planetRing
INFO GUIDE

planetRing-dmx stepper v3.0

Silovsky Studios 2021

Planet/Ring Stepper Motor Control System with DMX512 & LED Control via Artnet

Software: Isadora 3.0 and Madmapper

info guide, code, hardware and controller system design
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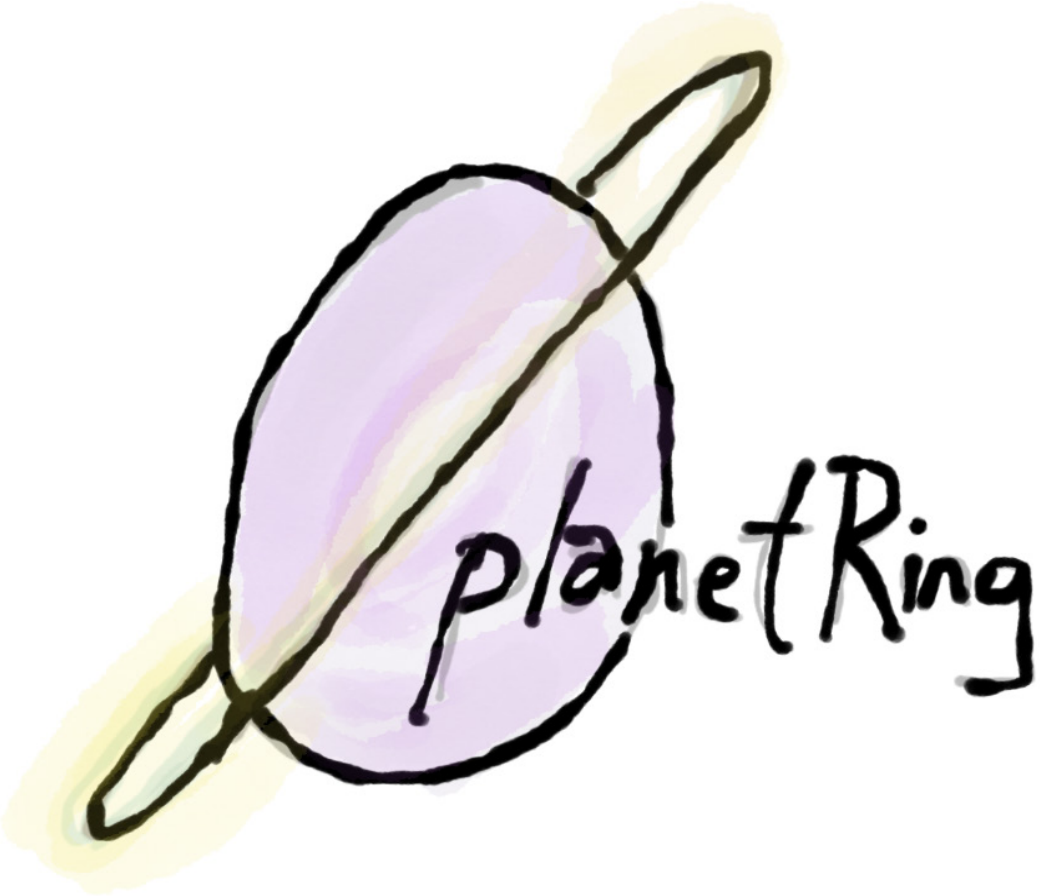
ryan.local@gmail.com



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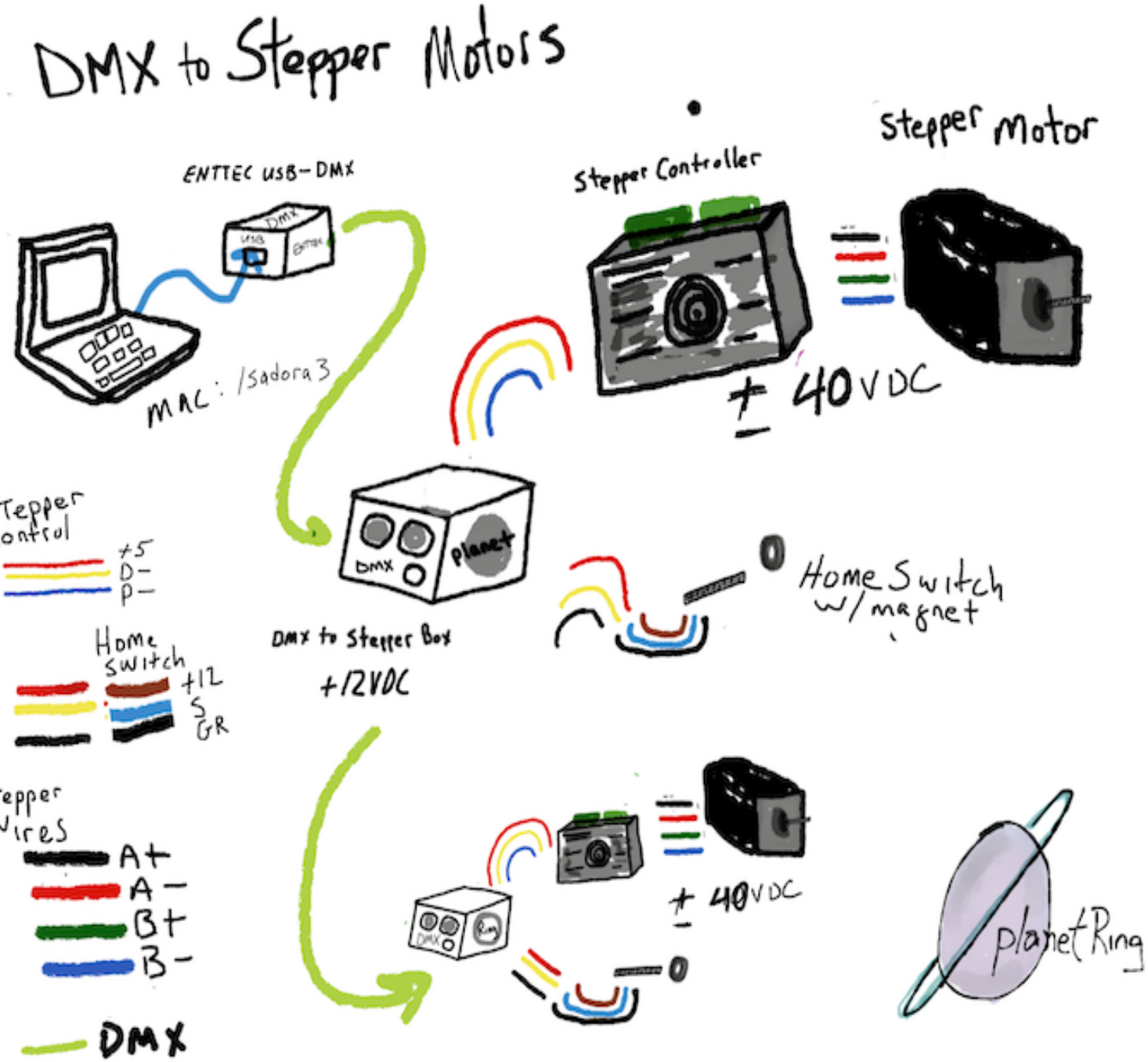
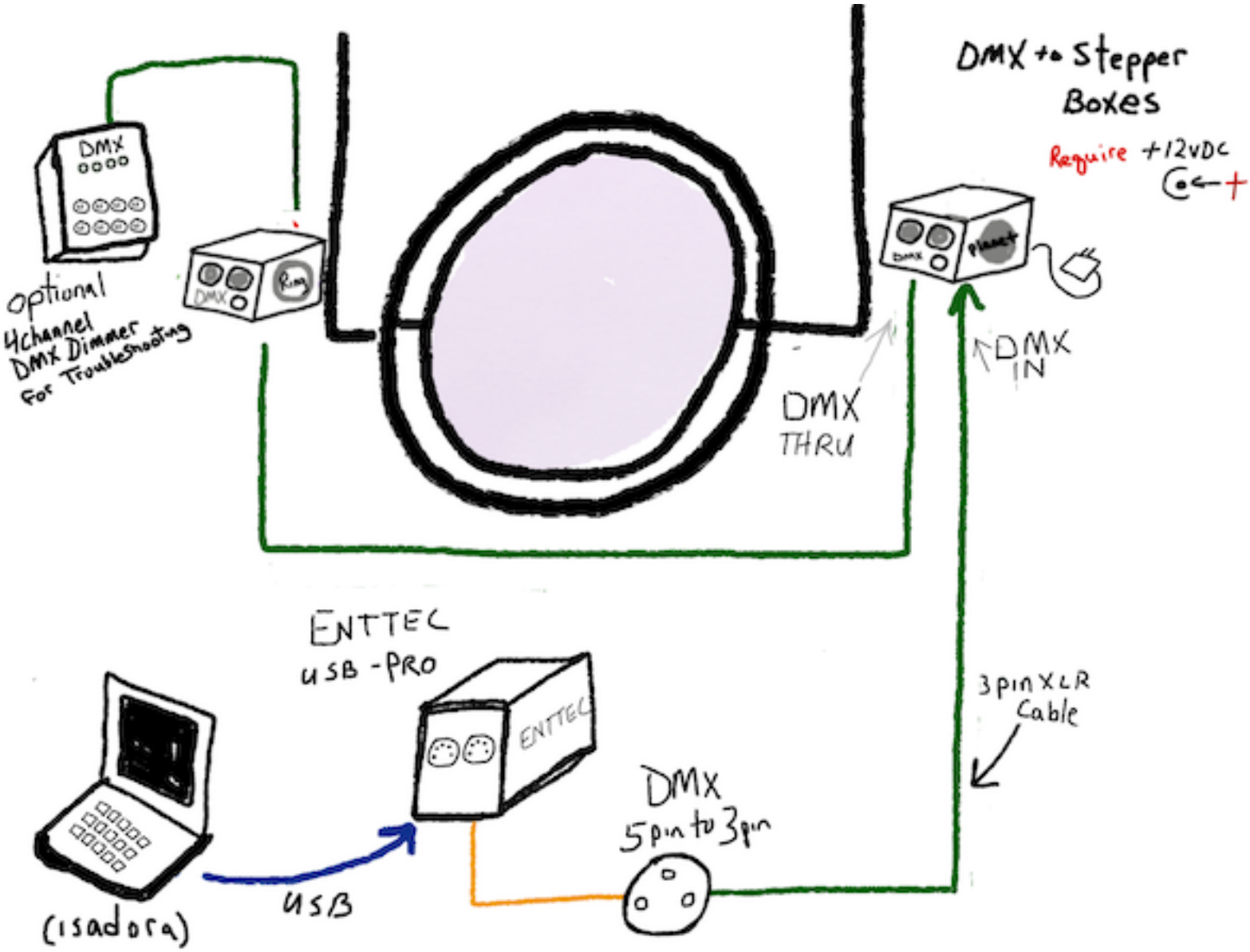


