

AVB WITH MADLASER

**Control Laser through audio output
via AVB (and Dante) with MadMapper 5!**

Learn in this guide how to setup AVB,
the audio over ethernet protocol.

1. Introduction

- ▶ From version 5.1, **MadMapper** supports laser control through audio output via **AVB** (or Dante, but we'll focus on AVB in this guide), AVB being an audio over ethernet protocol. When using multiple devices, you'll need a compatible network switch which guarantees bandwidth per network connection. To output to AVB from a computer, you'll need an **AVB audio card**, like the RME Digiface AVB (macOS provides built-in support for AVB devices but it doesn't work with any network adapter and is less reliable, instructions: <https://support.apple.com/en-ae/guide/audio-midi-setup/amsavb001/mac>)

2. How does it work?

- ▶ Here's an example with an **RME Digiface** or another AVB audio card setup. To drive a laser, **MadLaser** generally sends network packets (or USB) to a DAC - a Digital To Analog converter - like an audio card is. **MadLaser** will send data for an "ILDA frame" (a list of xy positions & rgb levels) and the DAC will generate an electrical signal on 5 wires (x,y,r,g,b) varying the time of the frame. Generally those 5 electrical signals are transmitted through an ILDA cable, but some laser devices have an integrated DAC and will not require ILDA cable (LaserWorld with ShowNET, LaserCube wifi/ethernet). Those 5 electrical signals will go to the laser scanner (X & Y signals) and the laser diodes (R,G & B). With **AVB**, it is the same principle except that the x,y,r,g,b signals are not transmitted over the network from the computer, but to an **audio card**.

3. Pros & Cons

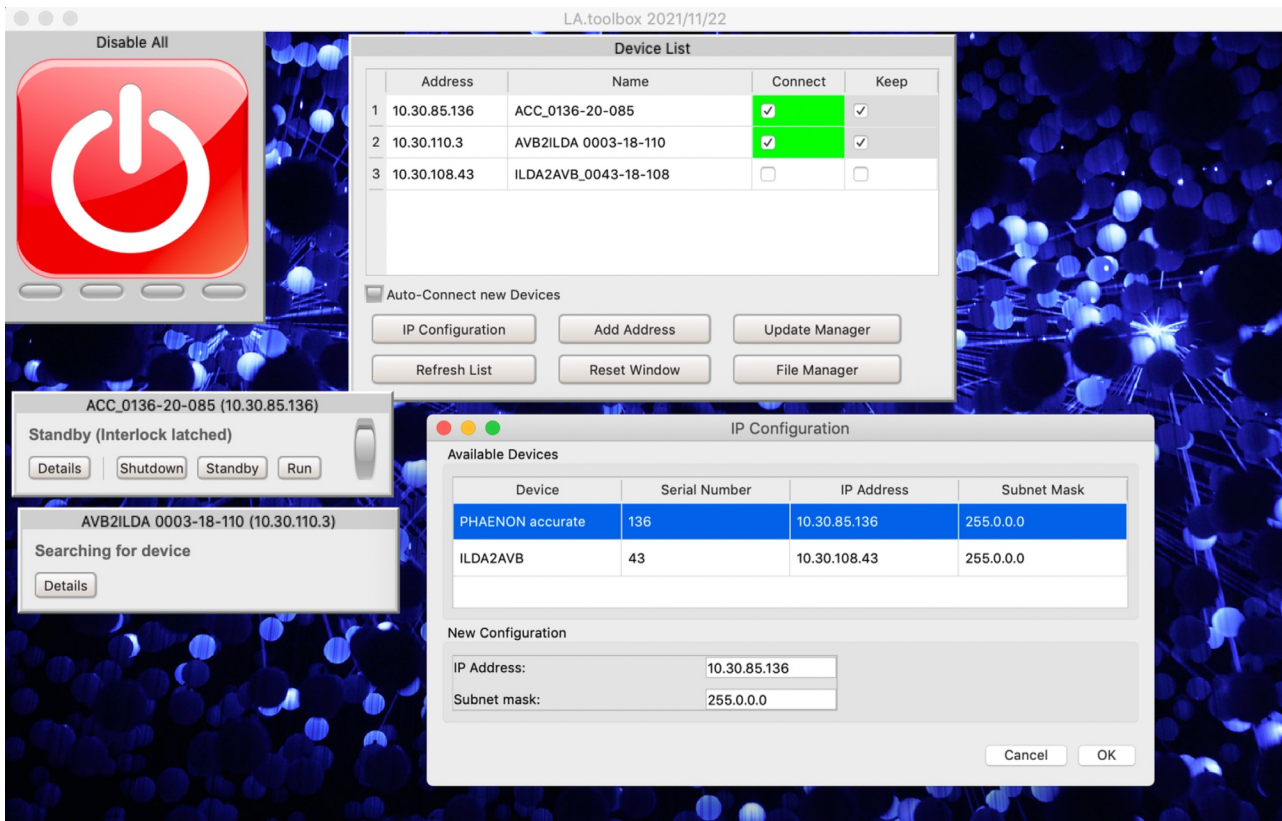
- ▶ The advantages are:
 - Once you made the setup, it is very reliable
 - You can theoretically go 192 kHz (192kpps), while this is mostly useless, neither the galvo motors or the laser diodes couldn't react so fast. But 96 kHz might be interesting for RGB. **MadLaser** let you access 48 kHz & 96 kHz.
 - Possible perfect synchronization of multiple devices
 - Security button to shut down
- ▶ The con is :
 - Setup is not that simple and require AVB network switch and AVB audio card, so more expansive than simple ILDA DAC like Etherdream, Helios, ShowNET, Moncha etc.

