MERGING ✚ NADAC

RAVENNA ASIO & Core Audio Guide

For Merging **Technologies** NADAC

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For Merging Technologies NADAQ

Contents

RAVENNA ASIO & Core Audio
For MERGING +NADAC

Bonjour

1 Introduction

The Network

Merging NADAC connects on the network using the Ethernet based RAVENNA protocol to any Music Server, Player or Streamer supporting ASIO on Windows, CoreAudio/DoP on MacOSX and through a direct RAVENNA connection on Linux. The Precision Time Protocol (PTP2 or IEEE 1588-2008) is at the heart of the RAVENNA protocol, ensuring an ultimate clock precision of one nanosecond and a full compatibility with the AES Audio-over-IP standard AES67.
The flexibility of RAVENNA allows for the NADAC to easily connect from the front panel menu to any Music Server, Player or Streamer on the network and receive multichannel PCM, DXD or DSD. The main outputs and the headphones outputs of NADAC can connect to different playlists or zones, or even different server, player or streamer, allowing for instance to preview your next song on the headphones while listening to your current track on the main outputs.

RAVENNA

RAVENNA is a solution for real-time distribution of audio and other media content in IP-based network environments. It was designed primarily by a company called ALC NetworX. RAVENNA utilizes standardized network protocols and technologies and can operate in existing network infrastructures. Performance and capacity scale with the capabilities of the underlying network architecture.

For more information about RAVENNA technology **please see: Introduction to RAVENNA Technology on page 6** and:

Scope

This document is intended to get you up and running RAVENNA in ASIO/CoreAudio with your Merging Technologies NADAC on your PC Windows system or MAC OS X system.

2 Introduction to RAVENNA Technology

Scope
The information in this chapter is provided as background of the philosophy and technology behind RAVENNA.

Overview
RAVENNA is a technology for real-time distribution of audio and other media content in IP-based network environments. Utilizing standardized network protocols and technologies, RAVENNA can operate on existing network infrastructures. RAVENNA is designed to meet the strict requirements of the pro audio market featuring low latency, full signal transparency and high reliability.

RAVENNA is suitable for deployment in many pro audio market segments including broadcast, live sound, studios the install market and location music recording. Possible fields of application include (but are not limited to) in-house signal distribution in broadcasting houses, theaters, concert halls and other fixed installations, flexible set-ups at venues and live events, OB van support, interfacility links across WAN connections and in production & recording applications.

In short, it represents a new take on the third generation form of audio interconnect, where the first generation of interconnect is analogue point-to point copper, the second generation uses digital codes representing the analogue signal, conveyed point to point over copper or fibre-optic cabling and the third generation also employs digital codes representing the analogue audio but transported as packets over network infrastructure.

RAVENNA is very well suited to areas where complex audio routing / mixing systems are deployed. For example; in-house distribution in broadcasting centers and WAN connections to satellite studios, OB vans, where hook up to venues with the same infra-structure becomes simple, in venues themselves for local signal distribution and connection to just such OB vehicles when required. For live events and concerts it offers highly flexible temporary installation possibilities and in theatres, opera houses and houses of worship it can provide low cost local signal distribution. Notwithstanding all of the above, RAVENNA is also an excellent candidate for relatively simple point to point interconnects such as computer to audio interface.

However, RAVENNA, leaving aside the other advantages touted, is an open standard based on the ubiquitous IP protocol. Specifically, protocol levels on or above layer 3 of the OSI reference model. Since RAVENNA is purely based on layer 3 protocols, it can operate in most existing network environments. Unlike layer 1 or layer 2 solutions, it does not, in principle, require its own network infrastructure. IP can be therefore be transported on virtually any LAN and is used as the base layer for communication across WAN connections (including the internet). Although in most cases Ethernet will be deployed as the underlying data link layer, IP is in general infrastructure- agnostic and can be used on virtually any network technology and topology. All the protocols and mechanisms used in RAVENNA are based on well-established and commonly used methods from the IT and audio industries and comply with various standards defined and maintained by the international standards bodies.

Basic Components
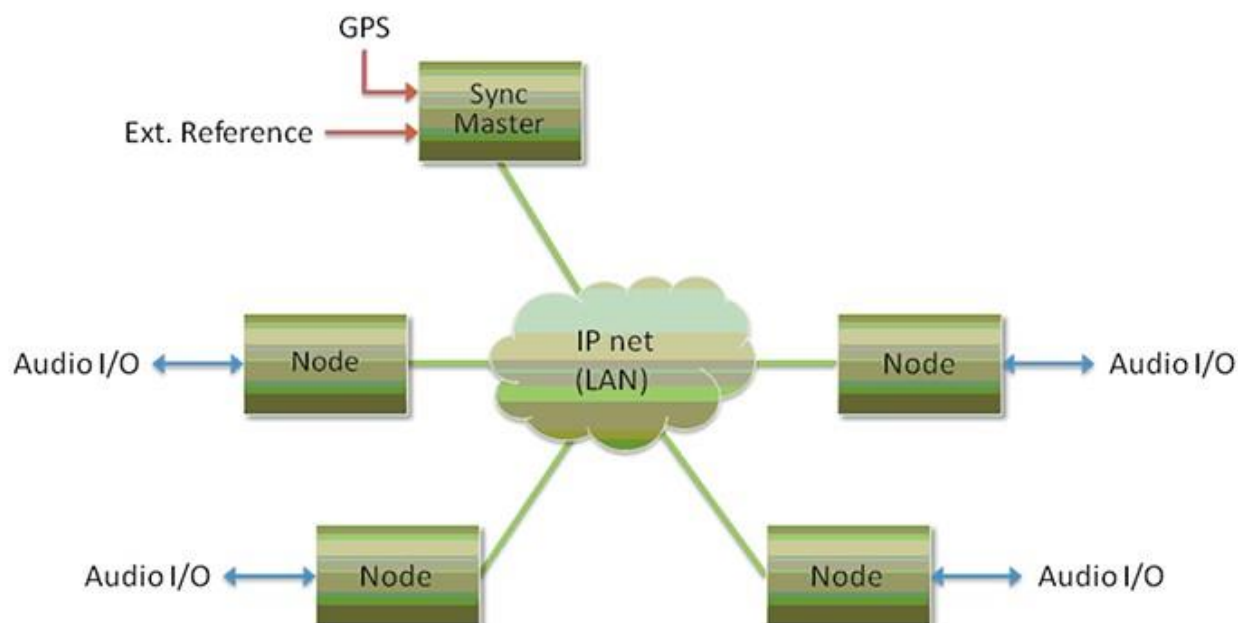
RAVENNA Network Basic Components Example

A RAVENNA system requires a carefully configured IP network, a master clock device and any number of RAVENNA enabled I/O nodes. The master clock can be either a dedicated device or any RAVENNA node capable of serving as a grandmaster. The preferred time domain reference is GPS. Simple streaming across a network can be achieved without any synchronization at all but in pro audio applications tight synchronization between all devices and streams is absolutely mandatory. While playback synchronization in most applications requires sample accuracy, one goal for RAVENNA is to provide superior performance by offering phase-accurate synchronization as an option thus rendering separate reference word clock distribution throughout a facility or venue redundant.

Flexibility

The system design approach allows for operation with or without centralized services for configuration / connection management. ALC NetworX recommends that basic device configuration (e.g. initial settings and setup of audio streams) should be executed via a web interface (http). However other methods may be used in addition or as an alternative.

Device discovery is accomplished with DNS-SD (via an mDNS or DNS service). In small networks, without DHCP / DNS servers, the zeroconf mechanism - a fully automatic, self-configuring method - is used for auto-IP assignment and service advertisement & discovery.

Streams available on the network are represented by SDP records with extended information (i.e. a clock domain identifier, RTP time stamp association etc.) Clients can connect to streams via RTSP or SDP/http.