Stepper Motor Control with DMX
DMX wiring diagram



Stepper Motor Control with DMX Technical Info and Wiring Color Codes

Stepper motor data sheet:
https://www.omc-stepperonline.com/download/34HE59-6004S.pdf

Stepper driver: DM860T https://www.omc-stepperonline.com/download/DM860T.pdf

Dip Switch Settings: 800 Steps, full power

1=OFF, 2=ON, 3=OFF, 4=ON, 5=OFF, 6=ON, 7=ON, 8=ON

WIRING COLOR SCHEMES
Stepper Controller, this is the same wiring for both motors.

Stepper MOTOR Controller (Black box with Fan):

Color code connections from Arduino Box to Stepper Controller

DIR- Yellow
DIR+ Red
PUL- Blue
PUL+ Red

Color code connections from Stepper Controller to MOTOR

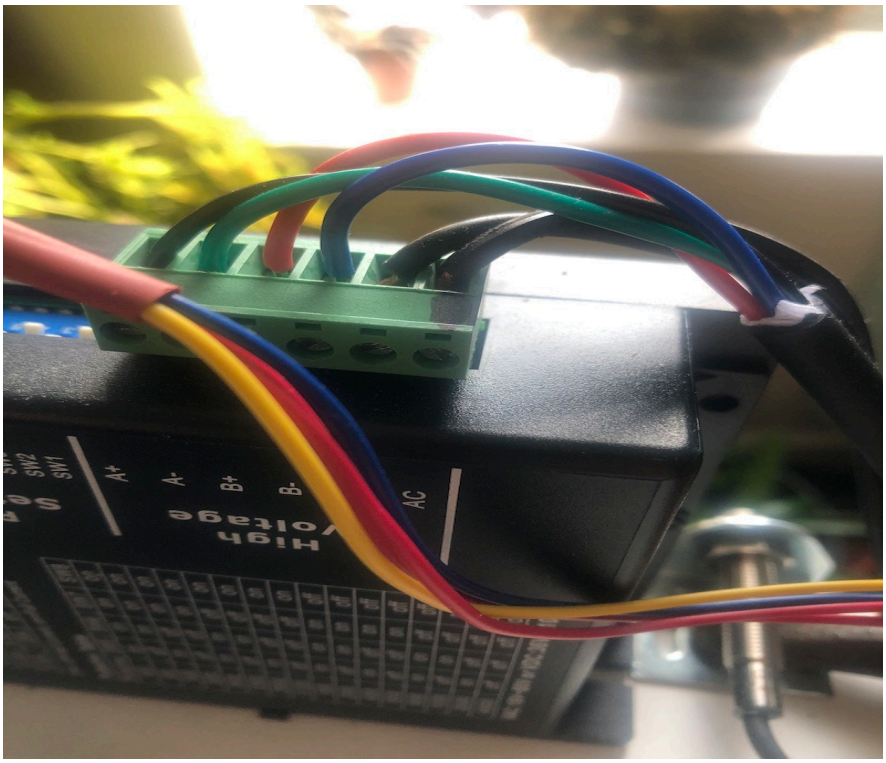
A+ Black
A- Green
B+ Red
B- Blue
+ 45 vdc
- Ground

