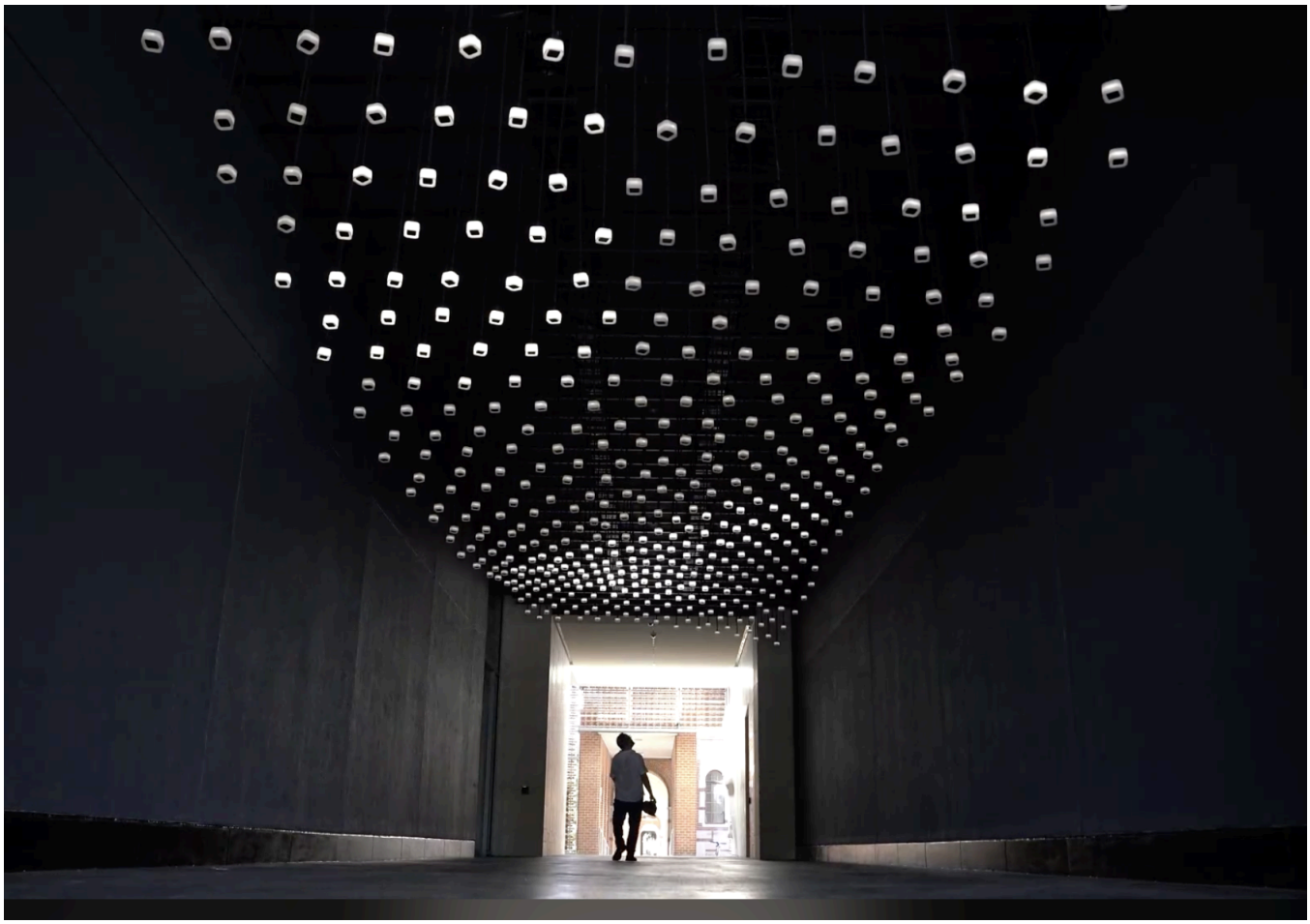
CLIMATE PARLIAMENT

BY RAFAEL LOZANO-HEMMER



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GENERAL IMPORTANT INFORMATION

CLIMATE PARLIAMENT (2024)

BY RAFAEL LOZANO-HEMMER

Technique

481 Custom-made speakers and electronics, LED lights, computer, micro-SD cards, cameras.

Description

"Climate Parliament" is an interactive sound and light installation featuring thousands of audio channels playing on small, custom-made loudspeakers, suspended under the ceiling of a semi-outdoor passageway at Rice University. The speakers are hung out of reach of passers-by in a regular, but staggered formation that creates semi-circular archways with a six-foot radius.

Commissioned by the Moody Center for the Arts, the piece contains thousands of field recordings that highlight the rich, diverse, urgent, yet often unreported history of civic, academic, political, scientific, and philosophical resistance to human-made environmental collapse. Each speaker plays a different recording of protests, academic presentations, civil disobedience, discussions, and other sources from archives spanning the twentieth and twenty-first centuries—from interviews with Rice professor Timothy Morton to speeches by the young activist Greta Thunberg, to the collective cries of student-led protests. The piece responds to the movement of passers-by whose presence automatically triggers waves of sound and light that dissipate along the sonic arcade. The project results in a complex polyphony that emerges from the array of field recordings, creating an environment of critical reflection for the participant. Each speaker is equipped with a small ring of white LED light that visualizes the waves of playback from the speakers. When no one is detected, the speakers are silent and dim, while if several people are in the passageway, the speakers are triggered and brightened, forming complex patterns generated by their movements.

The installation is part of a series investigating the perception of thousands of simultaneous sounds, each playing on a different dedicated loudspeaker, referencing what Lozano-Hemmer calls "speaker as pixel." A pixel is a point of light varying in intensity and spectral frequency; coordinated with its neighbours, the perception of pixels produces images. The question is, if we have hundreds or thousands of sound sources in an array, can we experience the emergence of a new perceptible complexity beyond the expected cacophony? (Short answer: yes.)

Operation

Please refer to Appendix I - Installation for detailed system information and wiring diagram.

1. To turn the piece **ON**, press the power button of the computer for half a second then release it. After 2 minutes (maybe faster), you should see the artwork running automatically. The display might require to be turned on, for this use it's remote or the button at the back of the display. *Important notes: please do not push the button again as this will shut down the piece. Wait at least 2 minutes before pressing it again as the computer might take that long to boot.*

2. To turn the piece **OFF**, press the computer's button all the way down until you've seen the "Shutting down..." screen appearing and fading to a black screen (shouldn't be required for more than 2 seconds).

3. If the piece doesn't start within two minutes, try turning on the computer again. If it still doesn't turn on, then hold the power button all the way down for 10 seconds. Then, wait at least three seconds, then press the power button all the way down for one second, and you should be up and running again.

4. The software will start automatically after the computer's boot sequence. Alternatively a *"start of day"* OSC network command can be sent.

Maintenance

During the running of the piece, as often as possible, walk around and check:

- That all LED strips light up correctly and do not exhibit any extreme flickering.
- That none of the speakers produces any harsh distorted sounds due to corrupted SD-Cards.
- Check interactive tracking is still functional and well aligned.

For shows of a longer duration or permanent installation, you will want to dust the speakers from time to time. Please use compressed air to dust them off. Alternatively, an antistatic duster could be used, however, it should be done with care around the ethernet cable connectors to prevent disconnecting the speaker. Also be careful around the led strips as these are glued onto the speakers, a duster catching onto a LED strip could pull it off from the speaker.

Placement Instructions

The ceiling height of the exhibition space should be at least 6m (20'). The floor is preferably waxed concrete or another reflective material. The preferred speakers' hanging height is 3-4m (10-13') away from the ground. The positioning and distribution of speakers should be discussed with the studio, to establish the best layout for the exhibition space.

DETAILED TECHNICAL INFORMATION

Normal Software Operation

The computer tracking people, triggering light and sound is sitting in the rack, with the rest of the controllers. It runs 24/7, with a scheduled reboot everyday, near 2AM, ensuring some breathing time for the electronic components.