Resilience

As you would expect RAVENNA supports redundancy. Although modern network infrastructures can be configured to guarantee a high level of transport security and reliable 24/7 operation for added security there is the option of full network redundancy. Some RAVENNA devices can include two independent network interfaces which can be connected to independent physical networks. By duplicating any outgoing stream to both network links, any destination device will receive the full stream data on both network interfaces independently. If data from one link is corrupted, or one network link fails completely, the uncorrupted data is still present on the other link. Changeover in the event of the failure of a network link is automatic.

Streaming

Unicast

Unicast (one-to-one) is used in application scenarios such as an individual stream between two devices (e.g. a multi-channel stream between a console, a DAC and a recorder/DAW). This uses a point-to-point connection between the sender and receiver. Since each additional receiver adds its own individual connection network traffic increases with every additional unicast stream.

Multicast

Multicast (one-to-many) streaming is used in scenarios where a single source is to be distributed to many potential recipients (e.g. program stream to journalists' desktops). At the sending end this only requires one connection per stream. Network switches are aware which participants (receivers) should receive any particular multicast and forward packets only to registered nodes. In multicast set-ups the network traffic only increases on the last (closest to receiver node) segment(s) of the network path.

Infrastructure

The network infrastructure must be able to transport IP packets and must support a number of standard operating protocols, e.g. RTP/RTPC for streaming since this is used widely and supports a wide variety of standard pay-load formats. Some of these formats are mandatory for all RAVENNA devices, others are optional. For example this protocol offers the possibility of standard media player applications subscribing to RAVENNA streams. Synchronization across all nodes is achieved via the IEEE1588-2008 (PTPv2 Precision Time Protocol). This is another standard protocol which can be used on IP. PTPv2 provides a means for synchronizing local clocks to a precision as defined in AES-11. Accurate synchronization can even be achieved across WAN connections when GPS is used as a common time domain.

Quality of Service

For the QoS (Quality of Service) protocol DiffServ has been chosen since it is widely supported by most modern managed switches. Since other traffic can co-exist with RAVENNA on the same network, RAVENNA traffic must be on the fast track. RAVENNA packets are assigned a high priority classification to ensure expedited transport across the network, while other packets with lower priority are treated as best-effort traffic. Even within RAVENNA there are different priorities assigned to different classes of traffic. Synchronization is assigned the highest priority, immediately followed by any real-time media traffic, while control and configuration traffic will be on a lower priority level. Any non-RAVENNA traffic would receive the lowest (standard) priority and be treated as best-effort traffic. Performance and capacity scale with the capabilities of the underlying network architecture.

3 Merging NADAC RAVENNA ASIO Driver (PC)

Overview

The NADAC RAVENNA ASIO Driver is intended for owners of a NADAC who wish to work in ASIO RAVENNA mode.

Merging also provides the Merging Audio Device (**MAD**) to NADAC users requiring WDM Support and Multi-ASIO support. Refer to the Merging Audio Device (MAD) page for more details
https://www.merging.com/products/merging_audio_device
https://confluence.merging.com/pages/viewpage.action?pageId=70221956

ASIO

Steinberg's Audio Stream Input/Output (ASIO) provides audio stream connectivity between software applications and audio hardware on Windows.

System Requirements

Wintel platforms tend to increase in number of cores, speed and performance at a tremendous rate. New and faster processors are released almost on a monthly basis.

We maintain a list of up to date PC configurations in the Support Section of our website at:

http://www.merging.com/pages/pcconfig

Certified PC Operating Systems (OS)
We highly recommend installing the NADAC ASIO driver under Windows 7 Professional 64 bit or Windows 10 Professional 64 bit

> **Note:** Although not certified, it has also been observed to work under the Home editions of Windows 10 (64-bit) and Windows 7 (64-bit). The ASIO driver is NOT supported under XP, Vista and Windows 8.1 or any 32bit OS version.

Warning: NEVER attempt to install the Driver on Windows NT Server

The ASIO Driver has been tested and qualified on Windows 7 Professional 64 bit and Windows 10 Professional 64 bit

Notes

• The NADAC RAVENNA ASIO driver supports sampling rates starting from 44.1 kHz up to 384 kHz, DXD, DSD64, DSD128 or DSD256

• The ASIO Driver is not multi-client. I.e. it cannot be used with multiple applications at the same time. Only one application at a time can use the ASIO Driver on the same system.

• A separate sound card for other general work is recommend

Tips

• RAVENNA requires that the NADAC is connected to a Gigabit Ethernet port

• NADAC will follow the Sampling rate changes provided by the ASIO host

• We strongly recommend users to disable their Antivirus and Windows Public Firewal

> **Note:** The Merging MassCore PCIe Ethernet card NET-MSC-GBEX1 cannot be used with the NADAC RAVENNA ASIO driver since it is specific to MassCore. A Merging Technologies NET-INT-GBEX1 card is available for users needing a PCIe Ethernet Gigabit Adapter card. Please contact your Merging Technologies Sales Partner for details.
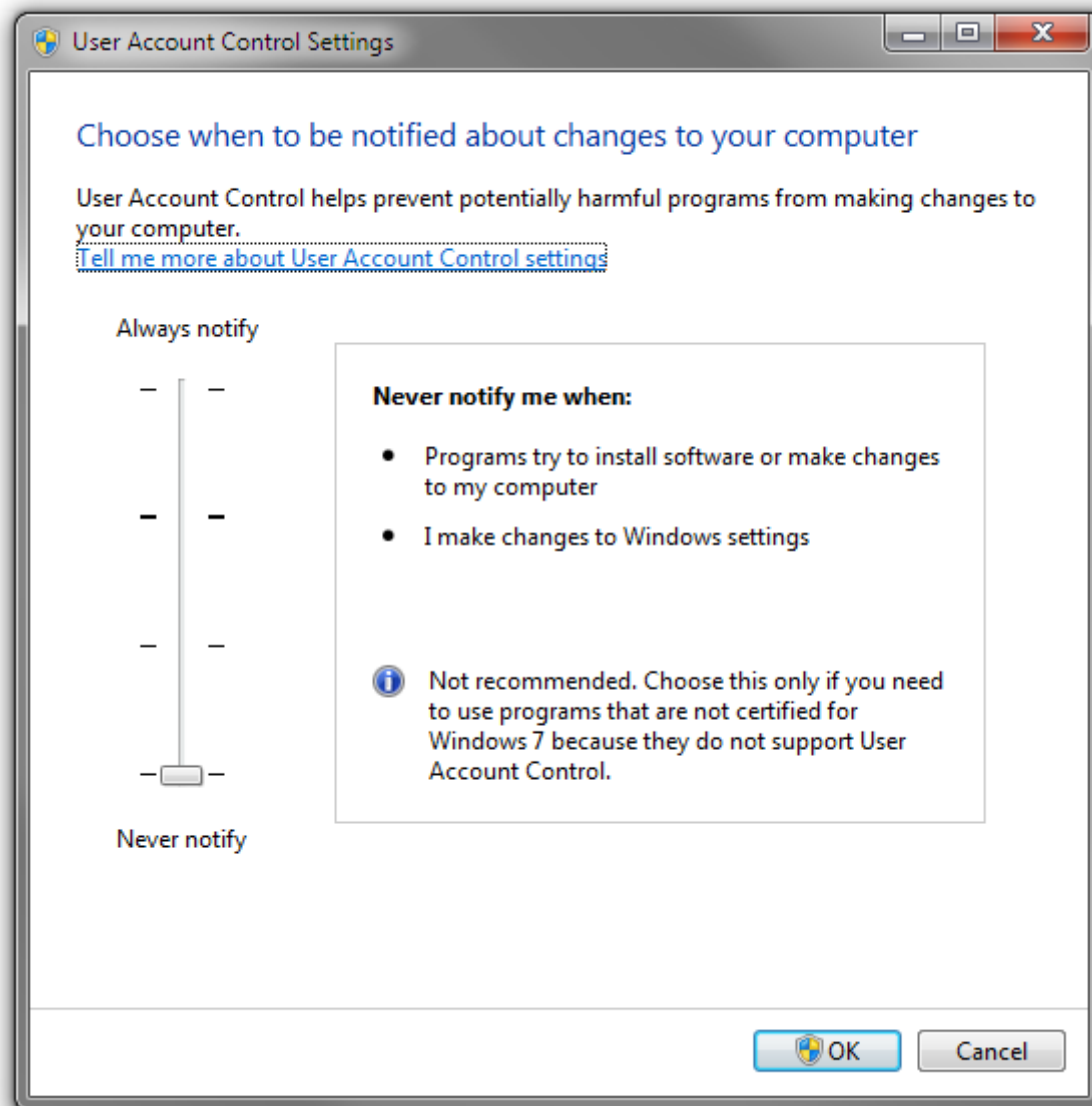
Installing the RAVENNA ASIO Driver