Home Position Proximity Sensor

Color code connections from Arduino Box to Stepper Controller

Red to Brown
Black to Black
Yellow to Blue

Stepper Motor Control with DMX Wiring and Dip Switch Photos

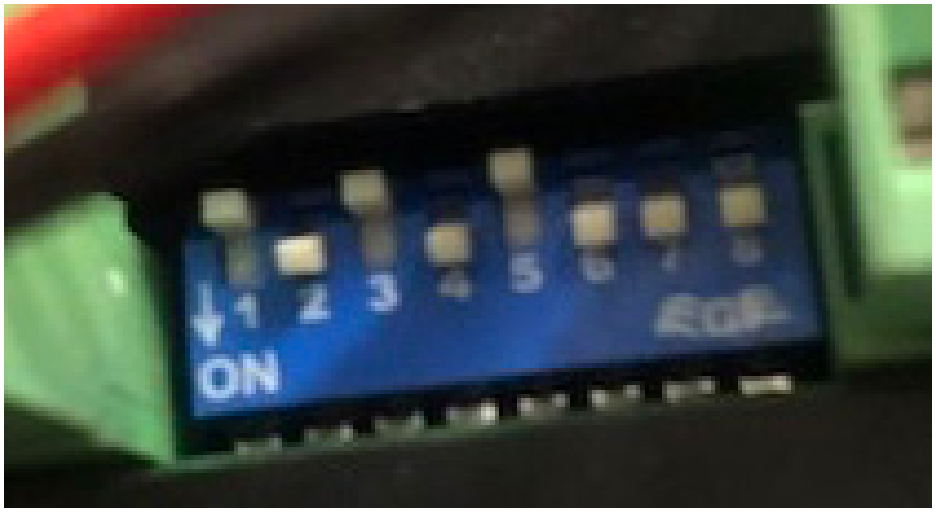


Color code connections from Stepper Controller to MOTOR

A+ Black
A- Green
B+ Red
B- Blue
+ >40 vdc
- Ground

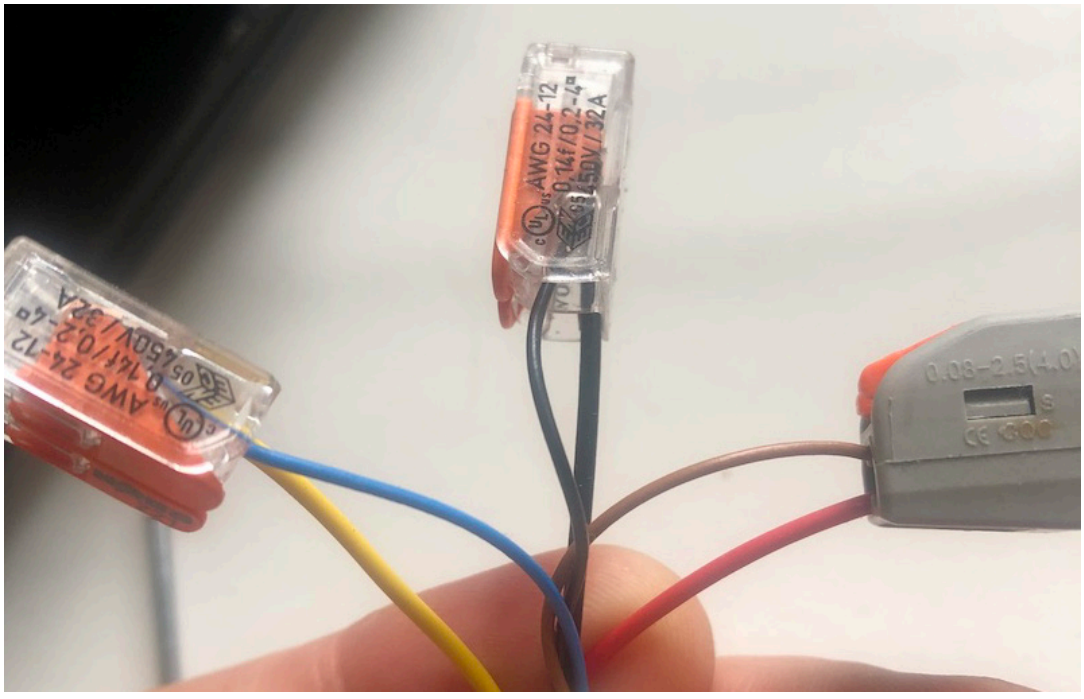
as of version 2_3

1=OFF, 2=ON, 3=OFF, 4=ON, 5=OFF, 6=ON, 7=ON, 8=ON



Color code connections from Arduino Box to Stepper Controller

DIR- Yellow
DIR+ Red
PUL- Blue
PUL+ Red



Home Position Proximity Sensor

Yellow to Blue
Black to Black
Red to Brown

Stepper Motor Control with DMX in SITU

Note the Blue LED is on when Performing a DMX Mode controlled by Isadora


Ring


ring

Stepper Motor Control with DMX

Modes for PLANET / RING Motors

Mode 0: Stop Motors

Mode 1: Auto Home, rotate to home position
(planet and Ring Autohome in opposite directions)

Mode 2: Do 1 rotation with acceleration and deceleration
(in beta, count is not correct)

Mode 3: Do X rotations with acceleration/deceleration, where X is your value (in beta, count is not correct)

Mode 4: Accelerate to constant speed CW X, then, when triggered, back to stop, where X > 0 && <= full speed

Mode 5: Accelerate to constant speed Full Speed CCW X, then, when triggered, back to stop, where X > 0 && <= full speed

Mode 6: Accelerate to constant speed FUll Speed CW X, then, when triggered, back to stop, where X > 0 && <= full speed

Mode 7: Accelerate to constant speed CCW X, then, when triggered, back to stop, where X > 0 && <= full speed

Mode 8. Live Mode with Dynamic Position Control
Move to specific cardinal points, or degrees in between

Mode 9: Accelerate to Speed CW, Live Control
(in beta, ramping is unstable for faster speeds)

Mode 10 Accelerate to Speed CCW, Live Control

Stepper Motor Control with DMX

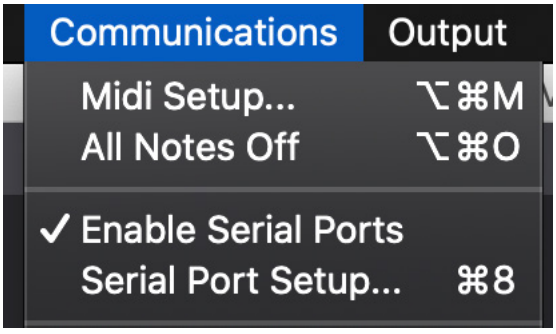
Transmit DMX with Isadora and an ENTTEC DMX USB Interface:

https://www.enttec.com/product/lighting-communication-protocols/dmx512/dmx-usb-interface/

To send DMX with Isadora using an Enttec DMX USB Pro:

Select and Enable the Device in the menu:

Communications>Serial Port Setup...