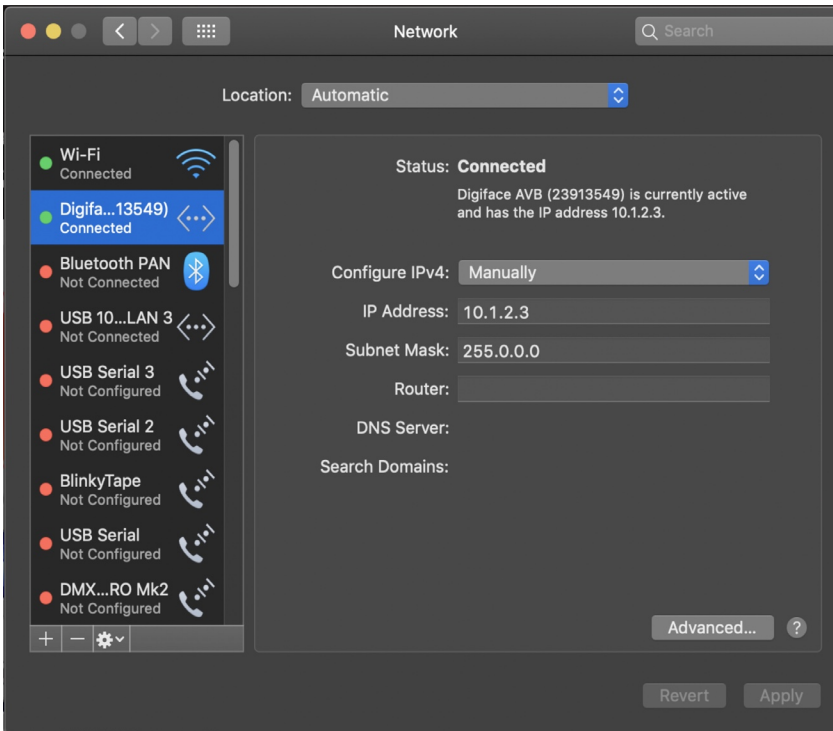
4. Laser Animation

- ▶ **AVB** support is mostly dedicated to Laser Animation laser projectors, which are high quality devices.
- ▶ First you'll need to install your audio device software & drivers.
For **RME Digiface AVB**: <https://www.rme-audio.de/digiface-avb.html>
+ **LA Toolbox**: <https://laseranimation.com/en/customer-area/laser-systems/latoolbox>