Prerequisites
The Merging NADAC RAVENNA ASIO Driver can be installed on PC systems running Windows 7 -SP1 (64bit) or Windows 10 (64bit)

Installation Procedure
1. Disable Windows UAC. (User Account Control) Set it to **Never Notify** and restart the PC.

Windows User Account Control Settings

2. Users must disable their Windows Public Firewall and any Antivirus software then working in RAVENNA ASIO

3. Download the latest Merging RAVENNA ASIO Driver from:

    http://www.nadac.merging.com

    Note: The installer may warn of pending requirements (Bonjour & Microsoft Redistributable C++) Accept and proceed with these installations.

4. When installation is complete accept the software licence agreement

5. Restart the computer.

6. When the PC has rebooted open the NADAC RAVENNA ASIO Panel.
Windows Start Menu - All Programs > Merging Technologies > Merging Ravenna ASIO Driver > NADAC.Panel
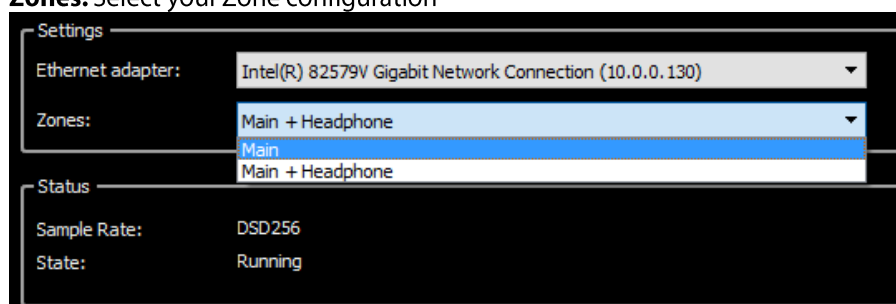

8. Configure Merging RAVENNA ASIO Settings:

Settings:
- **Ethernet adapter:** Lists all available network ports. Select the network port the NADAC is connected to.

- **Zones:** Select your Zone configuration

Two Zones are available:
- Main: Provides one zone of 8 channels outputs that is meant to be connected to the NADAC Main output (being NADAC 8CH or 2CH)
- Main + Headphones: Provides two zone that can be connected by both the NADAC Main and NADAC Headphone separately, it is under the responsibility of the application using the Driver to manage two Zones or playlist and send two set of audio to those two Zones.

Status:

- **Sample Rate:** Shows the current Driver Sampling Rate
- **State:** Shows the connected ASIO Host or warn user if no ASIO Host is connected

Online RAVENNA Devices:

- Your NADAC will appear in the online devices when properly connected
- Mouse clicking on the NADAC icon will open the NADAC app which allows some remote control functions
- Leaving you mouse over the NADAC icon will give you the addressing details

Warning: If your NADAC icon is as such *it indicates that your MERGING+NADAC cannot be reached.*
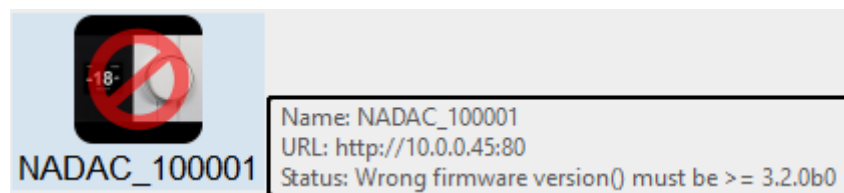

Clicking on the NADAC icon will give you the status error at cause

Example: Not Reachable. Verify your set up connections and reboot your MERGING+NADAC
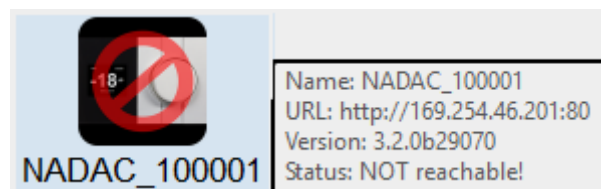
Example: Wrong Firmware version. Please contact your Merging Sales Partners as you will need restart NADAC in maintenance mode and update your Firmware.

9. Ensure that the NADAC is connected to a Gigabit Ethernet port and launch your Player application

10. Select the NADAC ASIO driver within the application you will use it with

Note: some application such as JRiver will load the ASIO driver when the playback is started, in such case only will the Audio Sources within the NADAC OLED screen be available for connection.

Once your Driver is configured and the ASIO driver running connect the Audio Sources within the NADAC OLED screen
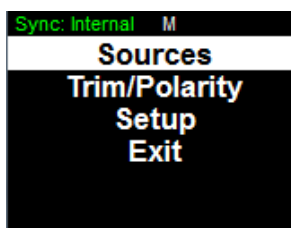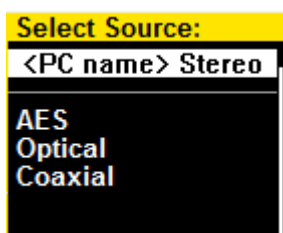
11. Go to the NADAC OLED display
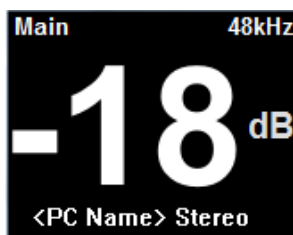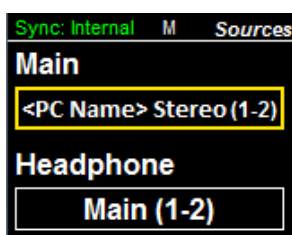

12. Long Push the NADAC Rotary button

13. Select Sources Menu

14. Select an Output Source

15. The Source will then be selected as such and you should be able to monitor your source/player.

Note: If the source is written in Red this would indicate that the Source is not valid.
Please verify your connections and configuration in such cases

Bundled Applications and Documentation

Additional applications and documentation are installed with the Merging NADAC RAVENNA ASIO drivers. Look in the Windows Start menu - All Programs > Merging Technologies > to find the entries below:

>Documentation

The folder contains documentation on all applications and utilities.