Two softwares are in use:

- RippleFX.toe: Captures camera and creates the interaction ripple effect
- SendingDmx.toe: Captures texture sent by RippleFX.toe and sends light and sound commands to speakers

Normal operation includes:

- Triggering of a wave-like pattern when visitors pass through the extremities of the breezeway. The sound will also be triggered, the volume of those is low by default
- 2 speakers at a time are constantly ON and pulsing, the volume of those is loud. Their position is randomized and changes in a range between 45 to 75 seconds.
- When no one is there, only those 2 speakers should be heard

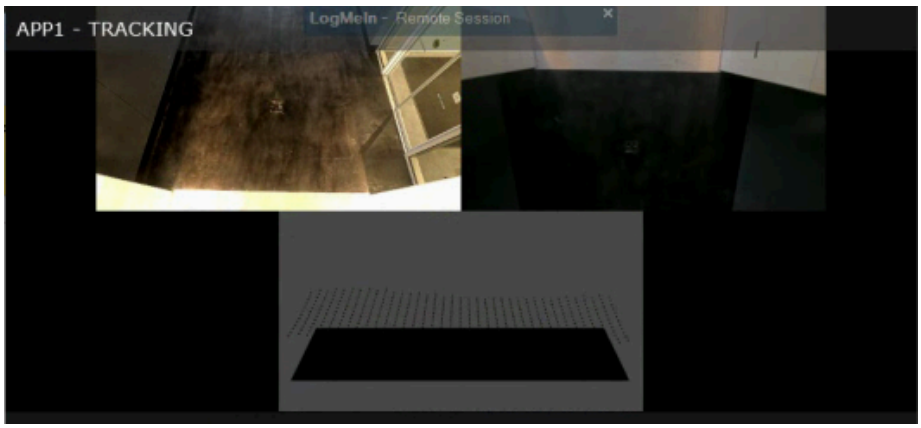


Image of RippleFX.toe

Image of SendingDmx.toe

Manual Software Calibration

Variables for adjustments are available in the SendingDmx.toe interface which is visible by default. The following table shows the variable names and a description of their functionality.

Setting / Button	Description
Enable Performance Mode	Toggle turning it On or Off. **By default, it is On.**
Scheduled Time	Sets the time when the Performance Mode would launch. **By default, it is 6:00 PM** (18:00, 24h clock). Can be modified to match your preference.
Sound Viewport	Shows the triggers sent to the speakers. It flashes frequently when no one interacts with the piece to show a Reset has been issued to all speakers.
Lights Viewport	Shows what goes to the lights, it should look mostly like ripples and 2 speakers flashing.
FPS (next to Lights Viewport)	Framerate of the software, it should always be around 60 showing the app functions properly.
Reset Button	**Should be used only for debug purposes.** Sets all the speakers to their default volume (about 50%) and returns to the beginning of the first track. The speaker will be in PAUSE mode (ie. play command must be issued after reset).
Progress Bar	Only there for debug purposes, do not use it.
Previous Button	**Should be used only for debug purposes.** Gets all speakers to go to their previous track.
Next Button	**Should be used only for debug purposes.** Gets all speakers to go to their next track.
Play Button	**Should be used only for debug purposes.** Gets all speakers to play their current track.
Pause Button	**Should be used only for debug purposes.** Gets all speakers to pause their playback.
Vol+ Button	**Should be used only for debug purposes.** Increases all speakers' volume up to 10% louder.
Vol- Button	**Should be used only for debug purposes.** Decreases all speakers' volume up to 10% quieter.

Preliminary Troubleshooting Steps

The lights and or the sound aspect of the artwork is out of sync.

The softwares SendingDmx.toe and RippleFX.toe are launched, in such an order, by the Windows Task Scheduler, and delays the software launch to allow all system resources to be loaded in priority. A service is always running behind called Axis Streaming Assistant and allows the security cameras to be captured by the software. Check to see if all of the mentioned softwares are launching properly and that the order of the software launches is SendingDMX.toe and then RippleFX.toe

A reboot of the computer would make sure all software is launched properly. If this doesn't solve the issue, the two other things to verify are the state of the cameras, the acquisition of their feeds in TouchDesigner, and the physical connection that sends DMX from the computer to the controllers.

If a speaker has lights on and no sound, the problem might be the SD card.

Check if there is no SD card in the speaker. To do so; Unscrew the IP67 cable head, lift it carefully from the plastic shell. The clip of the RJ45 cable needs to be pressed down to release the speaker (use of a thin metal implement is best for this task). Once released, unscrew the plastic shell from the speaker, see If there is a SD card, remove the SD card (Might need tweezers) and put the card back into the speaker.

If the SD card works, the sound will play. If there is no SD card, check the label on the speaker and refer to the list of sound profiles to find the sound you need to replace.

If a speaker is replaced, take the SD card out of the speaker being replaced and put it in the new speaker. If there is a SD card in the replacement speaker already, please remove it and put it in a safe, non-static bag or container.

If a LED is off or dim

Check if the 2 power pins are crossed. If they are not, try switching the cable in the speaker with the one next to it. If the LED stays off, the issue is in the driver and not the speaker itself.

If the LED strip stays dim but not off, the issue is in the driver and not the speaker itself.

If the issue is the speaker and not the cable, replace the speaker.

Make sure the cable of the speaker is plugged into its controller firmly. Tug on it, it should hold firm, if you slip out, reset the clip to hold the cable more firmly or if the clip is broken then you should apply a clip replacement to it.

A section or single speaker lights are dim

If a light is out or dim and it is NOT the speaker itself causing the issue, the Murmurator is the issue and needs to be replaced. Turn off the power to do so and replace the Murmurator with another that shares the same DMX address label.

A whole section is off

If there is a whole section of the piece off (LED or Sound), in the number of 16 , then a control box is not receiving power or data. The power of the boxes are received by cables that run on the outside of the control boxes then plugs into it from there.

The data is also received from ethernet connections made between control boxes from outside plugging ethernet connections, confirming the proper function and plugging of these cables and if they need to be replaced. They will be pulled into ports noted as DMX IN and DMX OUT respectively.

A section is playing sounds with no lights

The controller needs to be power-cycled to ensure that old commands can be cleared and allow for the controller to newly receive commands. This can be achieved by either pressing the switch of the plug located next to the power plug or physically unplugging the cable that runs from the back of the box. In either case, let the unit be without power for 3 - 5 seconds before returning power.

A section of lights are mirrored or out of line

The controller might share a DMX starting address with another in the Universe, replace the controller with one of the spares with the proper address. If this resolves the issue you will need to properly re-address the DMX controller.

A portion of or the whole room is in a frozen state: no reaction happens in any light or speaker

This potential situation may happen when the data isn't flowing properly between the computer and the rest of the components. We recommend looking at the main connections between the computer, the DMX controller, and the speaker controllers, securing them if needs be. Ensure the computer is running properly and all the components are well powered.

Troubleshooting Assistance

Prior to contacting the Antimodular Studio with a problem about your artwork, please ensure that you went through the preliminary troubleshooting steps outlined in the previous section.

The troubleshooting process will vary depending on the problem. In order to make the process easier, it is recommended that you collect and send the following information to the studio:

- Date and time when the problem first happened;
- Description of the problem;
- Actions taken so far and conclusions;
- Detailed photographs (or videos) displaying the problem;
- Detailed photographs (or videos) of the suspected faulty component;
- Detailed photographs (or videos) of the whole artwork and its surroundings;
- Personnel involved.

Support (Contact Us)

If you would like support for the piece, please feel free to call Lozano-Hemmer's studio in Canada:

Antimodular Research
4462 rue Saint-Denis
Montréal, Québec, Canada
H2J 2L1
Tel 1-514-597-0917
info@antimodular.com
www.antimodular.com