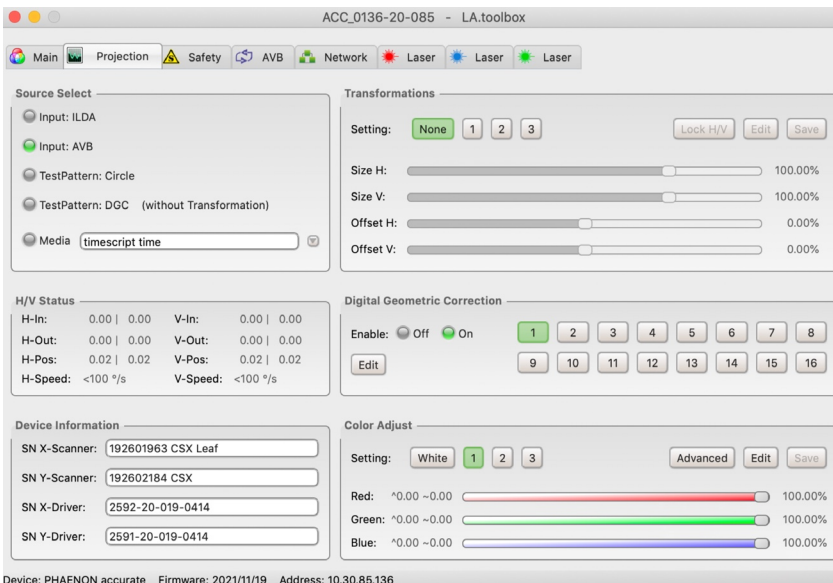
5. Setup

- ▶ When everything is installed (you should have rebooted your computer), start **LA Toolbox**. It should see the **Laser Animation** device (if it's not the case, refer to LA Toolbox documentation).
Select the device and press IP Configuration, you'll see the **AVB** devices have an IP address 10.xxx.xxx.xxx / 255.0.0.0.

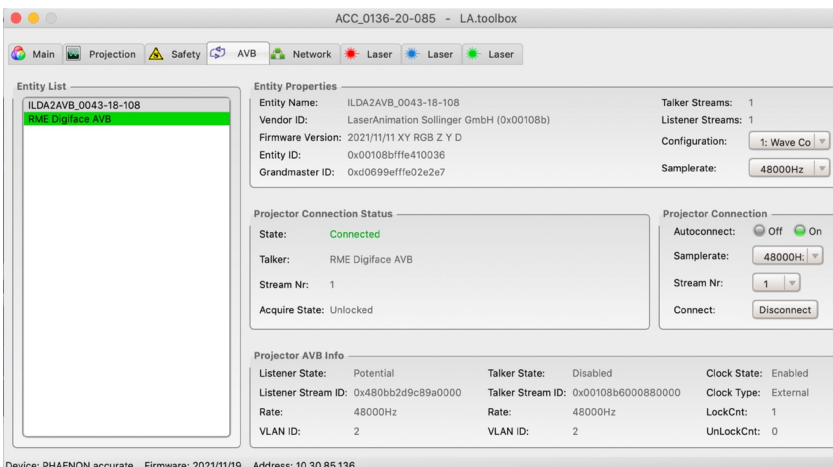




- ▶ On your computer you have a network interface corresponding to your audio interface, give it a static IP address in the same IP range (10.xxx.xxx.xxx / 255.0.0.0)



- ▶ In **LA Toolbox**, click on Details in the window corresponding to your laser projector and change Projection / Source Select to **AVB**.