> MTDiscovery

MT Discovery is a standalone application that searches your network for Bonjour Services. It allows quick and easy access to Merging's Web Services based on Bonjour, such as the NADAC remote access pages. These pages will open in your computer's default browser.
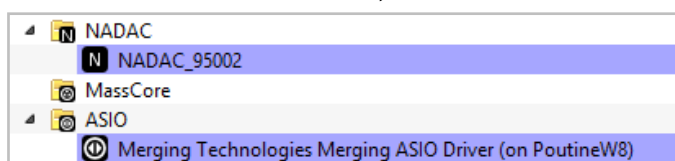
The MT Discovery application window displays a tree view of all the devices it finds on the Bonjour Network. It refreshes automatically when a device is connected or disconnected.
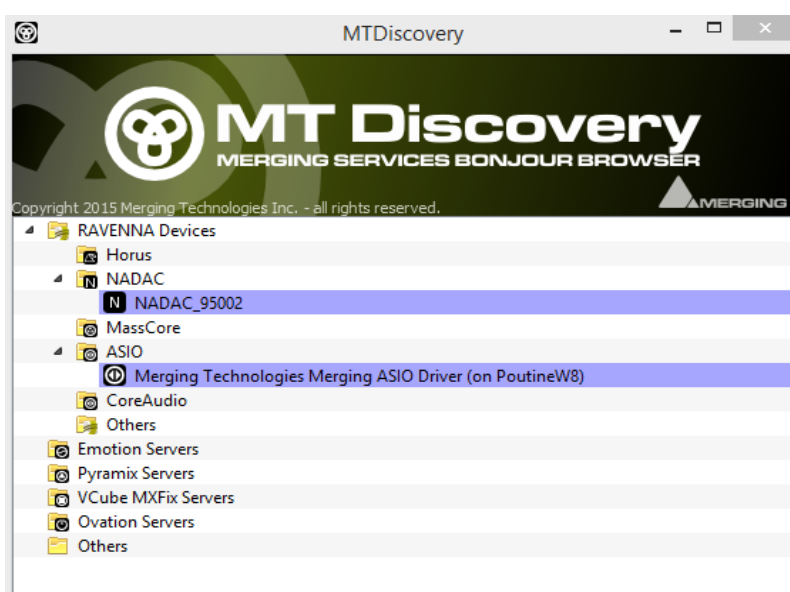
Color Coding

The color of RAVENNA Device entries indicates the network they are on. Same color = same network.
Note: NADAC and the Driver entry must be the same color in order to work together in RAVENNA mode.

Actions

Right-clicking (Ctrl+click on Mac) on an item on the tree view displays a contextual menu, which lists the actions available for the item.

Open

Open is what you will want to do most of the time. It will show the main page of the device in your computer's default web browser. This can also be achieved by double-clicking on a device, or by hitting Enter when the device is selected.

Open Advanced

Open Advanced will attempt to display the main settings page of the device in the computer's default web browser. This can also be achieved by holding down Ctrl (Cmd on Mac) and double-clicking on a device, or by hitting Ctrl + Enter (Cmd + Enter on Mac) when the device is selected.

Troubleshooting

Firewall and Antivirus

Windows Firewall

The Windows Firewall can block communication between MassCore and NADAC. As mentioned in the install procedure we recommend disabling the Public Network Firewall

Procedure

1. Go to **Windows Control Panel > Windows Firewall**.

2. Click on **Turn Windows Firewall on or off**

3. Go to the **Public Network** section and select **Turn Off Windows Firewall**

Antivirus

Merging also recommends disabling their Antivirus, as mentioned in the install procedure. Some Antivirus software such as Avast have been known to block the NADAC discovery and RAVENNA I/O Connections.

NADAC Firmware update:
If you need to update your NADAC's firmware:
https://confluence.merging.com/display/PUBLICDOC/NADAC+Firmware+Update+Procedure

Refer to the Support NADAC Space for more troubleshooting information
https://confluence.merging.com/display/PUBLICDOC/NADAC+space

4 Merging RAVENNA Core Audio Driver (Mac)

Overview

The Merging NADAC RAVENNA CoreAudio Driver is intended for owners of a NADAC using Mac OS X who wish to work in RAVENNA CoreAudio mode.

Core Audio

Apple's CoreAudio is a standardized audio driver system for all Macintosh computers running Mac OS X.

CoreAudio is an integral part of Mac OS X, allowing access to all Core Audio compatible audio interfaces.
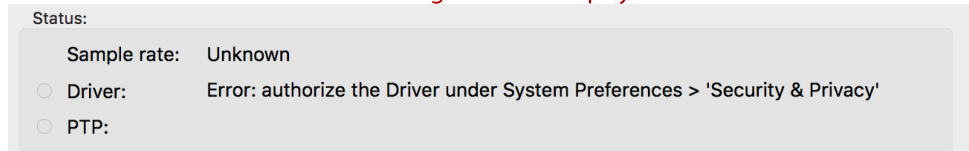
System Requirements

Certified MAC Operating Systems (OS)

Certified MAC Operating Systems (OS) The Core Audio driver is qualified under Mac OS:

- X Yosemite v10.10.5 : RAVENNA Core Audio version 2.0.31254.dmg
- El Capitan v10.11.x : RAVENNA Core Audio version 2.0.31254.dmg
- Sierra 10.12.x : RAVENNA Core Audio version 2.0.31254.dmg and higher
- High Sierra 10.13.x : RAVENNA Core Audio version 2.0.37039.dmg and higher
- Mojave 10.14.1 to 10.14.4: RAVENNA Core Audio version v2.0.36877.dmg and higher
- Mojave 10.14.5 and 10.14.6: RAVENNA Core Audio version 2.1.41964 dmg and higher
- Catalina 10.15.1 and 10.15.2: RAVENNA Core Audio version 2.1.41964 dmg and higher
- Catalina 10.15.3 to 10.15.7 RAVENNA Core Audio version 2.1.45186 and higher
  Warning: MacOS Big Sur and New Mac Silicon M! processors not supported

- IMPORTANT:
  If the Driver is not well authorized a warning should be displayed in the NADAC Core Audio Panel

Status:	
Sample rate:	Unknown
○ Driver:	Error: authorize the Driver under System Preferences > 'Security & Privacy'
○ PTP:	

  macOS High Sierra 10.13.X , Mojave 10.14.X and Catalina 10.15.X might 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.

Notes
- The RAVENNA Core Audio driver supports sampling rates from 44.1Khz up to 8fs - 352.8 kHz – 384 kHz - DSD64 – DSD128 – DSD256*.
  * support DSD256 DoP1.1 with Audirvana 2.2.4.3 and higher

- The driver can be used as default device and System (alert) device.

mac OS configuration Guidelines.

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

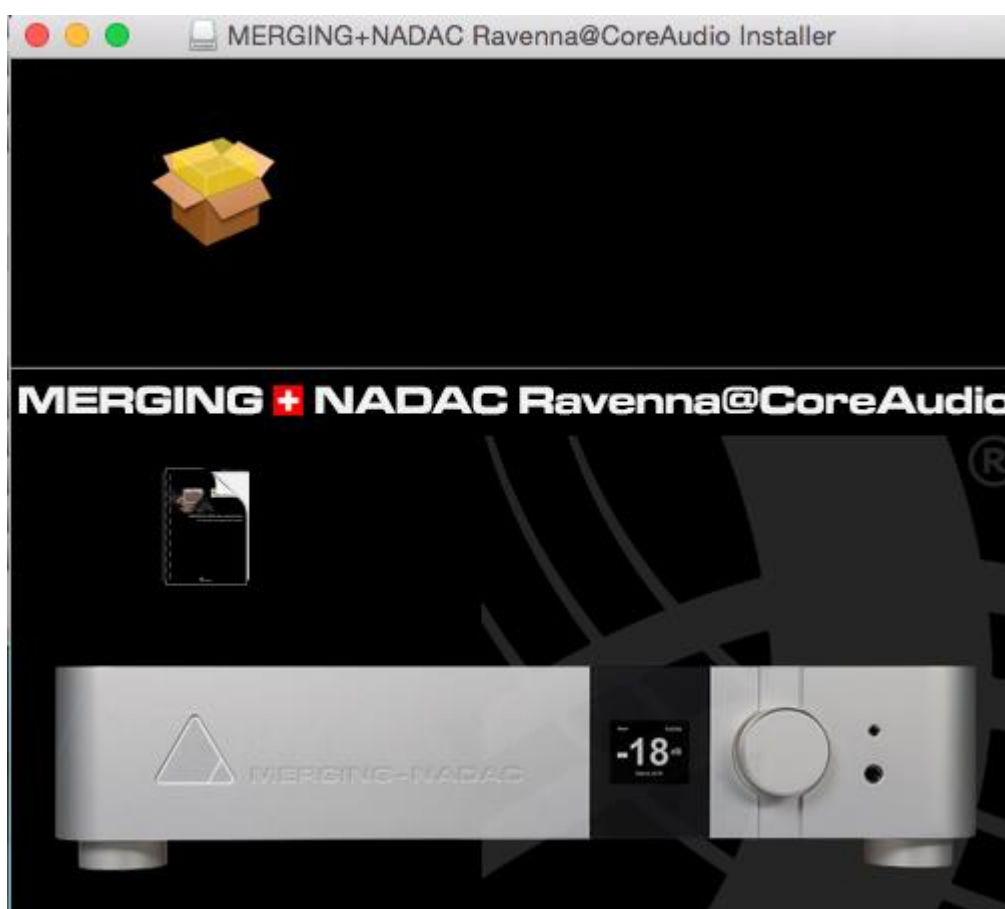## Installing the Merging RAVENNA CoreAudio Driver