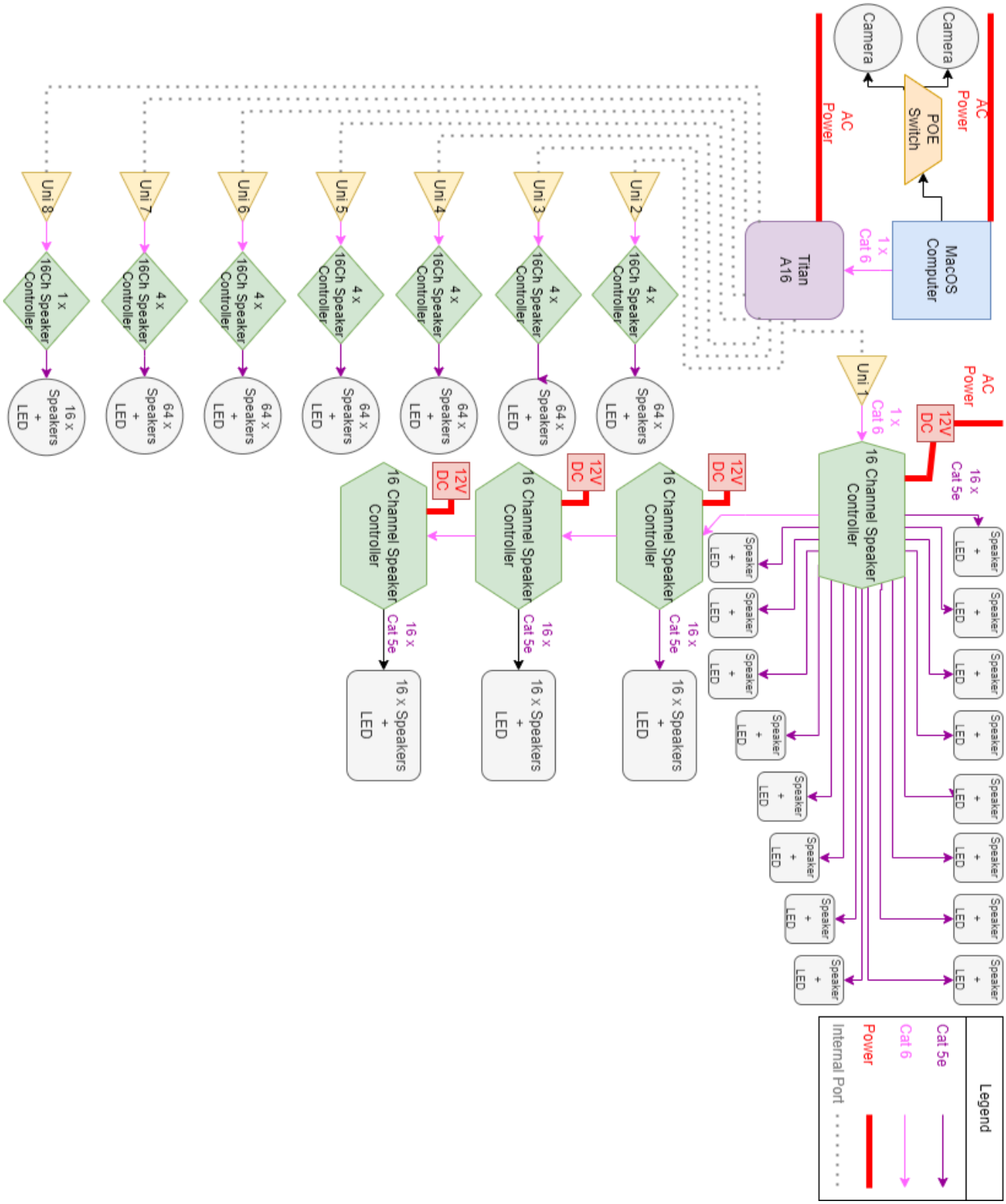
APPENDIX I - INSTALLATION

Description of Components

This artwork requires the following components:

Component	Description
Speaker with onboard LED strip	Custom-made speaker that plays back a few compositions. Track selection and play state depends on the software commands.
Plastic “bell” cover	Custom-made enclosure to protect the speaker from water.
microSD card	Storing the different compositions specifically picked for a specific speaker.
Ethernet Cables	Connect to the speakers and provide both power and DMX signals
Speaker controller	Sends over the power and playback signals to the speakers.
DMX controller	Carries over the playback commands from the computer to the controllers.
Computer	Computer that runs the software that controls the whole artwork rendition and sends signals to the Artnet to DMX controller.
Network Switch	Allows transmission of the camera feed to the computer. Since the cameras provided are powered over ethernet, such a feature would be necessary for this device.
Ethernet cable	Carries signal from camera(s) to computer.
Camera(s)	Used to detect movement in the exhibition space.
USB to ethernet adapter	Allows the computer to connect to an internet-enabled network but also interface with the Storm 24 in tandem.
16-port Ethernet to DMX converter (Titan16)	Carries the ARTNET signal to the DMX512 that controls the dimmers. Each port is numbered and that number corresponds to the universe number.
Monitor	Used to control and display the software. Monitor can be shown or hidden.
Video cable	Connects the computer to the display.

Wiring Diagrams and Connections



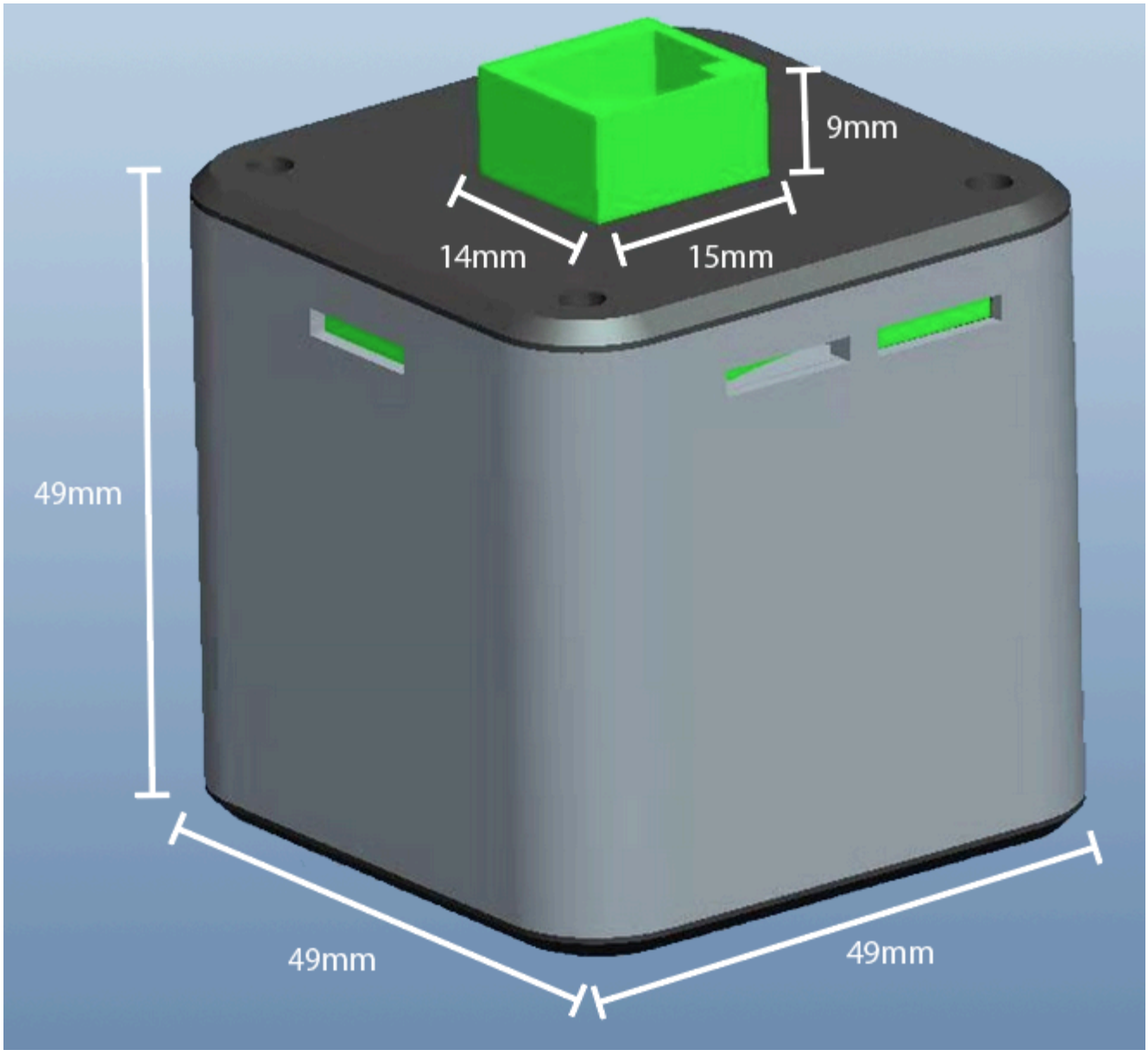
General connections of the whole artwork.

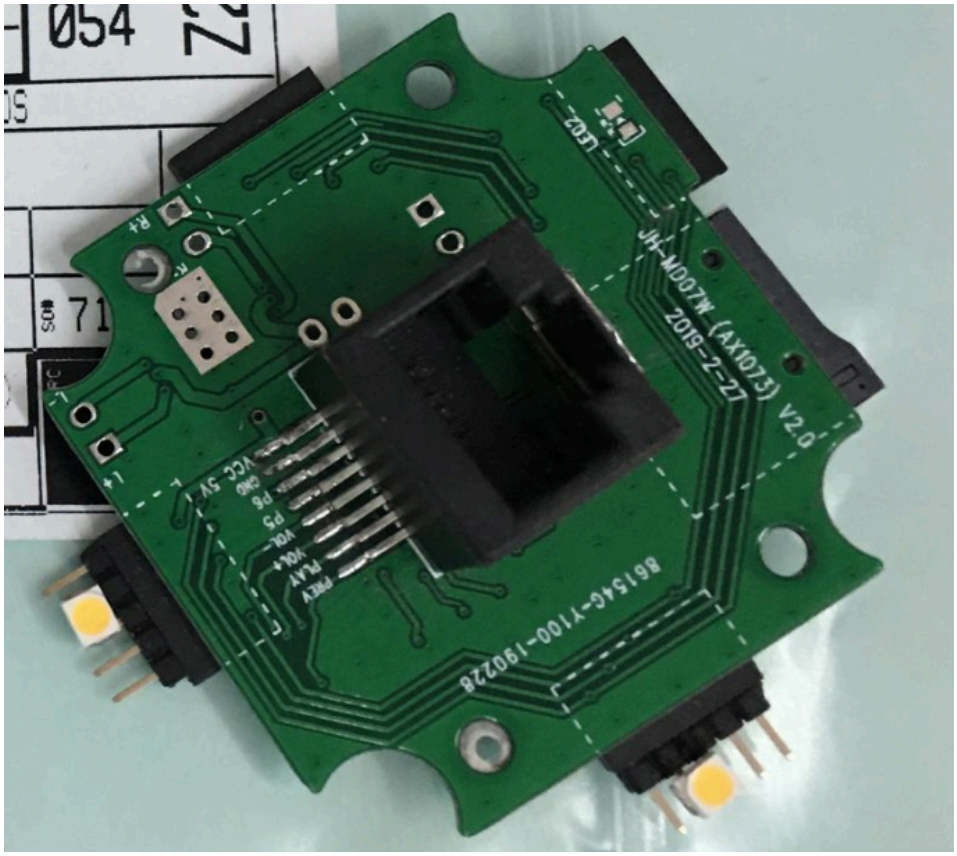
APPENDIX II - TECHNICAL DATA SHEETS

Speaker

The speaker is the most forward facing aspect of the artwork. The speakers have been custom built for the studio by Junjiahao Company Limited. The units used in this installation are Speakers version 2.