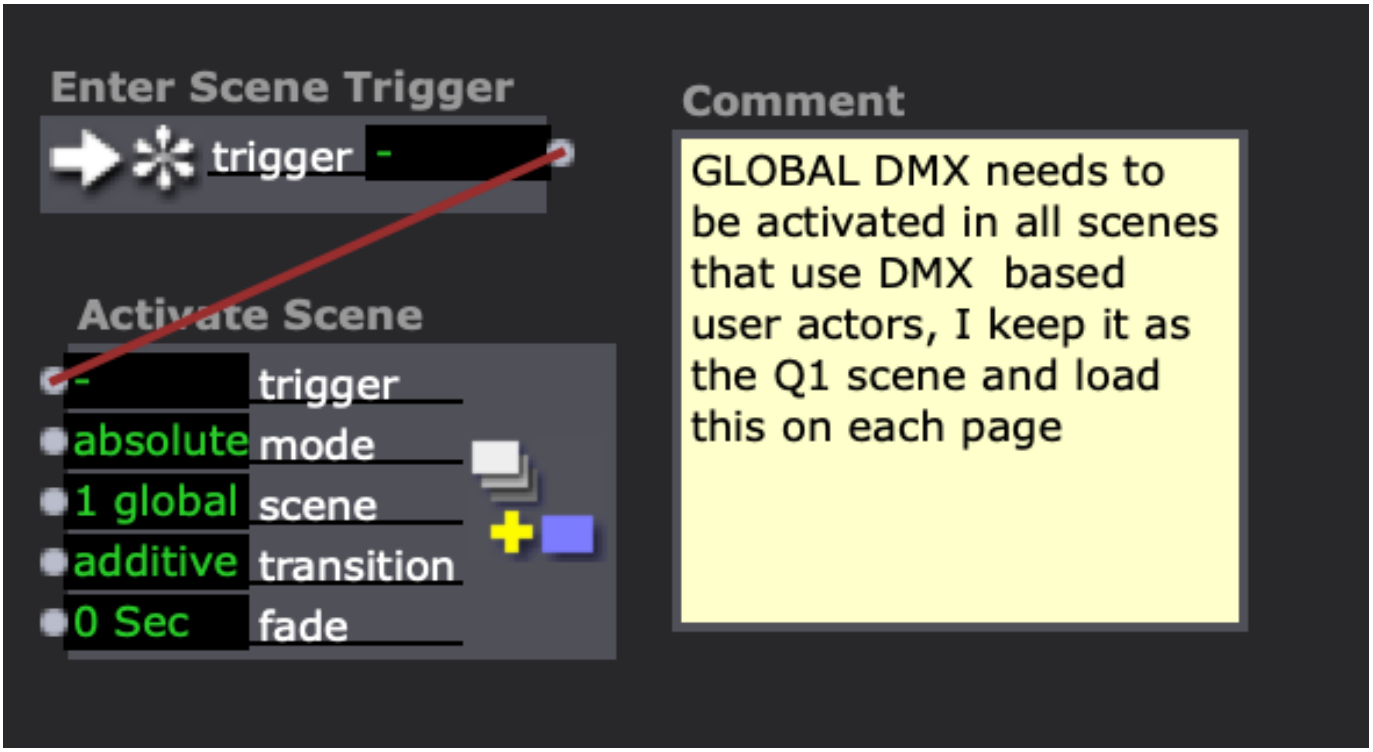
Stepper Motor Control with DMX

File referenced: planetRing_motor_index_v3_x.izz

Transmit DMX with Isadora and an ENTTEC DMX USB Interface:

Q1 in the example Isadora Patcher is a 'Global DMX' Scene.
For DMX to be available for the Enttec Device,
make sure that this scene is activated.

I have included an Activate Scene actor with an *enter scene trigger* in each demo scene for this, I suggest including it in any Isadora Scene that needs to use the DMX.



Stepper Motor Control with DMX

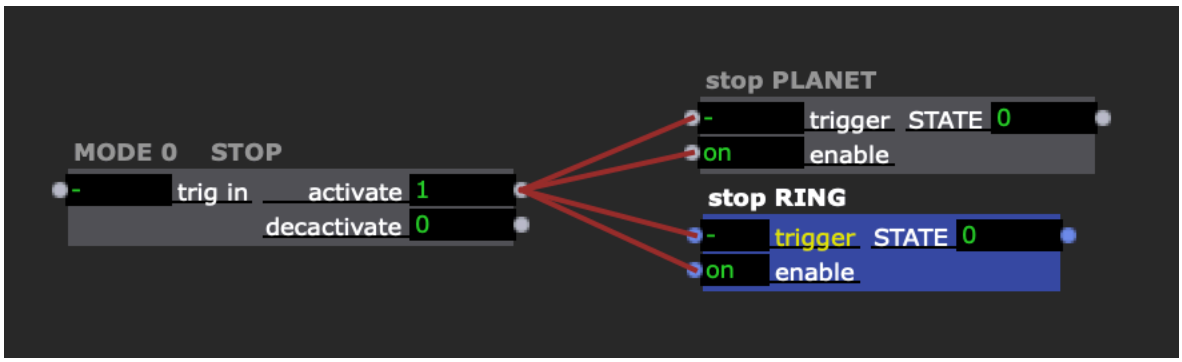
Isadora Control

All Control Modes are encapsulated into Isadora User Actors.
Please DO NOT EDIT these User Actors, they have timing and values that are specific to the whole system.
These User Actors are labled and have an ENABLE input.
There are User Actors for each device PLANET / RING

NOTE: Only ONE User Actor for each device may be Enabled at the same time for the device to work Properly. If using multiple modes in one scene, make sure to enable/disable the User Actors as necessary. To make this easier I have included a Mode Stop/Start User actor. Remember to set the Enable State and to trigger the user actor.

Mode 0: Stop Motors

Each example Scene (“Q”) that I provide uses an Enter Scene Trigger to Stop the Stepper motors.



Stepper Motor Control with DMX

Example Scene Q2:

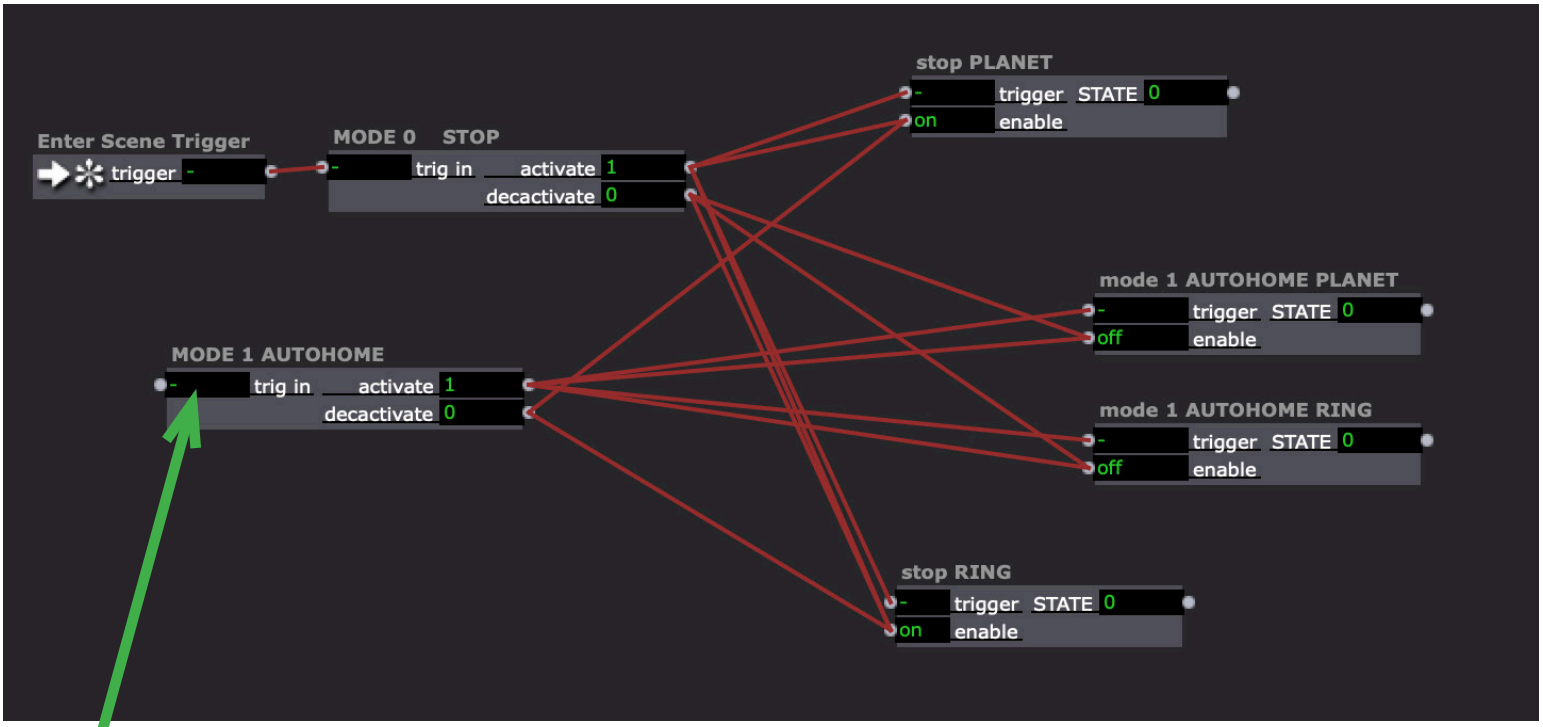
Mode 1: Auto Home.

