Merging RAVENNA icon.



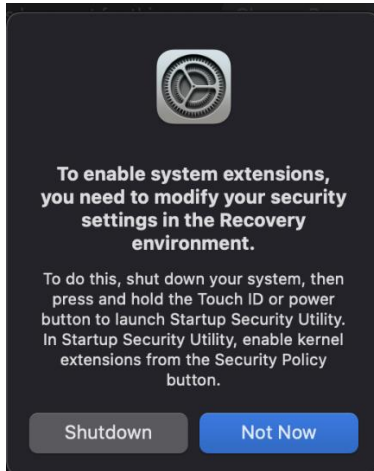
11. Configure the application you wish to use (DAW) so that the I/O connections use the Virtual Audio Device in order to perform that task use either the UNITE or RAV/AES67 mode

Apple M1 Installation

Supported as of Big Sur 11.2.3 running RAVENNA -VAD (Core Audio) v3.0.47227

Here is how to install the VAD on a Mac running on the latest Apple Silicon M1 chip.

1. Follow Point 1 to 7 of the VAD installation above.
2. After point 7. You should be prompt to enable your Mac system extensions Click on Shutdown
This procedure will apply the first time you install an application requiring Reduced Security.



3. Press the Mac power button until you see a black screen
4. Select the drive where you have installed the VAD to boot on.