They receive 12V and DMX signals from the RJ45 connection and divert 5V (+ and - leads) on the side to control the LED strip. They read a microSD card to play audio files and can control volume up, volume down, play, pause, next, back, and reset.





The 5V (+ and -) leads of the LED strip should never cross or touch. If the pins are crossed or jumped, remove the speaker from its cable immediately. ***The positive and negative polarities are very important to respect.***

The LED strip gains power from the speaker but is controlled by a driver in the speaker controller.

The speakers are hung and gain power from 8 pin RJ45 cables. These 8 pins are each used for a different function on the speaker itself. These functions are:

1 - Button Prev : short press previous track, long press = next song
2 - Button Play/Pause : short press toggle PP, long press = force pause
3 - Button Vol+ : short press = vol up
4 - Button Vol- : short press = vol down, long press = reset to default
5 - LED strip + (12V current)
6 - LED strip - (12V current)
7 - GND (5V current, negative lead)
8 - internal LED (5V current)

Speaker Commands

Speakers are controlled by receiving data on their 3rd channels. The Value shown below is the time in milliseconds that a constant current (255 value in DMX) needs to be received to perform the Action.

For example, to send the action *Reset* to the speaker, the value 255 is sent on the 3rd channel of the specific speaker for a length of 0,66 seconds (660 milliseconds).

Action	**Value (time in milliseconds)**
Play / Pause	109
Pause	500
Previous track	550
Next track	200
Volume Down	308
Volume Up	396
Reset	660

If the cable is tested and certain cores are broken, you may see a malfunction in one of the speaker's abilities to retrieve commands. The functions linked to pins 1, 2, 5, 6 are necessary for the good functionality of the artwork and would require an immediate cabling replacement. The functions linked to pins 3, 4, 7 and 8 are less critical, but you will eventually want to replace such cable.

Speakers' Plastic Bell Cover

The speakers are protected by a plastic shell which is referred to as "the bell" which diffuses the LED strip and protects the exposed connection of the speakers from direct rainfall. The bell is secured onto the speaker by a single M3 screw on top of a rubber gasket. For proper rain protection, pinch the rubber gasket with the M3 screw but do not over tighten or the gasket will slip out and no longer offer adequate protection.

The added weight of the bell is compensated by a IP67 head that secures a friction seal on the RJ45 cable that provides power for the speaker. Ensure this is properly screwed on top of the bell when installed, to avoid water damage to the RJ45 port of the speaker.

The speaker itself has a “skirt” under the LED strip to prevent direct sight of the LEDs from the bottom, however it does not fully enclose the bell to allow for water to flow out if condensation builds up in the bell.

Speaker's LED Strip

The LED strip on the speaker has been added by the studio staff. The strips have been cut at a specific length of 20cm to fit the speaker size and the product in use has been selected for the following properties:

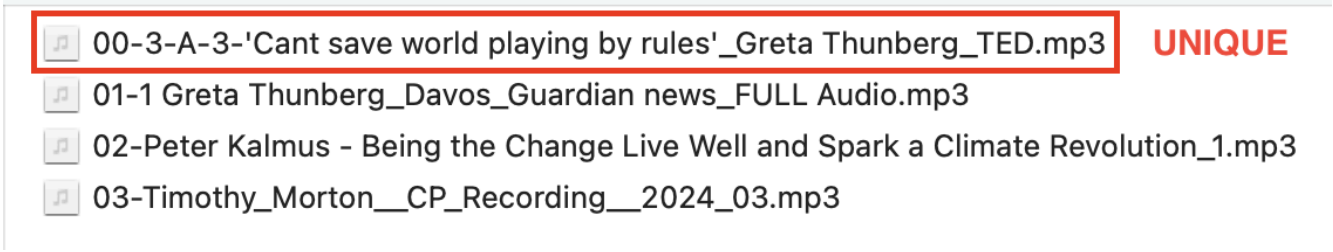
Specification	Details
LED Strip PCB	Black colored
LED Color	White light, with a 4000K color temperature
Voltage	12V
Number of LED	There is 120 leds per meter
Average Life	50,000 hours
LED Standard	LM-80
CRI level	80

The product used in this version is from Cinelite, model 2835.

On the strip, two 18mm black AWG24 cables have been soldered to the positive and negative leads and to a single row 5 pins 90 degrees connector header, with a pitch of 2mm. The model used is 2PH1R-05-UA from Adam Tech.

microSD Card

Each speaker contains a microSD card. The cards used are industrial grade SLC microSD cards: they better protect the files from getting corrupted. Each microSD card contains a specific and unique sound track (filename starting with 00-trackNumber-CategoryLetter...) and 3 files that are common to each microSD card. So each microSD card has a total of 4 tracks.



These microSD cards (512 MB to 1GB, SLC flash memory) need to be formatted in FAT16. While formatting with an OSX computer, ensure to keep the card's partition map schemes as Master Boot Record, not GUID or Apple Partition Map.

If reconstructing a microSD card is required, the specific sound file needs to be imported first, then the common files after, in sequential order (01, then 02, then 03). Otherwise, the speaker playing back the files won't be synced with the other speakers.

For more information, see the APPENDIX IV - LIST AND LABELS OF SOUND CATEGORIES for Label to Sound mapping.

The speaker is marked near its ethernet port, in a white marker scribing or a label. This refers to the category of the specific sound file this speaker should contain. The inscription denotes the sound contained in the file hosted on the microSD card populated in that speaker.

Ethernet Cables

For the assembly of the artwork, straight-thru CAT5E ethernet cables have been used. The cables have a black jacket with printing on them and they have black connectors. They run through a plastic enclosure to provide stability against wind and to allow the speakers to have straight.

The cable length will vary, depending on the exhibition's space dimension and artwork's final layout.

Labeling of cabling

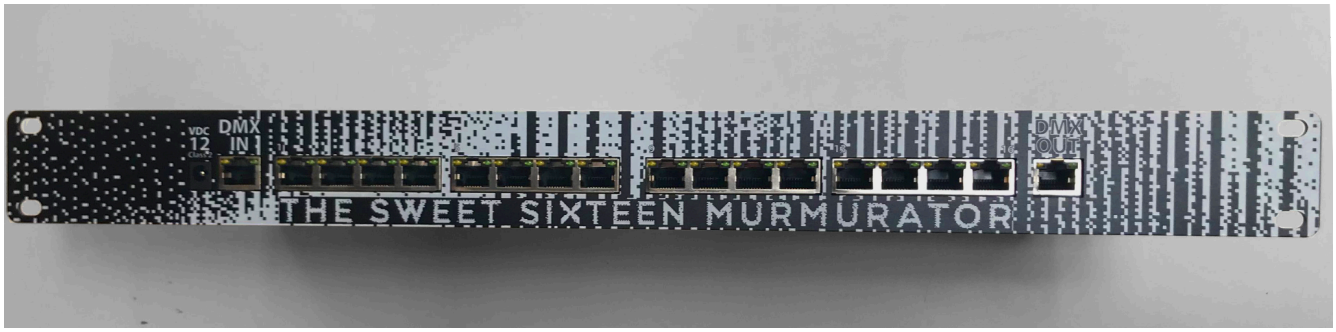
The speaker ethernet cables will all have a unique label on two parts of the installation: one label will be placed just past the attachment point of the speaker on the aircraft cable, while a second will be placed near the plugging point of the speaker controllers.

The labels read as such:

Column - Row |DMX start address| Controller ID -Port
Eg: 00-00|0|A-0

Component	Description
Column - Row	The installation is laid out in a column and row system. The "columns" are a Unistrut channel, of which there are 36. A "row" will be aligned speakers in a staggered pattern, there will be 13 rows.
DMX start address	Refers to which RJ45 port of the Speaker controller ID the cable (speaker) should be connected. Values will range from 001 to 512.
Controller ID	Refers to which Speaker controller ID the cable (speaker) should be connected. Values will range from 001 to 999.
Port #	Refers to which RJ45 port of the Controller ID the cable (speaker) should be connected. Values will range from 01 to 16.