Planet and Ring rotate to home position.
Home Position is determined by a Proximity Sensor Located on the Axle of the Planet / Ring . Both Panet / Ring will face forward.
(Note:Planet and Ring Autohome in opposite directions).

You may trigger these separately and simultaneously.

Example Scene: Q2 Mode 1 illustrates how to AutoHome both Planet and Ring. Note the Enter Scene Trigger Stops Both Motors and ensures that Mode 1 is DISABLED.
Pictured: **Mode 0** is ENABLED and **Mode 1** is DISABLED

- You may then trigger Mode 1 Autohome *Planet/Ring*.
When you trigger Mode 1, notice in the image below,



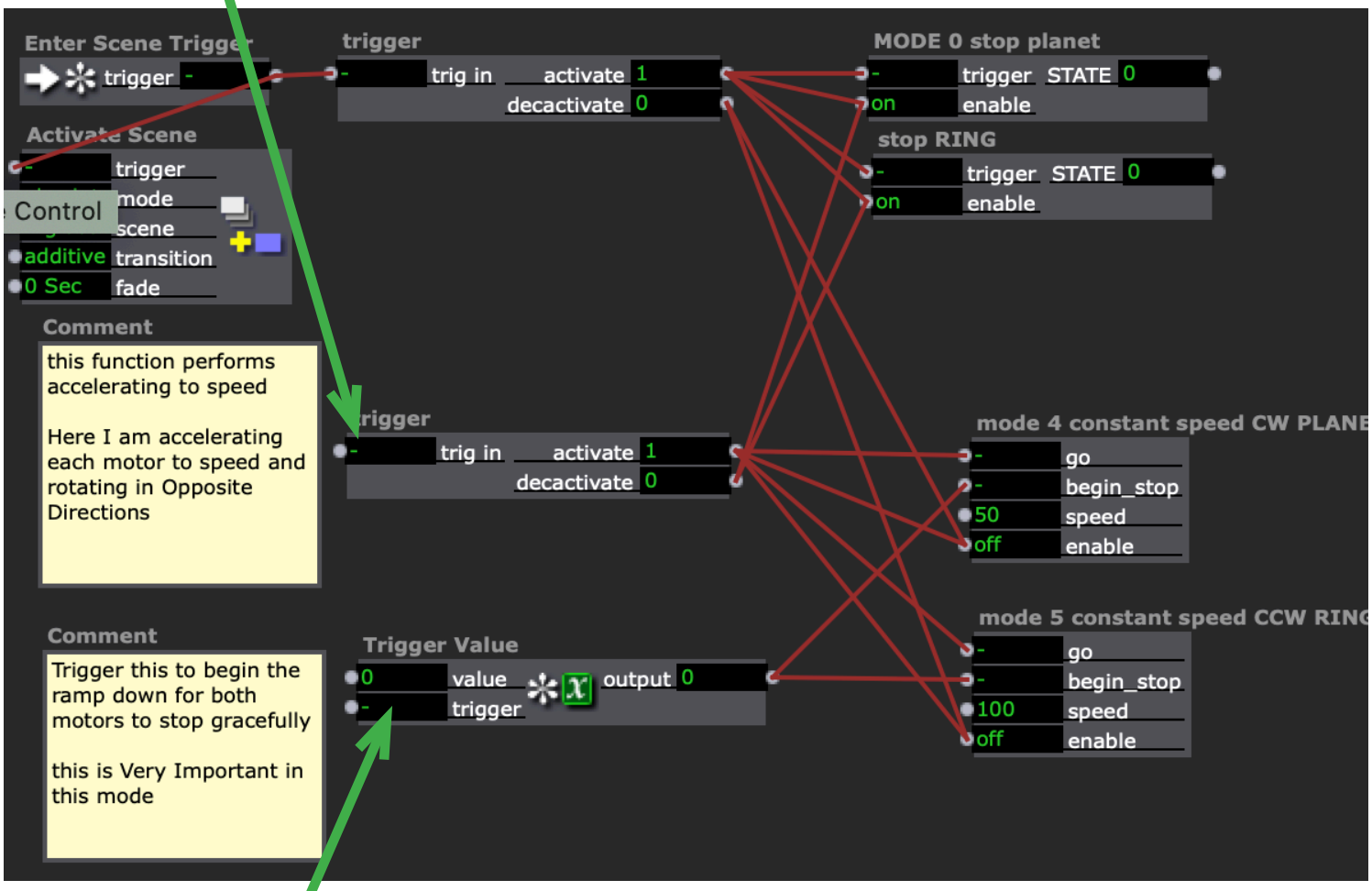
Begin AutoHome Mode with this trigger.
Note: it will ENABLE the Mode 1 User actor and DISABLE the Stop User Actors

Stepper Motor Control with DMX

Example Scene Q3:

Modes 4/5 : Rotate Motors to constant speed.
Q3 rotates motors in Opposite Directions.
Planet and Ring rotate to constant speed, here in opposite CW/CCW directions

Trigger the ramp up to speed here:



Begin Ramp Down to Stop, this will gracefully stop the motors with deceleration.

This is VERY IMPORTANT. Changing scenes without stopping gracefully and/or stopping using Mode 0 while motors are at speed, may damage motors.