Prerequisites

The Merging RAVENNA Core Audio Driver can be installed as a stand-alone driver

OS

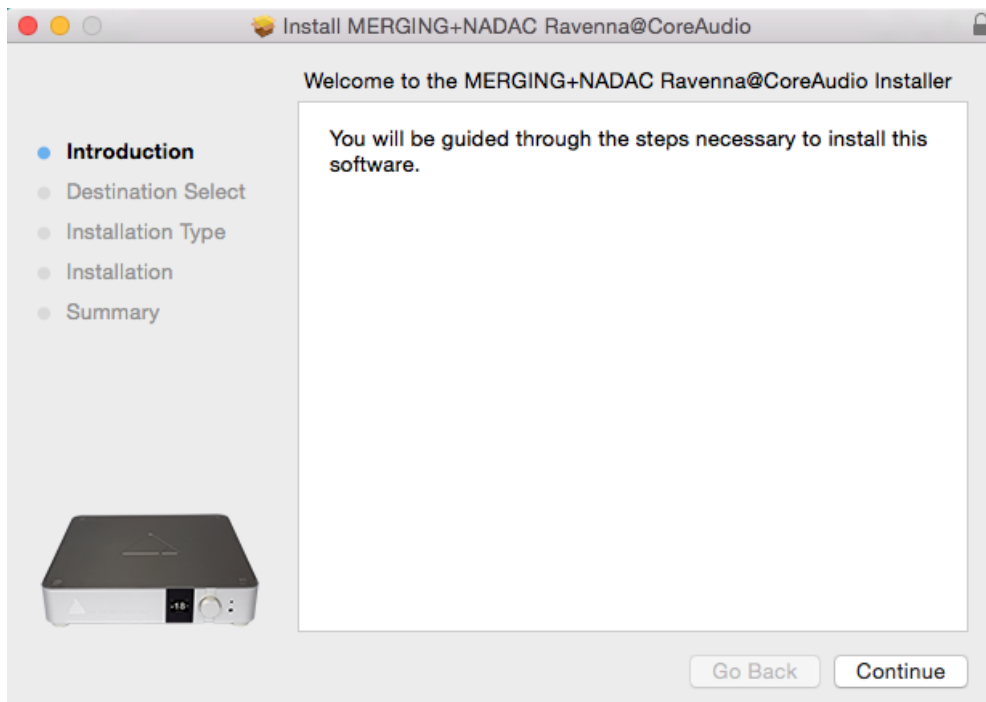Refer to system requirements above

Installation Procedure

1. Download the NADAC RAVENNA Core Audio Installer for MAC.

http://www.nadac.merging.com

2. Open the **Merging NADAC RAVENNA Core Audio Installer .dmg** file.

Mac Desktop with installer selected

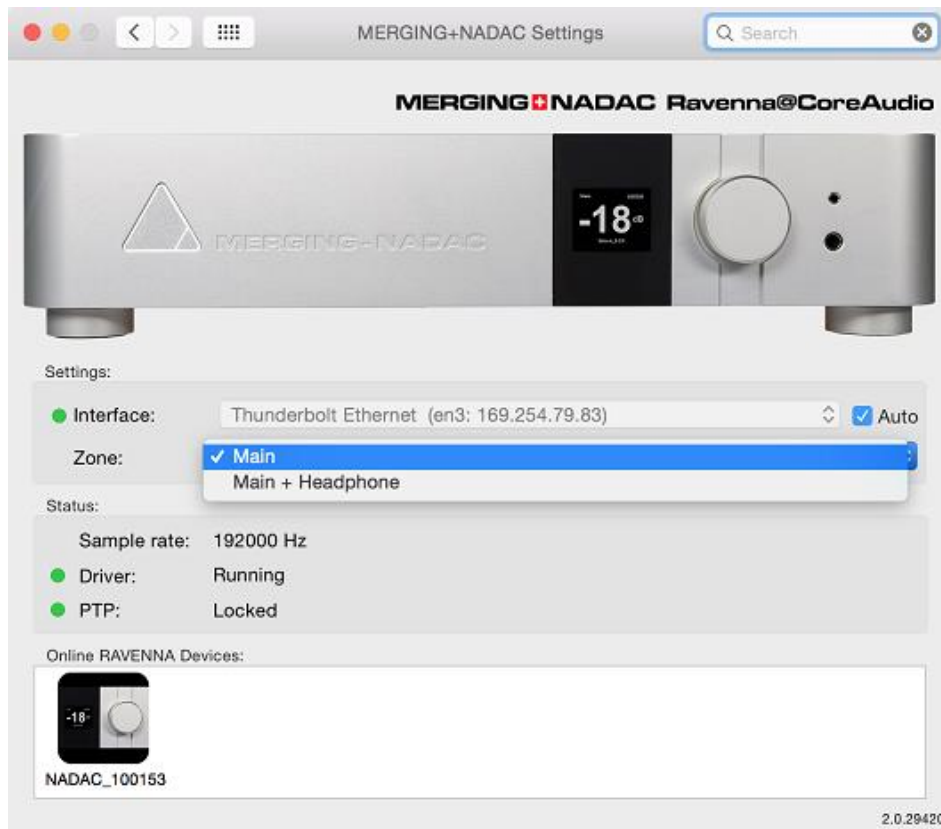3. Click on **Continue** to proceed with the installation.