Speaker Controllers

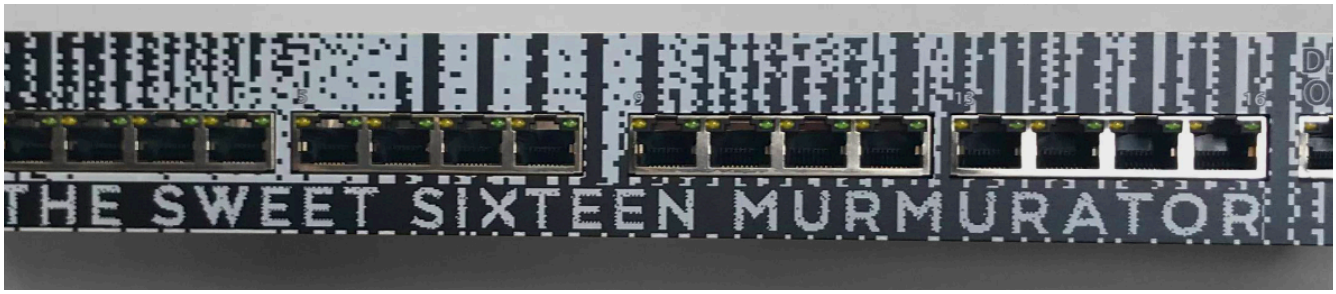


This component controls the connected speakers by sending them power and data over CAT5e cabling. These are connectable in a daisy chain to send data to extend DMX signals to other controllers on the same universe. Depending on where the speaker controllers sit in the daisy chain they will receive power either from the inlet described below or from the power supply mentioned in the next section.

Component	Description
1x RJ45 DMX512 input and 1x RJ45 DMX512 output	Receives and daisy chain the DMX signal to the next Speaker controller on the same universe.
Power input	12VDC/5A (60W) Power inlet for speaker controller.
16x RJ45 output to speaker	Connect to speakers and carry over data and 12V signals.
Main PCB	Hosting all components: the whole being referred to as speaker controller.

Each controller is controlling 16 speakers each with 5 addresses per speaker. A single controller gives out 80 addresses. The maximal number of controllers linked to a universe should be 4, for a maximal number of 320 addresses (64 speakers), even if an universe could contain a maximum of 512 addresses. That limitation has been decided for safety reasons. Even if you are not using every port of a controller it will react as if using a total of 24 addresses.

The sequence of the ports of the controller is important and are as shown periodically on the faceplate. The correct port # for a specific cable/speaker is denoted on the ethernet cable label.



The data for the controllers will be received by the DMX512 IN port. The IN port is located next to the 12v power input, while the OUT port is on the far side of the controller. The first controller of a universe will always receive the data first, connected via the DMX controller's OUT port and speakers controller's IN port. Then, we daisy chain from the first speaker controller to the second one, connected via the first controller's OUT port and second controller's IN port. Then will then feed to the next controller in the order from its output.

The power then is plugged in by way of an IEC plug on the back of the controller, and can be toggled by a powerswitch.

NEVER COVER UP THE VENT AT THE BACK OF THE METAL BOX

Labeling of speaker controllers

The speaker ethernet cables will all have a unique label on two parts of the installation: one label will be placed just past the attachment point of the speaker on the aircraft cable, while a second will be placed near the plugging point of the speaker controllers.

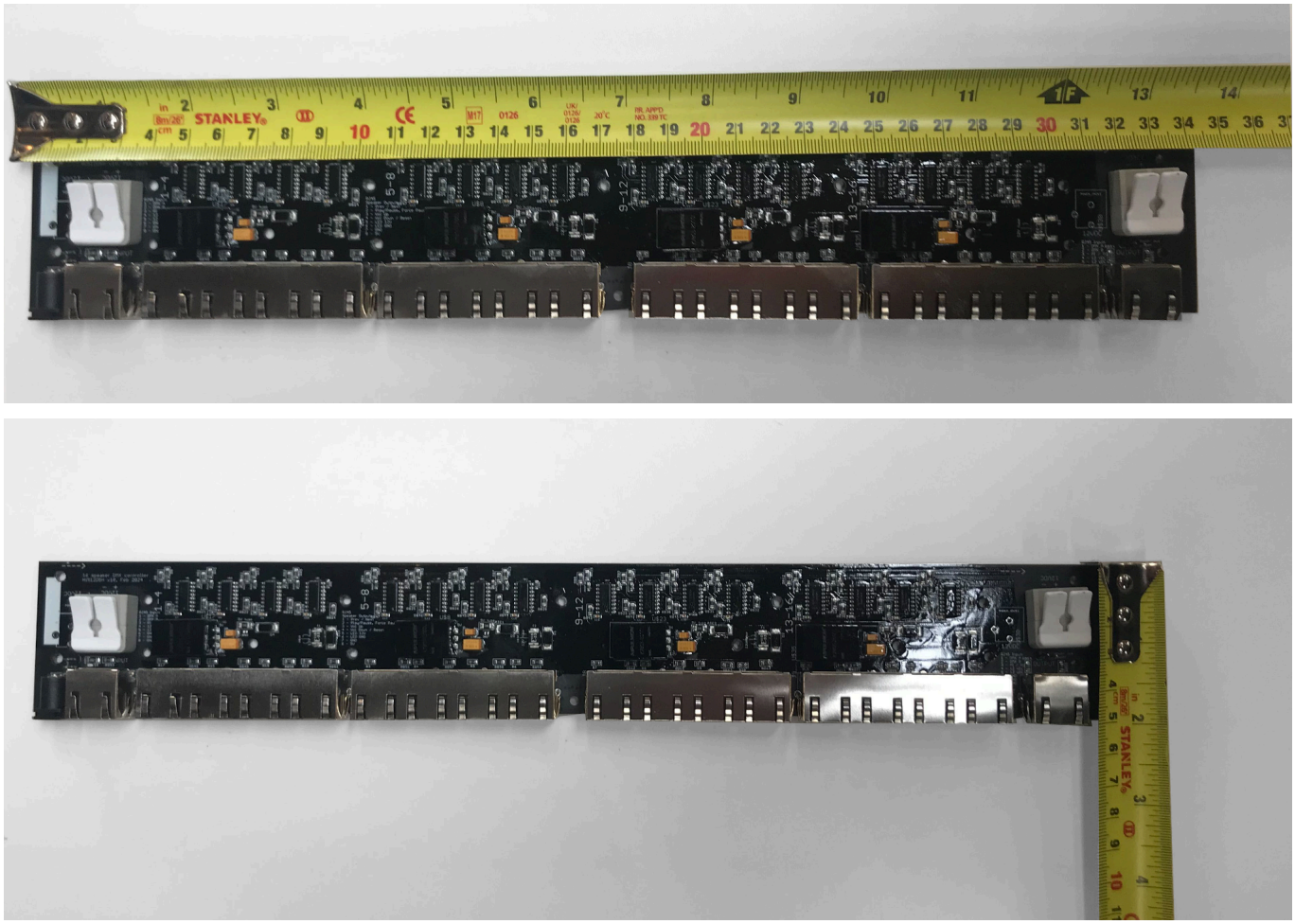
The labels read as such:

Controller ID# | Universe# - DIP Switch ID - DMX start address
Eg: 001 | 01 - 001 - 001

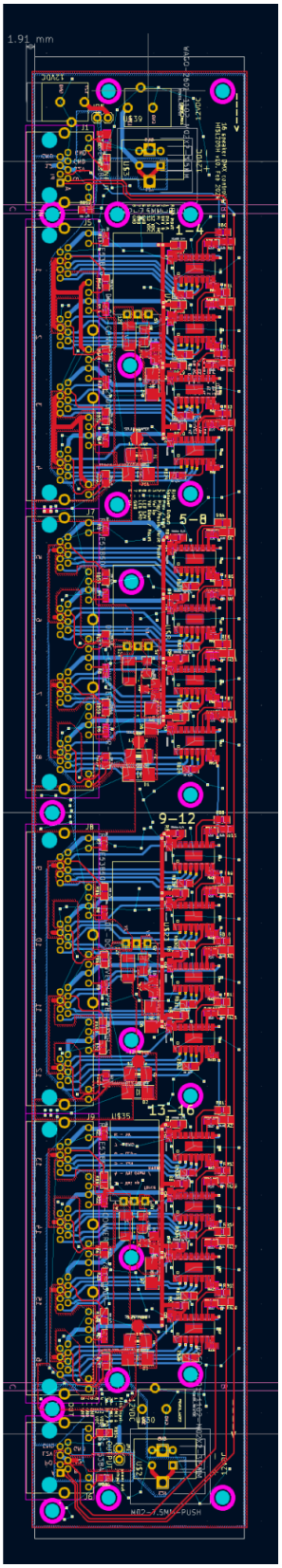
Component	Description
Controller ID#	Current Controller ID#. This is used to simplify the cabling connection between speakers and controllers. Each controller should have an unique ID. Values will range from 001 to 999.
Universe#	Exhibition's space Column Id on which the speaker is installed. Values will range from 01 to 99.
DIP Switch ID	Refers to which Speaker controller ID the cable (speaker) should be connected. Values will range from 01 to 15.
DMX start address	Refers to which RJ45 port of the Speaker controller ID the cable (speaker) should be connected. Values will range from 001 to 512.