5. Select "Reduced Security" and check the first option, do not select Full security.

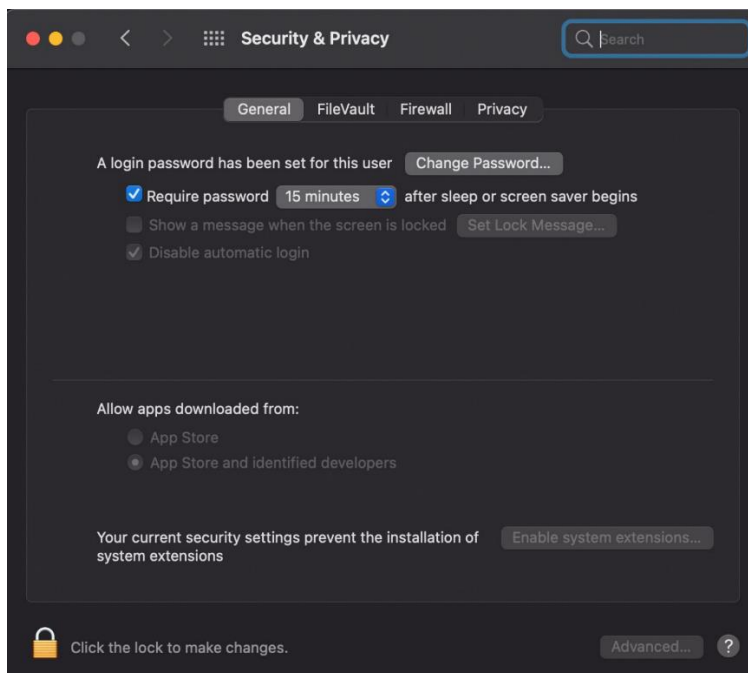


6. Type in your password.

7. Shutdown your mac from the top left menu

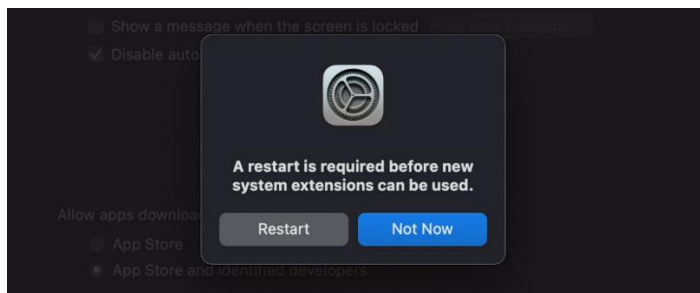


8. After restarting your mac normally, open the system preferences and go to “Security & Privacy”



9. Click the Lock symbol, entre your password and press the “Allow” Button.

10. You will be asked to restart your mac one more time. Hit the restart button



11. The MERGING VAD should now be installed and running. Its panel can be opened from the System Preferences

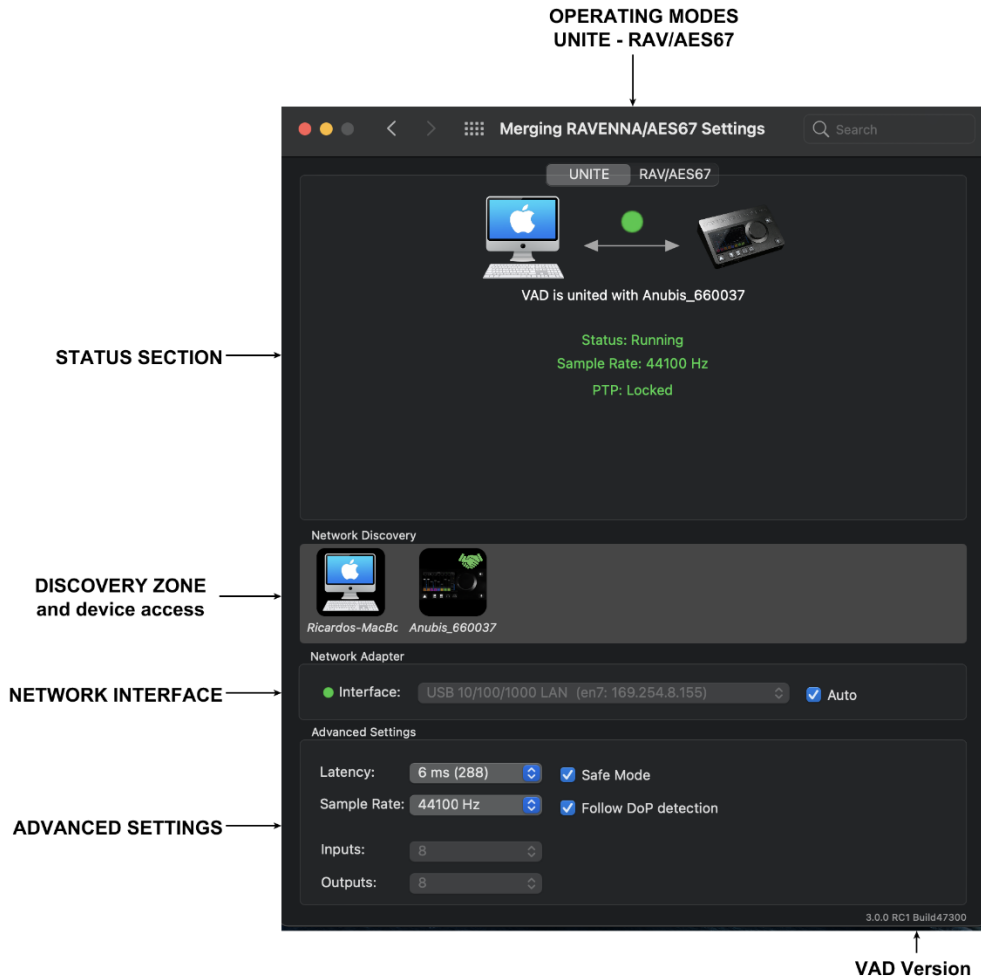
Installation Notes.

The VAD installer includes ANEMAN that is the Merging Audio NETwork MANager that will allow you to connect, monitor, and manage your networked audio devices.

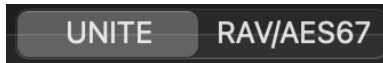
Please download and install the latest ANEMAN in order to manage and monitor your AoIP devices from www.aneman.net/#download . As of the MERGING RAVENNA Audio Device v3.0 user can use UNITE instead of ANEMAN for simple set up AoIP connections.