4. Follow the installer instructions. You will be prompted to enter the Administrator password

5. When the install is complete it will display **Successful**. Click **Close** to exit.

6. Restart the MAC after the driver installation is completed.

7. Go into **MAC System Preferences**, in **Other** open the **NADAC** icon.
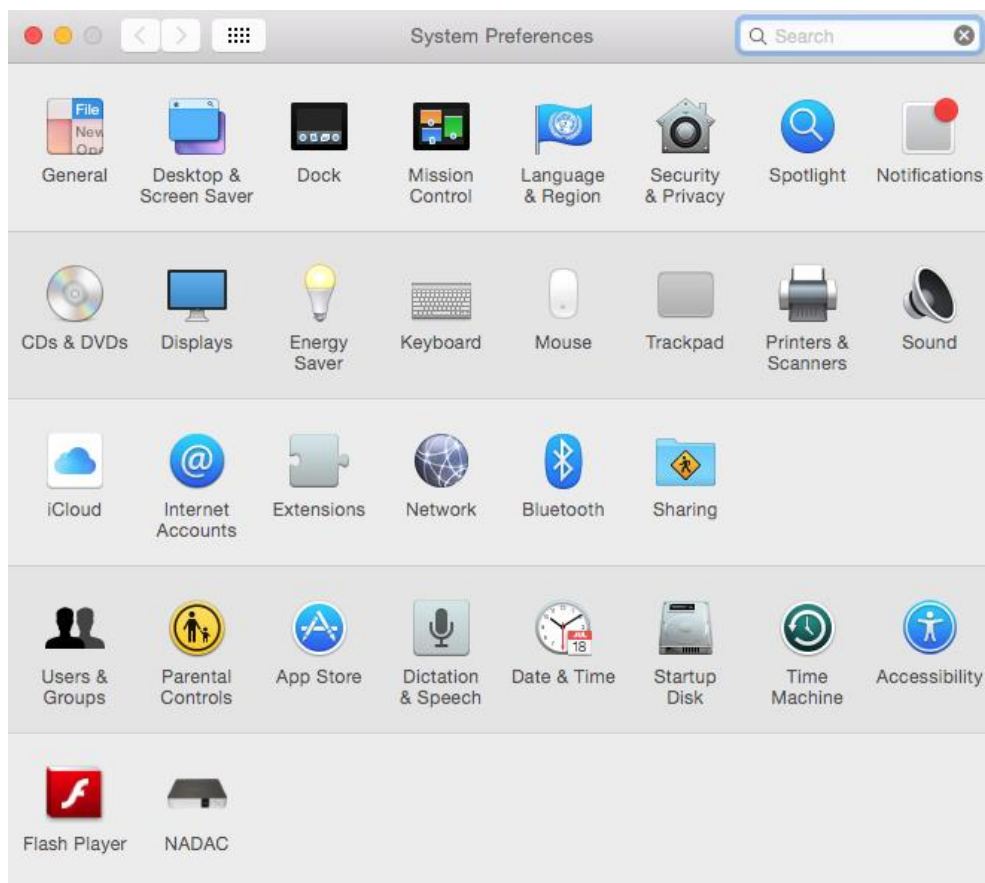
8. Configure the NADAC RAVENNA CoreAudio Settings:

- **Interface:** - lists all available network ports. Select the network port on which the NADAC is connected to.
  - gray: no interface or interface not properly configured
  - green: interface at 1Gb
  - yellow: interface at 100Mb

- **Zones:** Two Zones are available:
  - Main: Provides one zone of 8 channels outputs that is meant to be connected to the NADAC Main output (being NADAC 8CH or 2CH)
  - Main + Headphones: Provides two zone that can be connected by both the NADAC Main and NADAC Headphone separately, it is under the responsibility of the application using the Driver to manage two Zones or playlist and send two set of audio to those two Zones.
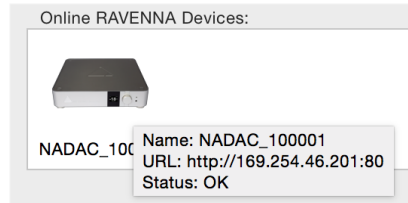
Status

- **Sample Rate:** Shows the current Driver Sampling Rate
- **Driver:**
  - Red: no NADAC available on the network (verify your Ethernet port connection)
  - Green: Running properly
- **PTP:**
  - Green: PTP locked
  - Yellow: PTP locking
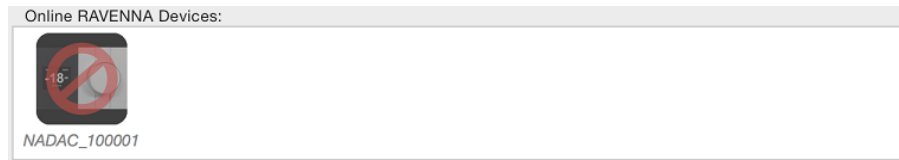 - Red blinking: PTP unlocked

Online RAVENNA Devices

- The online RAVENNA Device will be discovered if properly connected
- Leaving you mouse over the NADAC icon will give you the addressing details
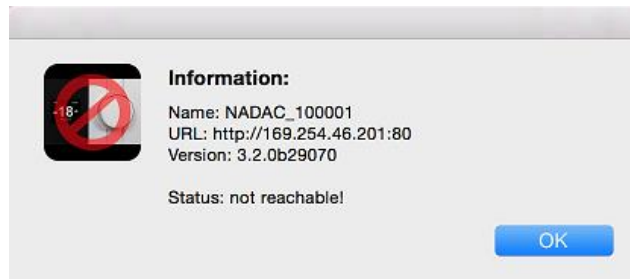

Warning: If your NADAC icon is as such *it indicates that your MERGING+NADAC cannot be reached.*

*Clicking on the NADAC icon will give you the status error at cause*

Example: Not Reachable. Verify your set up connections and reboot your MERGING+NADAC

Example: Wrong Firmware version. Please contact your Merging Sales Partners as you will need restart NADAC in maintenance mode and update your Firmware.

- Mouse clicking on the NADAC icon will open the NADAC app which allow some remote control functions
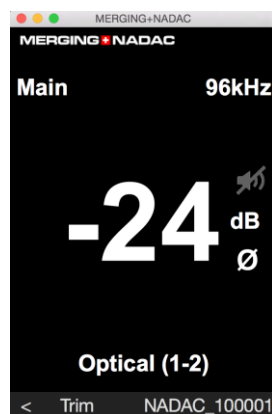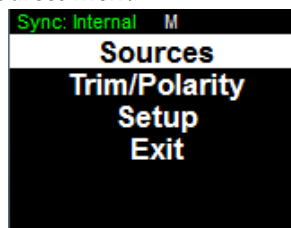
9. Configure the application you wish to use so that the I/O connections use the Merging NADAC Core- Audio Driver.
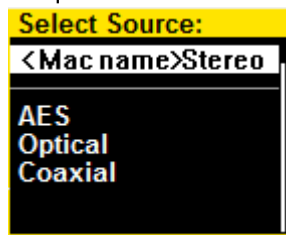
10. Go to the NADAC OLED display

11. Long Push the NADAC Rotary button

12. Select Sources Menu

13. Select an Output Source

14. The Source will then be selected as such and you should be able to monitor your source/player.
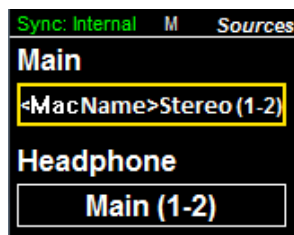
Note: If the source is written in Red this would indicate that the Source is not valid.
Please verify your connections and configuration in such cases

Core Audio Speaker Configuration:

The NADAC Core Audio Driver allow you to configure your Speaker set

Procedure:

- Open the MAC Audio MIDI Setup and select the

- Select Merging + NADAC

- Select the Configure Speakers option and the lower right of the dialog

- Configure your Stereo or MultiChannel Speaker set

Mac OS recommended configuration

Configure Energy Saver Parameters
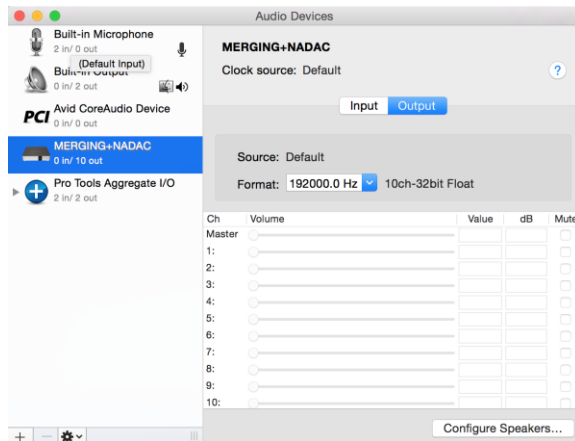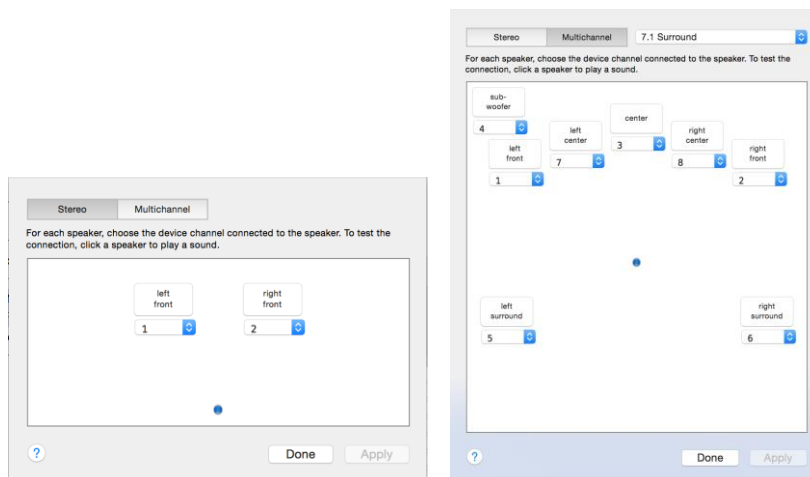
1. Open System Preferences
2. Click 'Energy Saver'.
3. Disable the Automatic Graphic Switching option
   Do one of the following (available option depends on your computer model).
4. If present, set the 'Computer sleep' slider to 'Never'
   Otherwise, check the box that says 'Prevent computer from sleeping automatically when the display is off.'
5. Un-check the box for 'Put hard disks to sleep when possible'.
6. Un-check the box for 'Enable Power Nap'