Speaker Controller's Main PCB

The main PCB has been designed by the studio. The latest version of such PCB is labeled as Speaker Controller v10 - Feb 2024. The main PCB is controlling the power feed to the speaker's power line and, by extension, their on/off state. The board has 16 onboard chips, each controlling 5 outputs for a total of 80 channels.



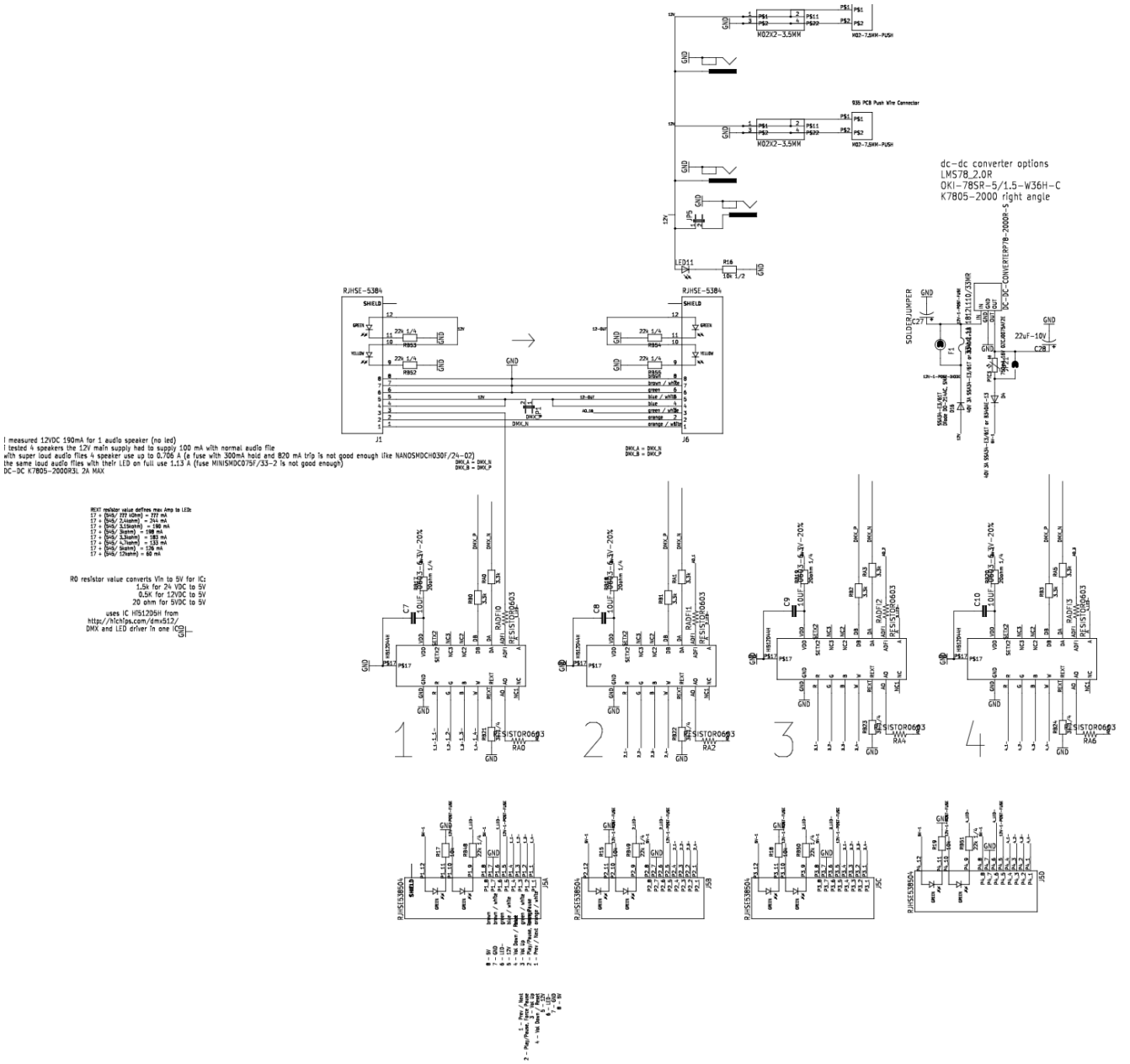
Main PCB



Board circuitry

Schematics

For ease of viewing the schematics have been broken up into sections of four.



SOLDERJUMPER
GND
22uF-10V
DC-DC-CONVERTER78-2000R-5
9
10
11
12w
RESISTOR0603
RJHSE538504

SOLDERJUMPER
GND
C5
22uF-10V
C6
DC-DC-CONVERTERP78-2000R-5
13
14
15
16
C20
C21
C22
C23
10UF-6.3V-20%
RADF12
RADF13
RADF14
RADF15
RESISTOR0603
RA24
RA26
RA28
RA30
RJHSE538504
J9A
J9B
J9C
J9D

Speaker Controller's Power supply

The power for the unit comes from a class 2 power supply. We can recommend the following unit for this artwork. That said, other units could be used, here are the most important specs for this unit:

Specification	Details
Manufacturer	Meanwell
Model Number	LPV-60-12
DC Voltage	12V
Rated Current	5A @ 12VDC / 1.2A @ 115VAC / 0.7A @ 230VAC
Rate Power	60W
Output plug	Barrel connector Inner diameter: 2.1mm Outer diameter: 5.5mm Barrel length: 11mm Polarization: Positive center, negative sleeve

DMX controller

The DMX controller will carry over the playback commands from the computer to the controllers.

In the current version, an Artnet to DMX controller- TitanA16 (16 ports) has been used. Controlled by the computer via ArtNet protocol, the device transfers the commands to the speakers as DMX signals. Each port is numbered and that number corresponds to the universe number.

Colordreamer

ARTNET to DMX Controller

TITAN A16

2Versions are available: Titan A8 and Titan A16

Thank you for purchasing the Colordreamer Titan Artnet to DMX Controller!

Our manual will describe the installation and mounting of the product as well as description of how to use it.

Please read and understand this manual in its entirety before using the product.

Package Contents:

1XTitan

1XPower Cord

1XRJ 45 Cable

1XThis Technical Manual

www.colordreamer.com Email:info@colordreamer.com Version:V1.0 Feb 2022

Products and specifications are subject to change without notice

Colordreamer

Product Overview

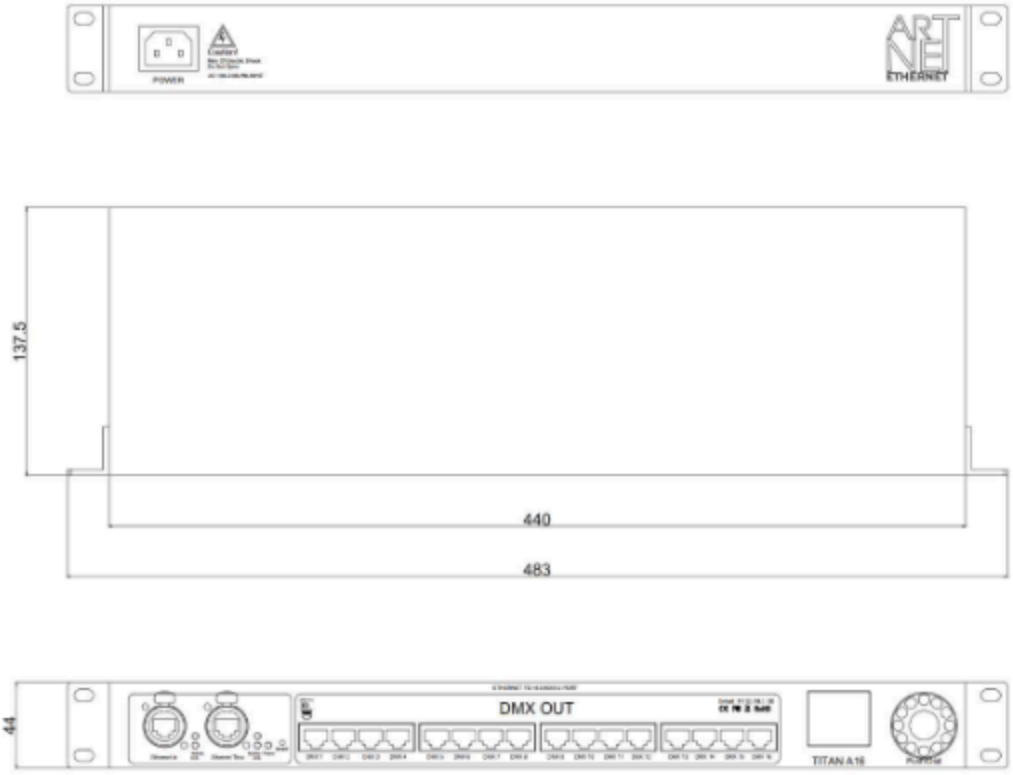
Colordreamer Artnet Controller converts Art-Net data from Ethernet network to DMX512.
Colordreamer Titan Family Artnet Controller has 8Universes (Titan A8) and 16Universes (Titan A16) available.
Adjust settings and address via the onboard oled screen menu or web browser.
Perfect synchronization between each Universe.
Take full advantage of pixel mapping and voxel mapping, easy to install.
The Artnet controller device is ready within seconds after start-up. An HTP Merge is automatically available for two Art-Net sources. If required, you can access and change specific device settings using the built-in web configuration tool.