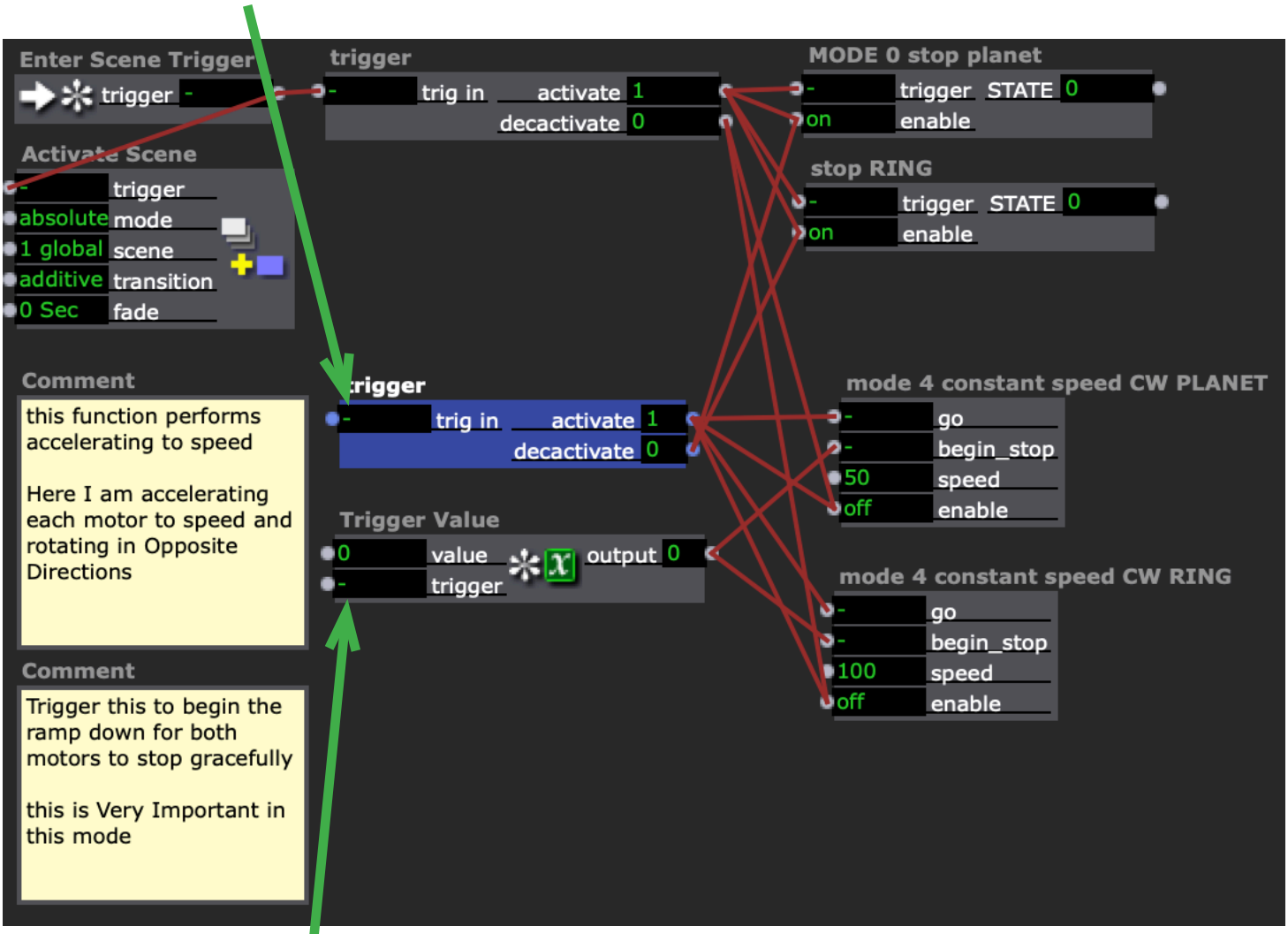
Stepper Motor Control with DMX

Example Scene Q4:

Modes 4/4: Rotate Motors in One Direction.

Planet and Ring rotate to constant speed, in the image below notice that both Mode 4 constant speed CW planet/Ring user actors are in use.

Trigger the ramp up to speed here:



Begin Ramp Down to Stop, this will gracefully stop the motors with deceleration.

This is VERY IMPORTANT. Changing scenes without stopping gracefully and/or stopping using Mode 0 while motors are at speed, may damage motors.

Stepper Motor Control with DMX

Example Scene Q5:

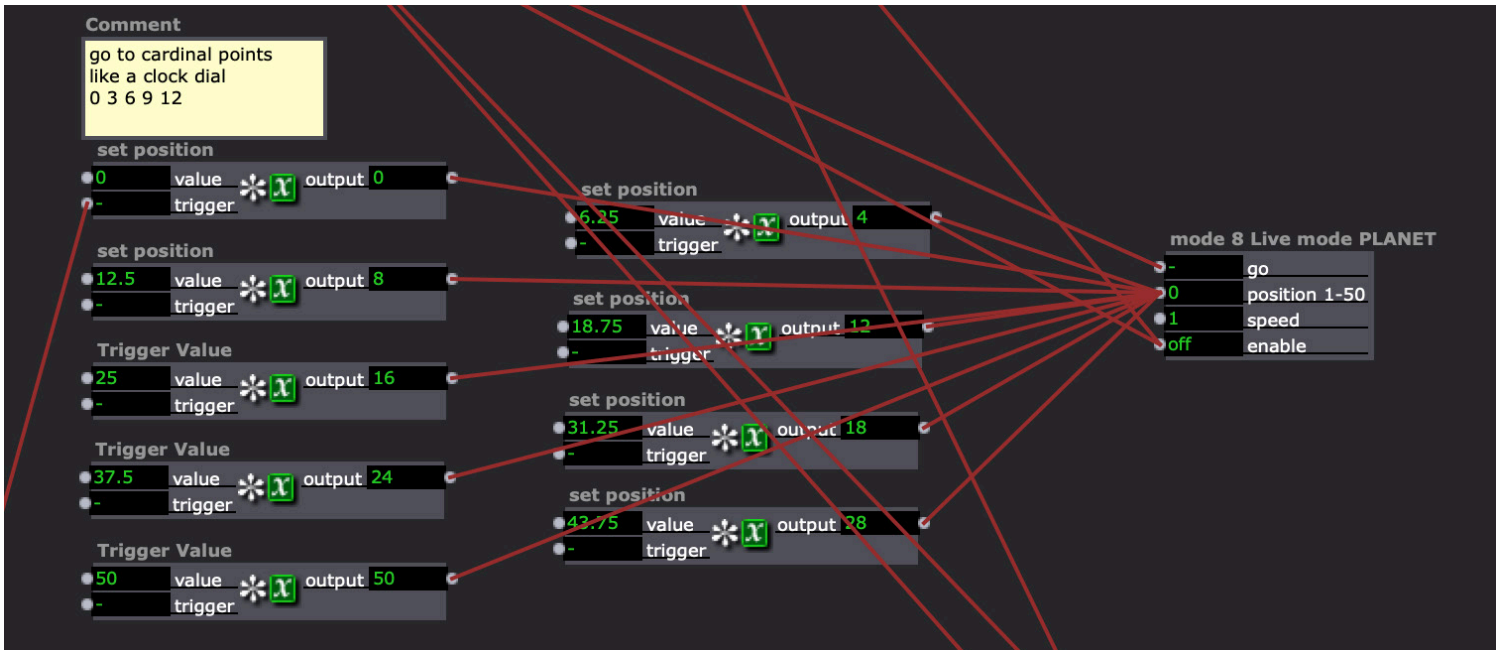
Q5 MODE 8 LIVE

Mode 8: Live Mode: Dynamic Position Control

Position and acceleration movements are posible on a 0-50.0 scale, floats are possible to acheive smaller steps.

In the image below of Isadora Scene Q5, an example of how to use Mode 8 *Planet/Ring*, Isadora Trigger Value actors are used to set positions in the Mode 8 “position 1-50” user input.