Disable FileVault protection
This optimization will allow your hard drive to work more efficiently.

1. Open System Preferences.
2. Click 'Security & Privacy'.
3. Click on the 'FileVault' tab.
4. In this window find where it states: 'FileVault protection is (on/off) for the hard disk...'.
   If FileVault is on, click the button to 'Turn Off FileVault'.

Disable Gatekeeper

The Gatekeeper feature on macOS keeps your Mac safe from installing software from third-party developers. When installing trusted drivers or DAW software/updates, allow them access to macOS. You can also allow access after installation by going to the *General* menu within *Security & Privacy*. Learn more from Apple about how to safely open apps on your Mac.

- In the General menu, for *"Allow apps downloaded from:"* select **App Store and identified developers**.
- In the General menu, immediately after installing an audio or MIDI driver, click **Allow** to unblock the software from loading.
- In the FileVault menu, turn off **FileVault**. If turned on, user your iCloud account or recovery key to turn it off.
- In the Firewall menu, turn off the **Firewall**.
- In the Privacy menu, under **Location Services**, disable **Location Services**.
- In the Privacy menu, under **Analytics**, uncheck **Share Mac Analytics** and **Share with App Developers.**
- In the Privacy menu, under **Microphone**, check all apps *(DAWs, anything that uses your audio devices)* that you want to record audio with.
- In the Privacy menu, under **Accessibility**, check iLok and all other necessary audio or licensing apps.

Optimize Energy Saver
This optimization will free up system resources as well as prevent the computer from going to sleep or standby mode which can cause audio dropouts with software and hardware.

- Uncheck *"Automatic graphics switching"*.
- Move the slider to **Never** for *"Turn display off after:"*
- Check *"Prevent computer from sleeping automatically when the display is off"*.
- Uncheck *"Put hard disks to sleep when possible"*.
- Uncheck *"Wake for network access"*.
- Uncheck *"Start up automatically after a power failure"*.

▪ Uncheck *"Enable Power Nap"*.

Disable Automatic Updates

1. Open System Preferences.
2. Click 'App Store'.
3. Make sure the box labeled 'Automatically check for updates' is unchecked

Disable App Nap for Roon
App Nap can negatively affect Roon.
1. Go to your Applications folder.
2. Select the Roon application
3. Right-click or control+click the Roon application
4. Choose Get Info
5. In the Roon Info window, under General, you will see an option to prevent App Nap, disable this checkbox.

Disable the Mac Parental Control
1. Choose Apple menu > System Preferences, then click Parental Controls.
Note: When you open Parental Controls preferences, if you see the message "There are no user accounts to manage," see Add a managed user.
2. Click the lock icon to unlock it, then enter an administrator name and password.
3. Then Disable Parental Controls.

Uninstalling the Merging NADAC RAVENNA CoreAudio Driver

Merging/RAVENNA CoreAudio Driver Uninstaller
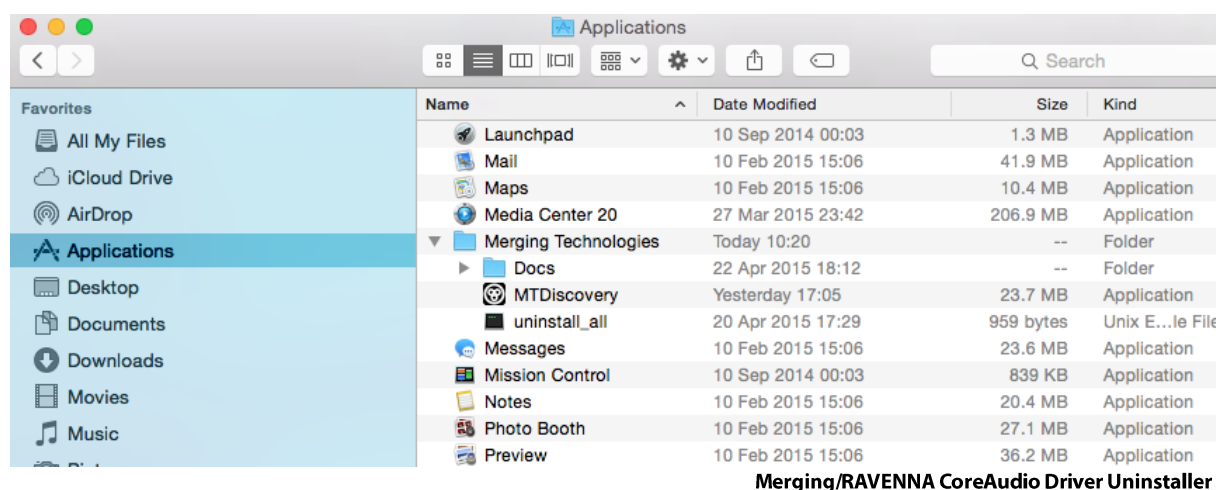
Use the uninstaller to remove the Merging NADAC RAVENNA Core Audio driver installation cleanly.

Bundled Applications and Documentation

Additional applications and documentations are installed along with the RAVENNA Core Audio installer. Look under **Places** to find all the necessary tools and information in order to work in RAVENNA mode.

MTDiscovery

MT Discovery is a standalone application that searches your network for Bonjour Services. It allows quick and easy access to Merging's Web Services based on Bonjour, such as the NADAC configuration page. These pages will open in your computer's default browser.

Users can also use MT Discovery for NADAC remote access and in order to update the NADAC Firmware.
Please see: MT Discovery on page 37

Uninstaller

Use the uninstaller to remove the Merging RAVENNA Core Audio driver installation cleanly.

Documentation

Here you will find relevant documentation on all applications and utilities.

Apple Store App

A NADAC app will shortly be available for free on the Apple App Store

Troubleshooting

NADAC RAVENNA Core Audio Settings

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

> **Note:** When the NADAC 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 Player or depending on the speed of the processor. To avoid this problem adjust the Buffer size. You should aim for the lowest possible I/O buffer size value that doesn't introduce clicks, pops, and crackles in the audio.

Security Firewall

The Mac Firewall can block communication between RAVENNA and NADAC.

Mac Security panel - Firewall Tab

Recommendation: Disable by switching it **Off**

NADAC Firmware update:

If you need to update your NADAC's firmware:
https://confluence.merging.com/display/PUBLICDOC/NADAC+Firmware+Update+Procedure

Refer to the Support NADAC Space for more troubleshooting information
https://confluence.merging.com/display/PUBLICDOC/NADAC+space

5 General Troubleshooting

RAVENNA: NADAC & Network configuration

1. First check the IP address of the NADAC device in **Setup page > Network**
    To be able to see each other, the Ethernet port and the NADAC must be in the same range of addresses.
    (for example 169.254.xx.xx).