For simplified connectivity we recommend the use of UNITE rather than ANEMAN.

Virtual Audio Device **Panel Configuration:**



OPERATION **MODES**



UNITE

UNITE is an automatic AoIP Stream patching feature that allows a user with a mouse click to connect all IO between the Anubis and the System/Driver. Highly recommended for users with just one Anubis and one other device that wish to avoid AoIP complexity.

*Important: UNITE is supported with Anubis Music Mission, Horus and Hapi.
Unite is not supported when Anubis is running the Monitor Mission.*

RAVENNA/AES67 (RAV/AES67)

Provides full control over your AoIP RAVENNA/AES67 streams connections, using ANEMAN Audio NETwork MANager.

STATUS SECTION

The status section will inform you of the current state of your network and device state, such as streams status, sampling rate and PTP clocking.

The section also provides device connectivity tools and error messages reports. Refer to the UNITE or RAV/AES67 mode for more details.

Status

- Network Connections:
 - RED: Connections not valid – Error indication.



- GREEN: Connections Valid
- Driver:
 - Gray: Driver stuck
 - Green: Driver properly running
 - Red: Problem detected.
 - PTP*:
 - Green: PTP locked
 - Yellow: PTP locking
 - Red blinking: PTP unlocked

** PTP support for any domain (not only 0) is supported with VAD premium version 2.0.37746.dmg and above*

DISCOVERY ZONE

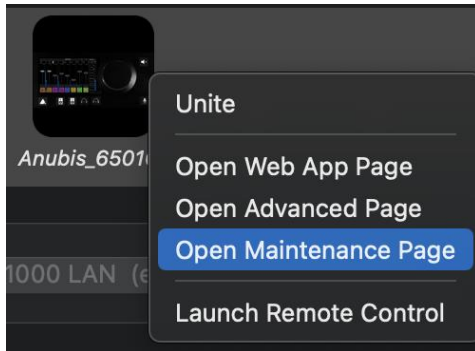
Discovery section and devices options access.

Online RAVENNA Devices:

The panel shows an icon for each RAVENNA device online.

- Clicking on the computer icon opens the Advanced Settings RAVENNA pages
- Clicking on the RAVENNA/AES67 Network Hardware icon opens the web browser and loads the Remote Access web pages.

Menu Access options



UNITE / UN-UNITE

Refer to the UNITE mode and procedure for all details. Selection UNITE will automatically connect your AoIP streams.

Open Web Access

Selecting this entry will open the web browser and loads the Remote Access Web page page of your device.

Open Advanced Page:

Will open the Advanced Settings pages, this can be useful in order to connect 3rd party hardware IO to the VAD. Refer to our Advanced Settings Guidelines for more details.

<https://confluence.merging.com/pages/viewpage.action?pageId=33260125>

Open Maintenance Mode :

Allows the user to perform a firmware update of the device. Refer to the User Manual of your device fo

NETWORK INTERFACE:

Lists all available network ports. Select the network port the Network Interface is connected to.

- Gray: No interface or interface not properly configured, preventing driver to run
- Green: Driver properly running and Interface at 1Gb
- Yellow: Interface at 100Mb
- Red: Potential security issue

Auto mode: When checked the VAD will automatically choose the online interface where a Merging Device is connected.

ADVANCED SETTINGS:**VAD Standard Latencies:**

- ✓ 1 ms (48)
- 4 ms (192)
- 6 ms (288)
- 10 ms (480)

VAD Premium Latencies:

- 0.33 ms (16)
- 0.67 ms (32)
- 1 ms (48)
- ✓ 1.33 ms (64)
- 2.67 ms (128)
- 4 ms (192)
- 5.33 ms (256)
- 6 ms (288)
- 10 ms (480)

1.33ms (64 samples). Merging recommended latency along with 48 samples AES67.