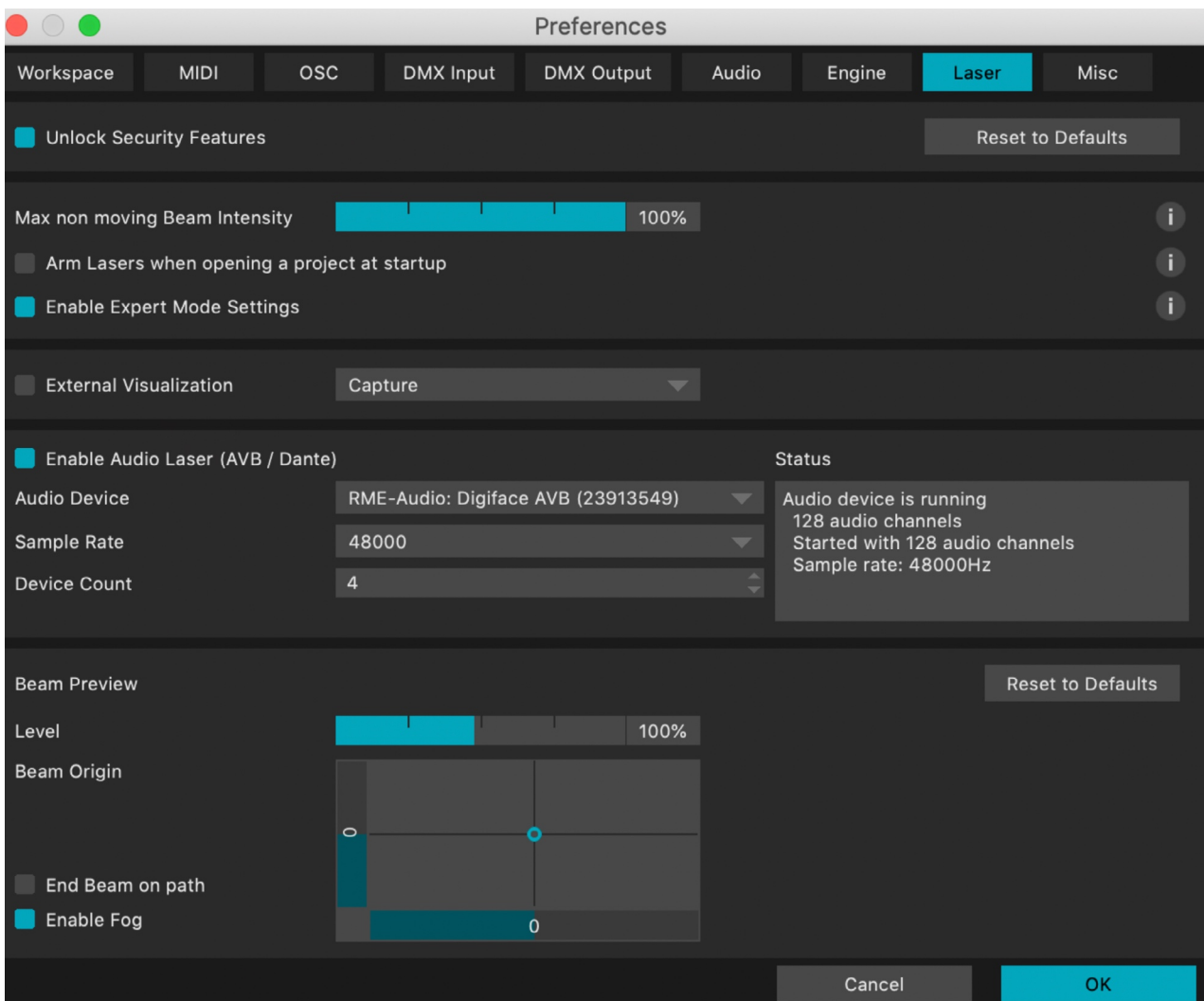


- ▶ In this **AVB** tab, be sure the audio sample rate is the same in the projector and in the audio stream.
- ▶ Press “**Connect**” button in Projector Connection.

6. MadMapper

6.1. Preferences

- ▶ Now you can start **MadMapper**, open Preferences / Laser and check the “Enable audio Laser (AVB/Dante)» option.
- ▶ On **Windows**, it will force MadMapper to switch audio driver type to ASIO and ask for an app restart. Then open Preferences / Laser again.



Laser tips

Be sure to select the same sample rate as in AVB / laser projector. You can choose the number of devices you want to create to drive multiple lasers with the “Device Count” setting.

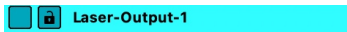
6.2. MadLaser Destination



- ▶ Go to the Projectos tab Surfaces located between the MadLight and Modules tabs.



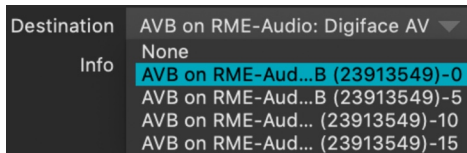
- ▶ Add a Laser projector by clicking on the second icon on the left.



- ▶ Once added your Laser projector will be displayed and named «Laser-Output-1» by default.

Laser tips

As for video projectors, laser projectors will be listed in the projectors list and you can rename them, display or undisplay them, lock them or unlock them at any time.



- ▶ Below, in the Projector inspector, AVB devices now appear as destinations in your laser output settings.

Download the latest **MadMapper** version, access to online resources, manage your license(s) and more on <https://madmapper.com> !