2. The NADAC IP address can be set and checked in the NADAC **Setup page > Network**.

    Note: Some laptops require an Ethernet card driver update (2012) in order to work with NADAC/RAVENNA in certain address ranges.

Working With Multiple NADAC Over a Network

Please refer to the RAVENNA Network Guide (for Merging Technologies Products) for all details about configuration and setup.

Connections:

If you cannot connect a Player Sources with your NADAC make sure that you have the latest NADAC Firmware and the latest RAVENNA ASIO or Core Audio driver.

MERGING+PLAYER users should not be running in fixed IP mode, we recommend that you leave the MERGING+PLAYER Network page configuration setting to "Auto" IP mode.

Mac – High Sierra & Mojave:

Under macOS High Sierra or Mojave it is important that you 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".
If the Driver is not well authorized a warning should be displayed on the NADAC Core Audio Panel.

One other way to find out is by following the procedure below.
1. Open a Mac Terminal
2. Type kextstat | grep -v com.apple   and enter
3. If you see the entry .com.merging.audio.MergingRAVENNAAudioDriver listed there than it should be well authorized.

Example in image.

Refer to the Support NADAC Space for more troubleshooting information
https://confluence.merging.com/display/PUBLICDOC/NADAC+space

6 MT Discovery

Overview

MT Discovery is a standalone application that searches your network(s) for Bonjour Services. It enables quick and easy access to Merging Technologies Web Services based on Bonjour, such as the NADAC configuration page. These pages will be open in your computer's default browser. MT Discovery can be used to update the NADAC Firmware. Please refer to the NADAC User Manual for detailed information about this procedure.

> **Note:** The default web browser is determined by a computer setting, not from MTDiscovery. It will most probably be one of the following applications:

- Microsoft Internet Explorer
- Apple Safari
- Mozilla Firefox
- Google Chrome.

Google Chrome or Apple Safari are recommended for use with Merging Technologies products.

Using MT Discovery

Note: The information in this chapter refers to Windows. Mac implementation is similar.
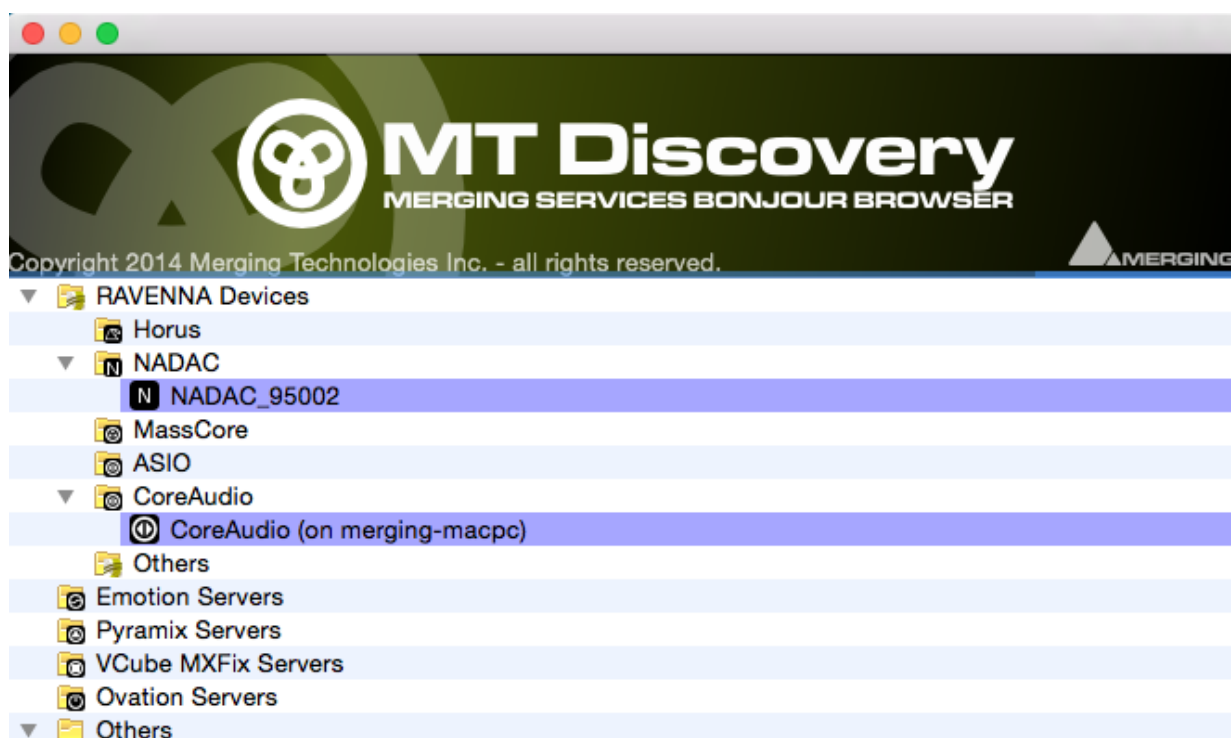
Launch MTDiscovery

Launch the MT Discovery application from the Windows Start Menu:

All Programs > Merging Technologies > MT Discovery

or by clicking on the desktop icon.

MT Discovery Window

The MT Discovery application window displays a tree view of all the devices it finds on the Bonjour Network. It refreshes automatically when a device is connected or disconnected.

Groups

MT Discovery will sort all devices into groups automatically (displayed like folders), depending on the characteristics of the devices.

The different groups are:

- **RAVENNA Devices**

This group contains devices which have the RAVENNA protocol enabled and sorts them into different subgroups:

- **NADAC**
- **Horus/Hapi**
- **MassCore**
- **Asio/Core Audio**
- **Other RAVENNA**

- **Servers**

  - **Emotion Servers**

  - **Pyramix Servers**

  - **VCube MXFix Servers**

  - **Ovation Servers**

  - **Others**

The **Others** group contains all Bonjour devices that could not be identified by MT Discovery. Printers are likely to be found in here.

> **Note:** The number in brackets near a collapsed folder indicates how many devices this folder contains.

Actions
Right-clicking (**Ctrl+click** on Mac) on an item on the tree view displays a contextual menu, which lists the actions available for the item.

Open   Open is what you will want to do most of the time. It will show the main page of the device in your computer's default web browser. This can also be achieved by double-clicking on a device, or by hitting **Enter** when the device is selected.

Open Advanced   Open Advanced will attempt to display the main settings page of the device in the computer's default web browser. This can also be achieved by holding down **Ctrl** (**Cmd** on Mac) and double-clicking on a device, or by hitting **Ctrl + Enter** (**Cmd + Enter** on Mac) when the device is selected.

> **Note:** Some devices will not support this, and your web browser will report a **404 - page not found** error. In this case, we recommend you access the main page with command **Open**, described above, then browse to the setup page in your web browser directly.

Expand / Collapse   Only available for Groups, shows/hides the contents of a folder in the tree view. This can also be achieved by clicking on the **+/-** sign on the left side, or by double-clicking on the Group name.

Color Coding
The color of RAVENNA Device entries indicates the network they are on. Same color = same network.
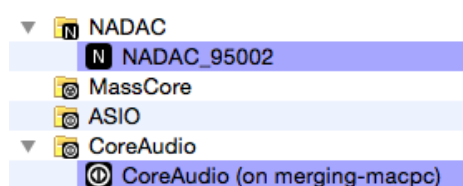
Device Network Color Coding

> **Note:** NADAC and Core Audio entries must be the same color in order to work together in RAVENNA mode.

Additional Information

The MT Discovery application is located in the following folder:

On Windows   **C:\Program Files\Merging Technologies\MTDiscovery**
On Mac   **TBA**
On Linux   **TBA**

7 Contacting Merging

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For all documentation inquiries or suggestions for improvement:
httpJ/www.merging.com

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