1ms (48 samples) recommended for AES67 compliance (VAD Standard/Premium)

16, 32, 48, 64, 128, 192*, 288* and 480* samples (VAD Premium)

** with version above 2.1.41930 dmg and above*

Supported Host Framing: 48 - 64 - 128 samples

Safe Mode:

Depending of the configuration in place enabling this mode will ease up the play engine and could prevent some clicks from occurring

Follow DoP Mode:

Identifies if the data stream provided by the application is DoP in that case the VAD is reconfigured in DSD

Frequency:

Standard: Fixed at 44.1kHz or 48kHz

Premium: 44.1/48kHz, 88.2/96kHz, 176.4/192kHz, 352.4/384 kHz, DSD64, DSD128, DSD256

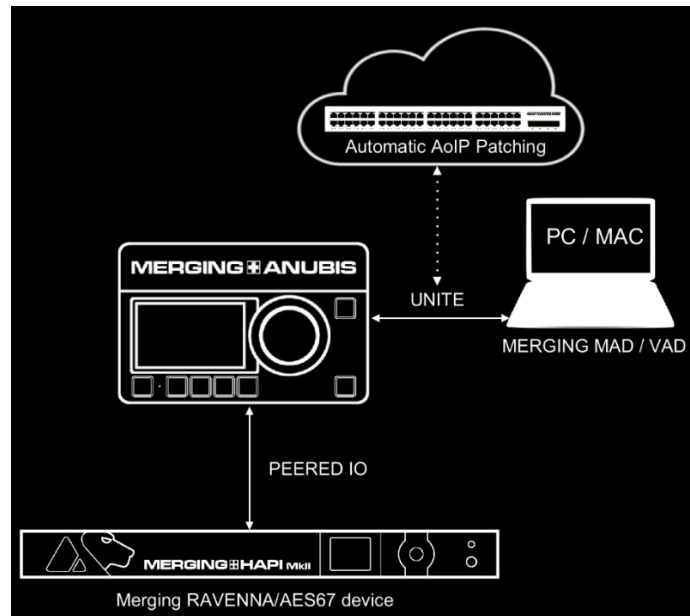
Number of Channels:

Inputs: • 0,2,8,16,32,40,48,56,64 (Premium goes up to 128)

Outputs • 0,2,8,16,32,40,48,56,64 (Premium goes up to 128)

Note: MERGING+ANUBIS is supported as of ANEMAN v1.1.7 build 39648 and higher

UNITE your easy pass into the AoIP world



A Merging device and a Merging Driver is all you need to UNITE and simplify your RAVENNA/AES67 network streams connectivity without the need of an additional software such as ANEMAN.

What is the UNITE feature?

UNITE is an automatic AoIP Stream patching feature that allows a user with a mouse click to connect all IO between the Anubis and the System/Driver.

Expand your IO by adding a Merging RAVENNA/AES67 interface on your network or directly connect it to Anubis, peer some of those IO's and once performing UNITE all those IO can be made available in your DAW.

Important: UNITE is supported with Anubis Music Mission, Horus and Hapi.

Unite is not supported when Anubis is running the Monitor Mission, which requires the use of the RAV/AES67 mode

What is the PEERING feature?

PEER your additional device IO from Anubis and those IO's will immediately be available in your Anubis Mixer, it will expand your Mixer Channels and Output Channels Control, Mix, Record or Route those IO's to any available device online without the need of any system/DAW.

Note: All Missions support Peering. More information on Peering in the Anubis Mission Manuals.

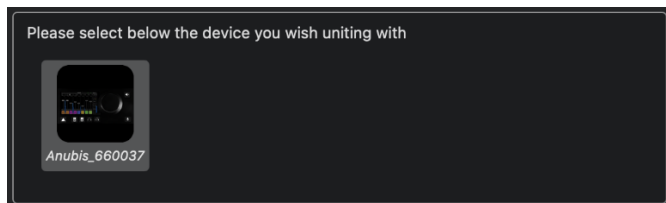
UNITE MODE / PROCEDURE

Unite simplifies your AoIP connectivity by bringing you a quick automatic stream patching.