What I call ‘Cardinal Points’, clock positions are provided 0-3-6-9-12



Stepper Motor Control with DMX

Planet / Ring Indexes and DMX Test Mode

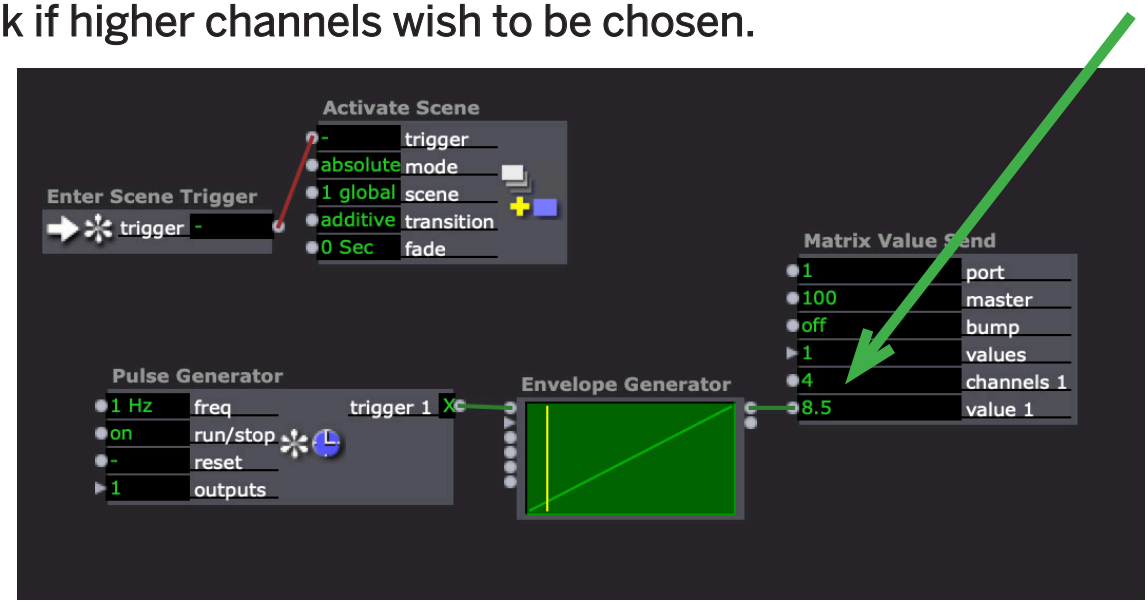
The INDEX SCENES Q6/Q7 provide all available Modes.

You can copy / paste these User Actor Modes (1-8) into other scenes, remember to add ENABLE / DISABLE logic to ensure the stepper motors will work correctly.

Modes 0, 1, 4, 5 & 8 have been prioritized for use with the current system.

Note Modes 2, 3, 6, & 7 are not fully developed and in a Beta stage. These MAY be used, but there are a few scaling issues and smoothing issues that make these modes less predictable. If interest in developing these modes increases, we can work to refine.

Test DMX: Scene Q8 acts as a dmx tester, blink channel 4. Use the provided DMX 4channel Dimmer Pack to monitor 4 channels of DMX signal. This Scene blinks channel 4.
NOTE: the DMX address can be changed in isadora and on the dimmer pack if higher channels wish to be chosen.



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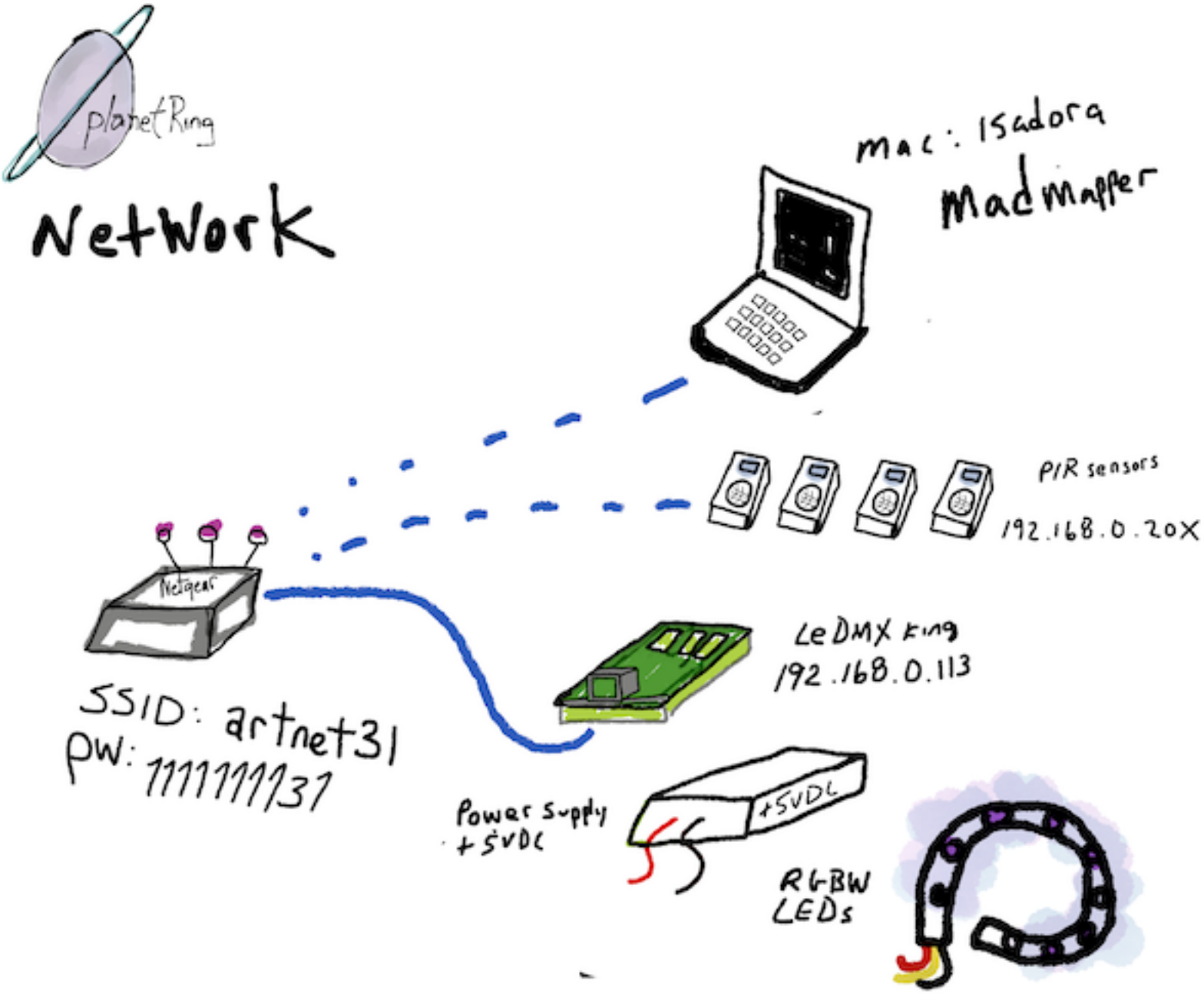
Part 2: Artnet & Network Information



Network Information

Netgear Router Information
Recommended to stay ON and not be rebooted often.

username admin pw is admin31
first netgear product is ‘nighthawk’
best friend is 31down

Router:
IP Address
192.168.0.1
192.168.255.0
gateway:192.168.0.1

SSID: artnet31
pw: 1111111131

'GEAR AX1800 WiFi Router RAX10

Configuration Complete

Your new WiFi credentials are displayed below.

artnet31
1111111131

artnet31
1111111131

Network

LeDMX4 Pro by DMX King:

IP address:
192.168.0.113
255.255.255.0

MADMAPPER ARTNET START UNIVERSE 0

more info and the manual
https://dmxking.com/led-pixel-control/ledmx4-pro

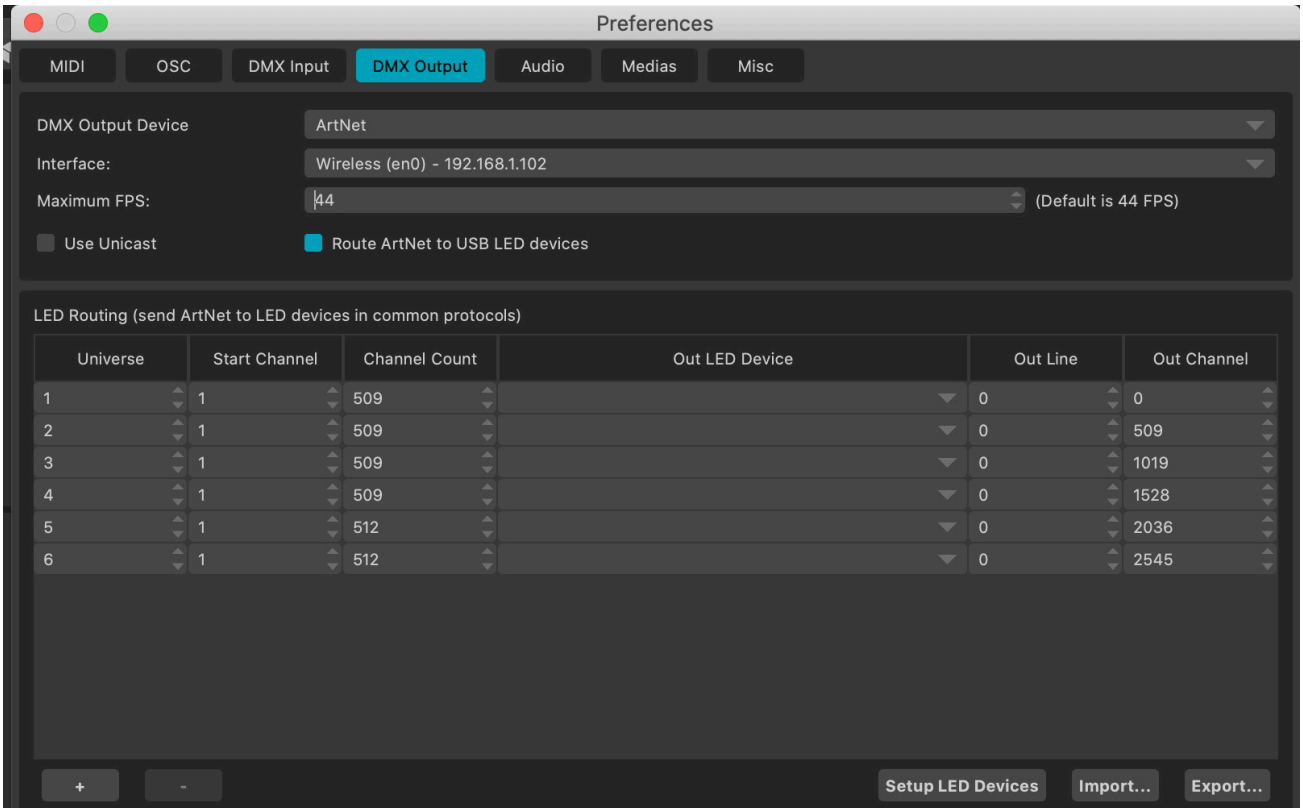
Network

MADMAPPER:

ip address:
192.168.0.XXX
255.255.255.0

MADMAPPER ARTNET START UNIVERSE 0

install the LED Artnet Preferences File for DMX setup.
Included file: planetRing_madmapper_led_preferences_file.madled

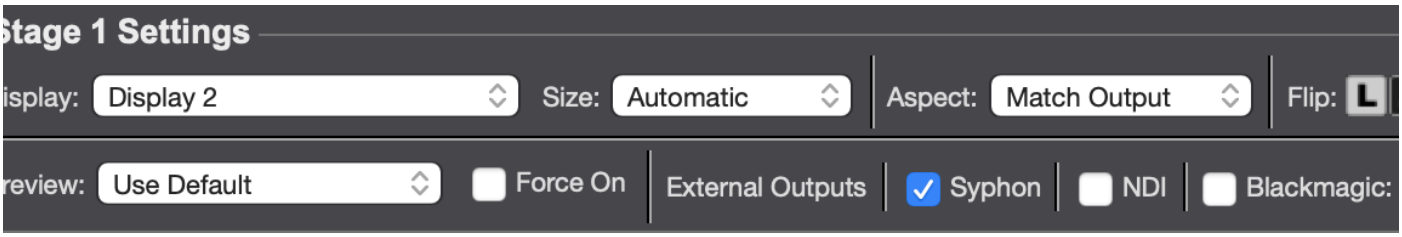


artNet to LED Info

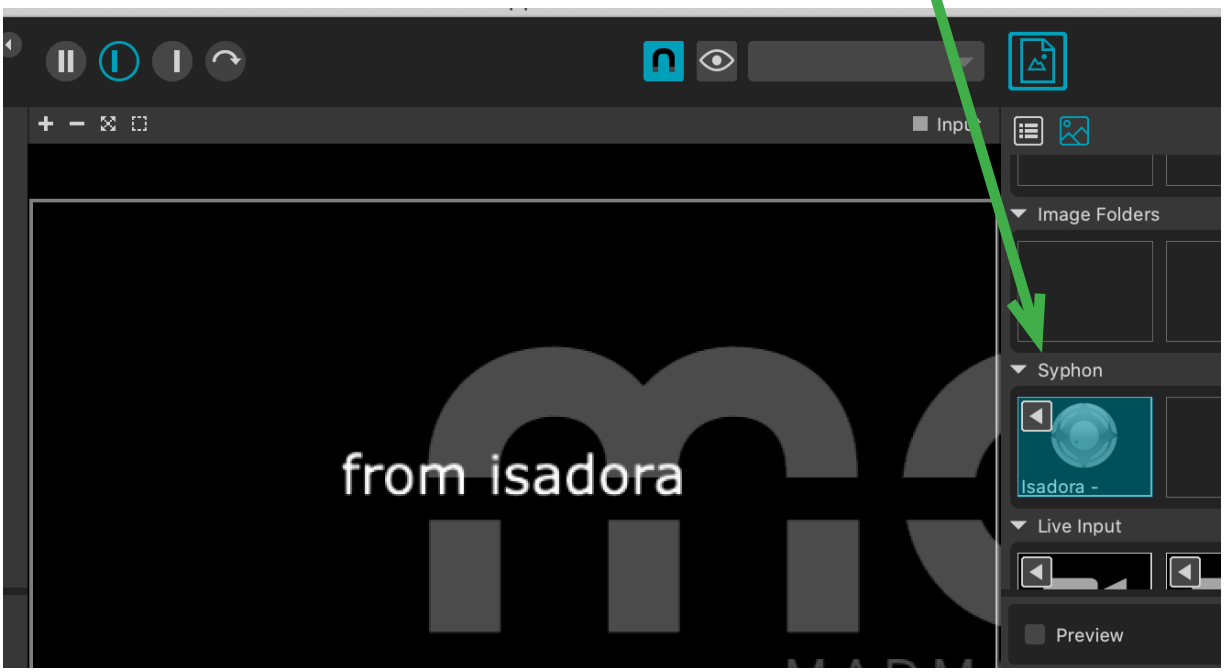
ISADORA Syphon to MadMapper for Artnet

Send video from isadora to MadMapper with Syphon.

In Isadora > OUTPUT > STAGE SETUP..
check the appropriate box.



Isadora to MadMapper with Syphon
Choose Syphon > Isadora input



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Part 4 Troubleshooting (working)

Stepper Troubleshooting:

Are the steppers receiving power?

Are LEDs ON:

Controller will be green/Red? Planet or Ring boxes will have a Blue LED

Is the ENTTEC device Enabled in Isadora? Is the ENTTEC device sending DMX, you can use the provided dimmer at the end of the signal chaiin to test this.

Artnet Troubleshooting:

are LEDs and DMX King device receiving power?

are the computer and LeDMX King devices on the artnet31 network?

Is MadMapper a Demo License?