Product Specification

Models	TITAN A8	TITAN A16
Electrical		
Input Voltage	100-240VAC 50/60Hz	100-240VAC 50/60Hz
Power Consumption	5W	5W
Control		
Network Protocols	Art-Net via ethernet	Art-Net via ethernet
DMX Outputs	8X512 DMX Channels	16X512 DMX Channels
Ethernet	RJ45	RJ45
Default IP	192.168.1.100	192.168.1.100
Default Subnet	255.255.255.0	255.255.255.0
Physical		
Housing Material	Metal	Metal
Finish Color	Black	Black
Connector	3pin/5pin xlr female	RJ45
Dimensions(LXWxH) Body	440×136.6x44mm	440×136.6x44mm
Dimensions(LXWxH)Brackets	483×136.6x44mm(1U)	483×136.6x44mm(1U)
Weight		
Environment		
Operating Temperature	-10℃ to +50℃	-10℃ to +50℃
Storage Temperature	-20℃ to +70℃	-20℃ to +70℃
Humidity	0-80% non-condensing	0-80% non-condensing
IP Rating	Dry, Indoor IP20	Dry, Indoor IP20
Certification and Safety		
Certification	CE	CE
Warranty	2Years Limited Warranty from the Date of Manufacture Contact us if you need extended warranty	

Dimension

(Titan A16)

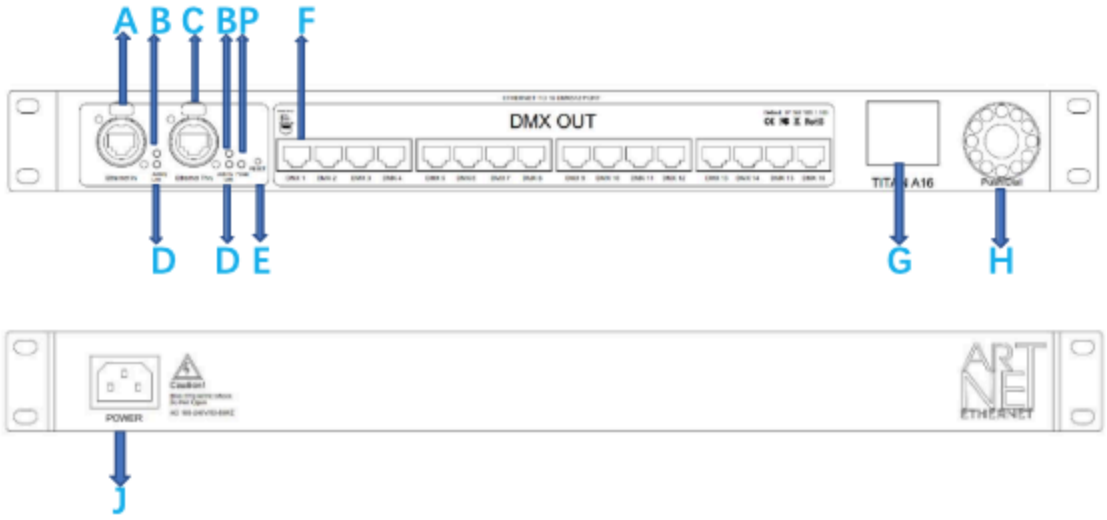


www.colordreamer.com Email:info@colordreamer.com Version:V1.0 Feb 2022

Products and specifications are subject to change without notice

Connectivity

(Titan A16)



A: RJ45 Ethernet in Port
B: Status LED for Ethernet Activity
C: RJ45 Ethernet thru port
D: Status LED for Ethernet Link
E: Reset Button
F: DMX Outputs
G: Oled Screen
H: Push/Dial button
J: Power Socket
P:Status LED for Power

Description of Status LED:

E: Status LED for Power

Status	Description
Powered Off	Power cable not connected. The device has no power
Permanently Green:	Connected to Power. Power is on.

D: Status LED for Ethernet Link

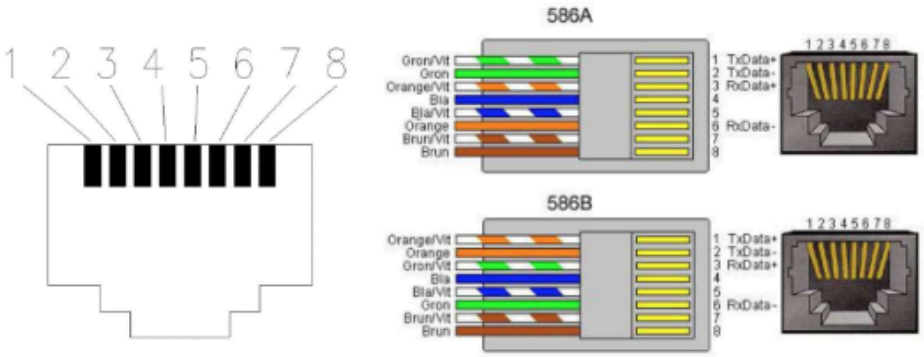
Status	Description
Powered Off	Ethernet not connected
Permanently Red:	Connected to ethernet

F: Status LED for Ethernet Activity

Status	Description
Powerer Off	No data received over ethernet
Permanently Green or Blinking Green	Communicating over Ethernet. Receiving data over ethernet

3-Pin And 5-Pin XLR Connector Layout

RJ45 Connector Layout

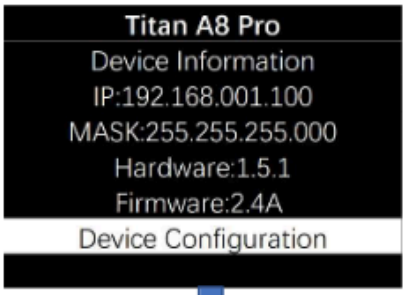


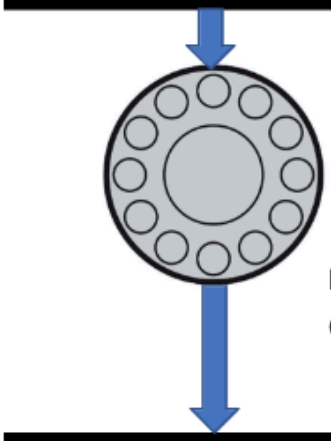
1: DMX+ 2: DMX- 7: Ground

Device Configuration Through onboard Screen and Push/Dial button

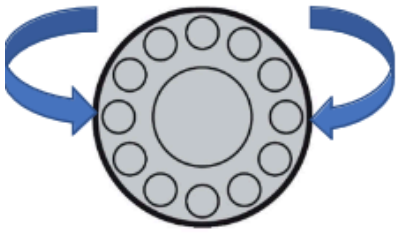
Standby Screen:

When you are not performing a task within a menu, Titan A8 or Titan A16 will display device information as below.

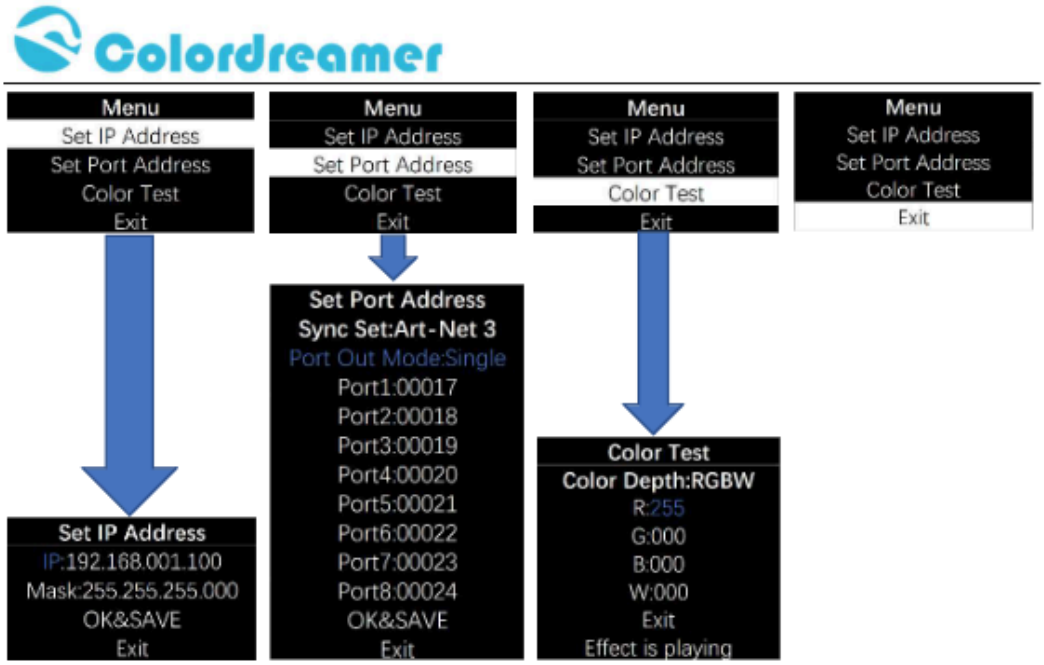




Press and release the rotary dial to enter the Device Configuration Menu.