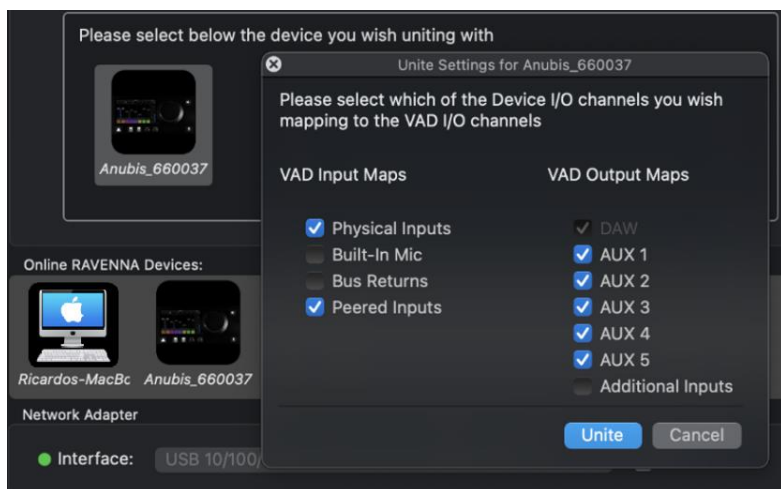
1. Select the UNITE mode tab (Middle left)



2. Click on one of the Device made available for you to UNITE. In example below we will UNITE the Anubis.



3. This will open a menu from where you can select the IO's that will be Automatically Connect and available in your application (e.g. DAW).



4. Check the IO's you wish to automatically connect

Anubis UNITE Settings: The Anubis has more flexibility in the UNITE choices then Horus or HAPI.

VAD Inputs Maps

- Physical Inputs: Anubis inputs Combo 1/2 and Line-Instrument 3/4
- Built-in Mic: Anubis Built-in Talkback
- Bus Returns: Anubis Music Mission returns: Mix, MixAlt, Cues, Reverb, Dynamics. Connect for record back

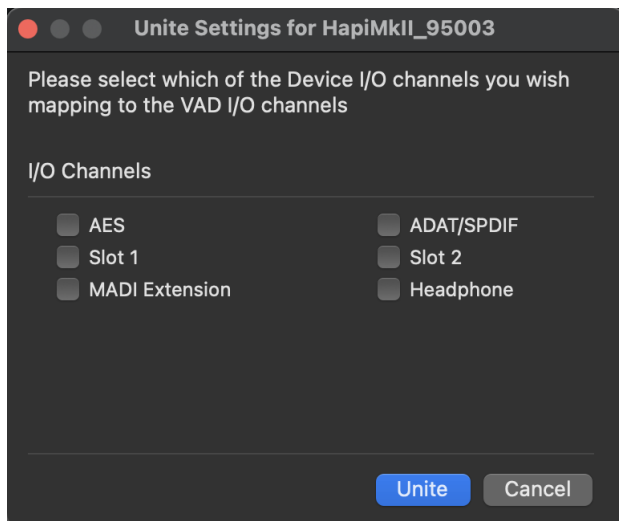
- Peered Inputs: Applies to users with another Merging RAVENNA/AES67 Interface that was peered by Anubis, refer to the Anubis User Manuals.

VAD Outputs Maps

- DAW: Your DAW or Application Software Output Playback (stereo)
- AUX 1 to 5: Additional Software Output Playback stereo pairs for your DAW or Application.
- Additional Outputs: AES67 Generic Streams (up to 48 channels). Requires AES67 compatible devices and Anubis running Music Mission.

Horus & Hapi UNITE Settings:

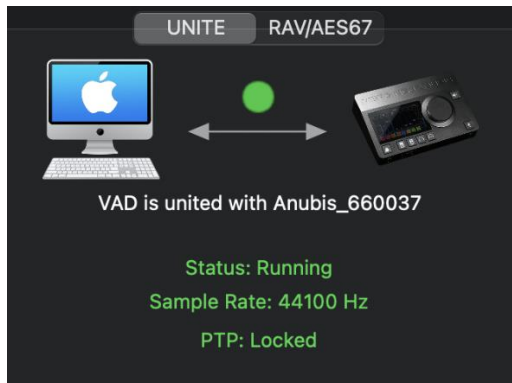
Offers connecting choices by Modules and Interfaces.



Hapi MKI / MKII		
AES 1	ADAT/SPDIF	
Slot 1	Slot 2	
MADI Extension	Headphone	
Horus		
AES 1	AES 2	AES 3
Slot 1	Slot 2	Slot 3
Slot 4	Slot 5	Slot 6
MADI	MADI Extension	Headphone

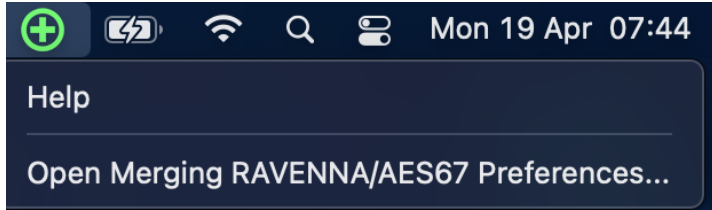
Note: All connections will be made upon sufficient IO selected in the VAD panel settings.

5. Once selecting Unite the AoIP connections between the Device and the VAD will automatically be made.



UNITE Taskbar Status Indicator

At the top of your Mac taskbar you will find the UNITE Status cross icon



VAD Panel green cross icon – Proper operational state



VAD Panel red cross – Potentially Connection issue.



Click on the Blinking Cross icon to open the VAD Panel and view the error reported.



“Invalid connections”

Resolution: In the example here, the solution is to Re-Unite.

RAV/AES67 MODE

Provides full control over your AoIP RAVENNA/AES67 streams connections, using ANEMAN Audio NETwork MANager.



Launch ANEMAN:

Please first download and install the latest ANEMAN from: www.aneman.net/#download
Will open ANEMAN an Audio NETwork MANager, that will allow you to connect, monitor, and manage your networked audio devices.

Refer to the ANEMAN User Guide installed along the VAD for all details

Remote MIDI Pre control (for Premium users only)

The Remote PreAmp control are available only with the Virtual Audio Device **Premium** version

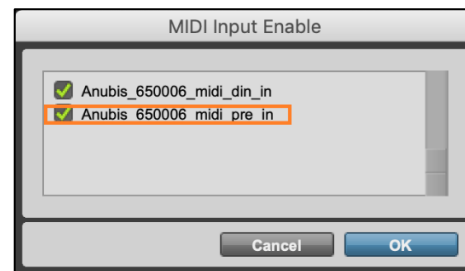
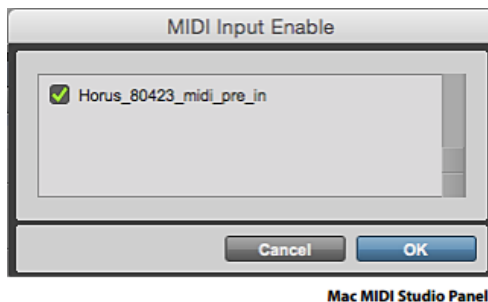
Pro Tools on Mac

Horus / Hapi / Anubis analog preamps can be controlled directly from within Avid Pro Tools running on a Mac. (using Virtual Audio Device Premium). In order to set Pro Tools up for Horus / Hapi / Anubis preamp control follow this procedure:

1. Check the Horus / Hapi / Anubis firmware version and update if necessary, to the latest version.
2. Connect Horus / Hapi / Anubis to the system running Pro Tools through the Ethernet port.

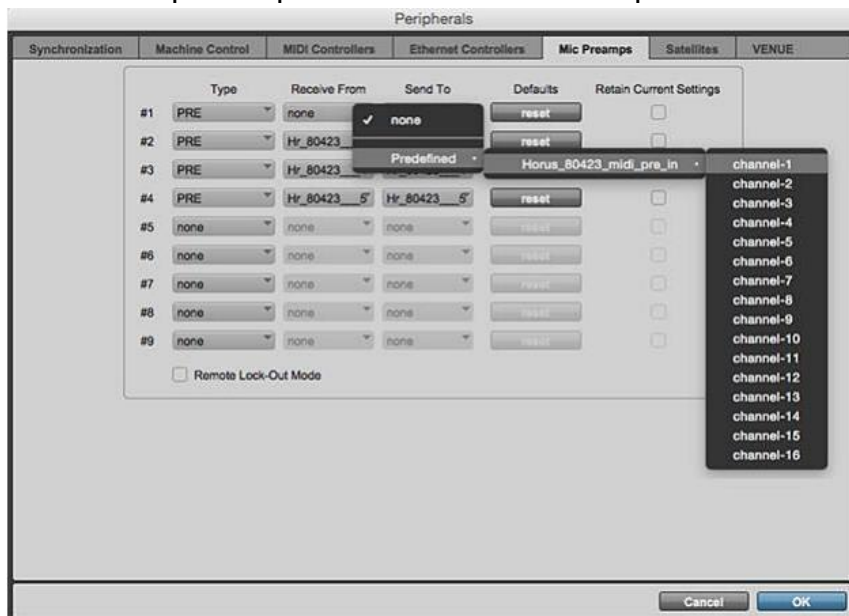
Within Pro Tools

3. Launch Pro Tools and configure to work with RAVENNA Core Audio I/O.
4. Open Pro Tools Setup>MIDI>Input Devices...



5. Enable the Merging RAVENNA interface (Horus, Hapi or Anubis).

6. Open Pro Tools>Setup>Peripherals Settings.
7. In the Peripherals panel select the Mic Preamps tab:



Peripherals panel - Mic Preamps tab

8. Select in order:

Type PRE
Receive From Horus_80xxx_midi_pre_in (or Anubis_65XXXX_midi_pre_in)
Send To Horus_80xxx_midi_pre_out (or Anubis_65XXXX_midi_pre_out)

Note:

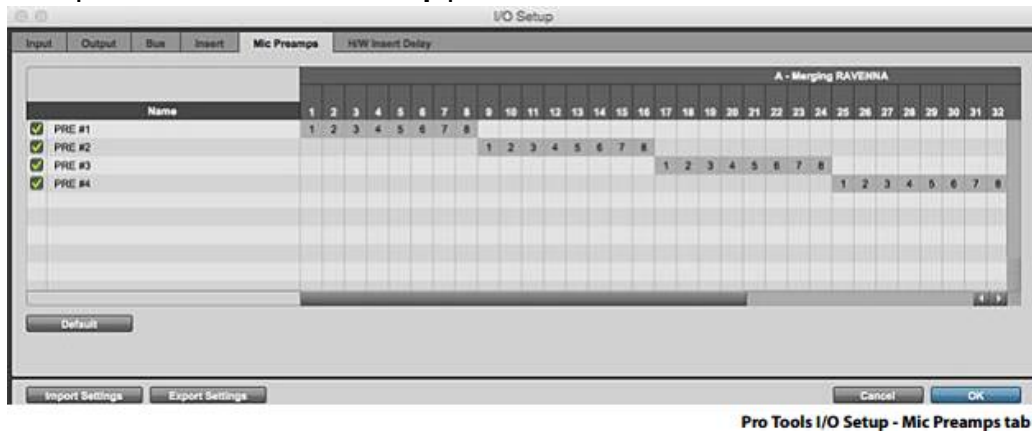
- For the first AD module Receive From > Channel 1 and Send To Channel 1 must be set (typical: Anubis)
- For the second AD module Receive From > Channel 2 and Send To Channel 2 must be set.
- For the third AD module Receive From > Channel 3 and Send To Channel 3 must be set.
- For the fourth AD module Receive From > Channel 4 and Send To Channel 4 must be set

Warning: Horus and Hapi users must verify the order of their AD modules as the Channel numbering is based on slot position. Anubis users will typically receive from Channel 1 to Channel 1

9. Click on OK to close the Peripherals panel.

Within Pro Tools

10. Open the Pro Tools **I/O Setup** panel:



11. In the **Mic Preamps** tab enable **Horus PRE #1** etc. check the boxes to the left of the entries.

12. Click on OK to close the **I/O Setup** panel.

The Horus, Hapi and Anubis Preamp controls will be available within Pro Tools when the Horus / Hapi / Anubis Preamps are connected to the Pro Tools Mixer Strip Inputs.

Note: Information about the MIDI-Din are available in the Merging Knowledge Database

<https://confluence.merging.com/pages/viewpage.action?pageId=73662590>

TROUBLESHOOTING

MAC OS Configuration Guides

It is highly recommended to follow our configuration guides prior to operating the Merging RAVENNA/AES67 Virtual Audio Device.

<https://confluence.merging.com/display/PUBLICDOC/Mac+OS+X+10.15+Catalina+Optimization+Guide>

RAVENNA Core Audio Settings

For proper driver functioning check that the RAVENNA Core Audio panel is showed with all LEDS showing green.

Note: When the interface is shown as available (yellow or green led), the system could take some time to configure the interface (several seconds).

Latency and Clicks

Audible pops and clicks can occur when using some third-party audio interfaces or depending on the speed of the processor. To avoid this problem increase the Hardware Buffer size for the device. You should aim for the lowest possible I/O buffer size value that doesn't introduce clicks, pops, and crackles in the audio. If pops and clicks persists try reducing the IO count in the VAD panel.

Security Firewall

The Mac Firewall can block RAVENNA/AES67 communication, we recommend that you turn it off

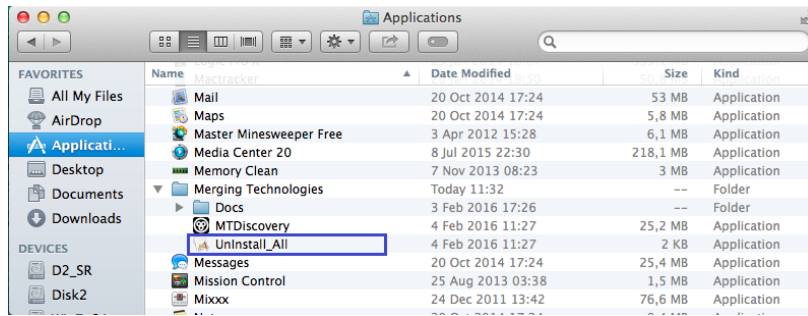


Privacy

We recommend that you disable the Parental control as well

Uninstalling the Merging Virtual Audio Device:

Use the uninstaller to remove the Merging Virtual Audio Device installation cleanly



WARNING: 10Gb Ethernet Adaptors are not certified for VAD usage. Please consider the use of an Apple or Belkin USB-C to ETH adapter if you have such a Hardware Interface.

FOR MORE **INFORMATION**

MERGING Downloads

<https://www.merging.com/support/downloads>

Knowledge Database, FAQs and Tutorials

<https://confluence.merging.com/display/PUBLICDOC/Merging+Public+Document+Home>

MERGING+ANUBIS USE CASES

<https://confluence.merging.com/pages/viewpage.action?pageId=60031175>

MERGING SUPPORT

support@merging.com

MERGING YouTube CHANNEL

https://www.youtube.com/channel/UCR5q_dlb9dYnXTrVDWMshgw