Rotate the dial clockwise or counterclockwise to move between the highlights.
Press and release the dial to enter the page of highlight



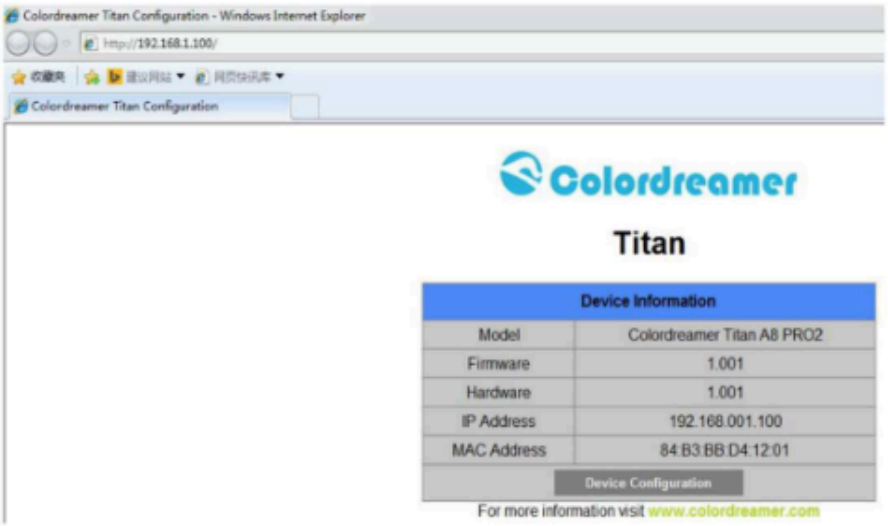
Rotate the dial to move the highlighted cursor between options within the page
When the highlighted cursor is over the required option, press and release the dial
Rotate the dial to change the value of the option.
Press and release the dial to fix the chosen value of the option.
Remember to press “OK&SAVE” to confirm your setting.
Press “Exit” to come back Main Menu.

Notes:

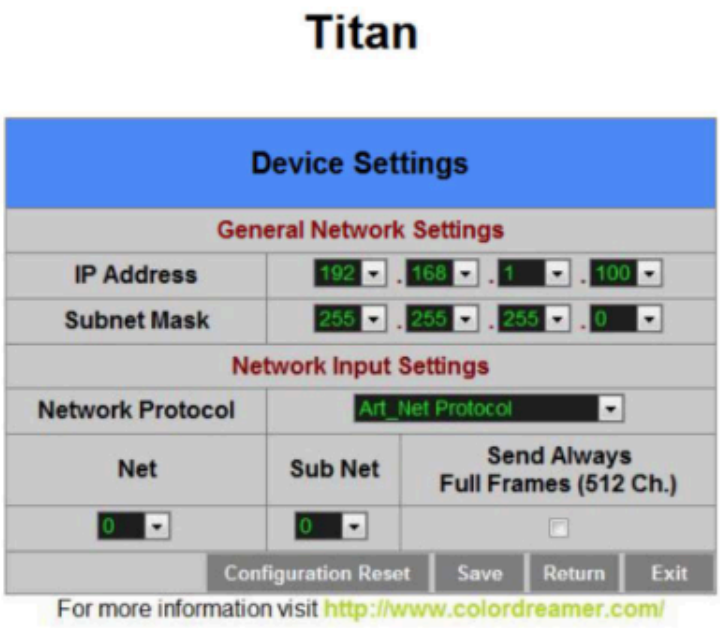
1: In the page “Set Port Address”, Sync Set can be Art-Net 3 or Art-Net 4
2: User can use Color Test Page to test your led fitting when software is not ready.
Color DepthW/RG/RGB/RGBW
R: a value between 0-255 G: a value between 0-255
B: a value between 0-255 W: a value between 0-255

Device Configuration Through a Web Browser

You can access all settings and information of Titan Artnet Controller by using the built-in web configuration tool.
Step 1) Connect Titan Artnet Controller and your computer to the same network.
Artnet Controller Default IP 192.168.1.100
Step 2) Assign correct network settings for your computer in the operating system. (Recommended default settings:
IP address 192.168.1.XXX/ Subnet mask 255.255.255.0)
Step 3) Open your web browser and enter the IP address of Artnet Controller 192.168.1.100
Step 4) The web configuration tool will be launched.



Step5)You can change IP address and save this configuration



Step6） After saving all setting,reboot the system to apply the new setting.after reboot,this window will be closely automatically.

Titan

For more information visit www.colordreamer.com

Reset to Factory Default Settings

Step 1) Disconnect the device from power.

Step 2) Use a suitable tool to press the reset button.

Step 3) Continue to press the reset button and connect to power again.

Step 4) Continue to press the reset button and wait until all status LEDs of the device flash repeatedly or wait 5 seconds.

Computer and software

At the time of writing this manual, the softwares operating on the computer is coded under TouchDesigner's platform, version 2023.11340. Such softwares were initially released and tested on a Windows 10 computer, using an NVIDIA RTX 3060, 16GB of RAM and 512 GB of storage.

The softwares SendingDmx.toe and RippleFX.toe are launched, in such an order, by the Windows Task Scheduler, and delays the software launch to allow all system resources to be loaded in priority. A service is always running behind called Axis Streaming Assistant and allows the security cameras to be captured by the software.

Cameras

The piece uses two Axis P3265-LVE cameras which can be accessed through their IP addresses and modifications to the settings of those can happen through the web browser.

A PoE network switch model AXIS T8508 is used to connect the cameras.

Specification	Details
Camera	Axis P3265-LVE 3.4 - 8.9mm
PoE Switch	Axis T8508
Resolution	1920x1080
Frame Rate	50/60fps
Sensor	CMOS 1/2.8
Focal length	3.4 - 8.9 / 9 - 22 mm
Horizontal field of view	100-36 / 35-15 °
Vertical field of view	53-20 / 19-9 °
POE class	Power over Ethernet Plus (PoE+) IEEE 802.3at Type 2 Class 4

Cameras' network configuration

To be recognized by the system, the following IP assignment should be respected.

Name	IP address	Serial number
AXIS T8508	192.168.1.254	B8A44F857FD4
AXIS P3245-LVE	192.168.1.40	B8A44F4EB9F0
AXIS P3265-LVE	192.168.1.35	B8A44F3B905E

Background software

Axis Streaming Assistant is a service running in the background to transform the camera feed into a discoverable USB webcam. The naming convention [Channel] is important to be recognized by the other app. The image below shows a screenshot of the software running normally.

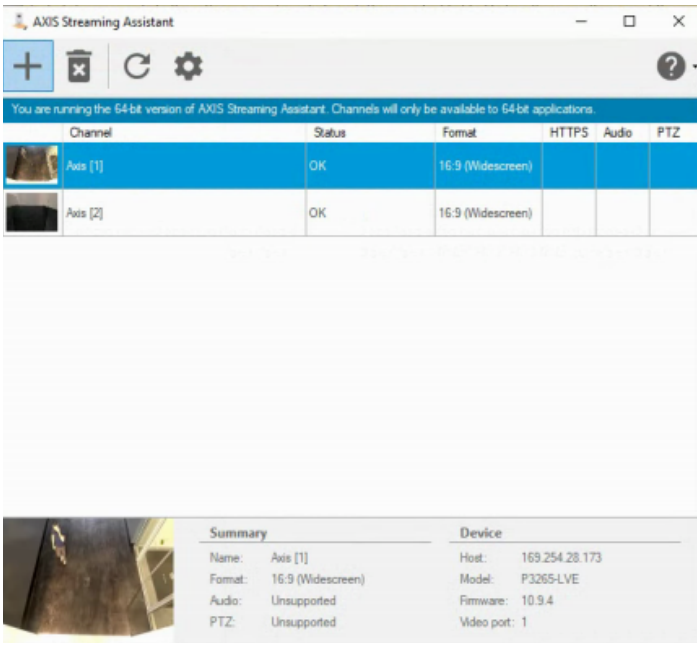
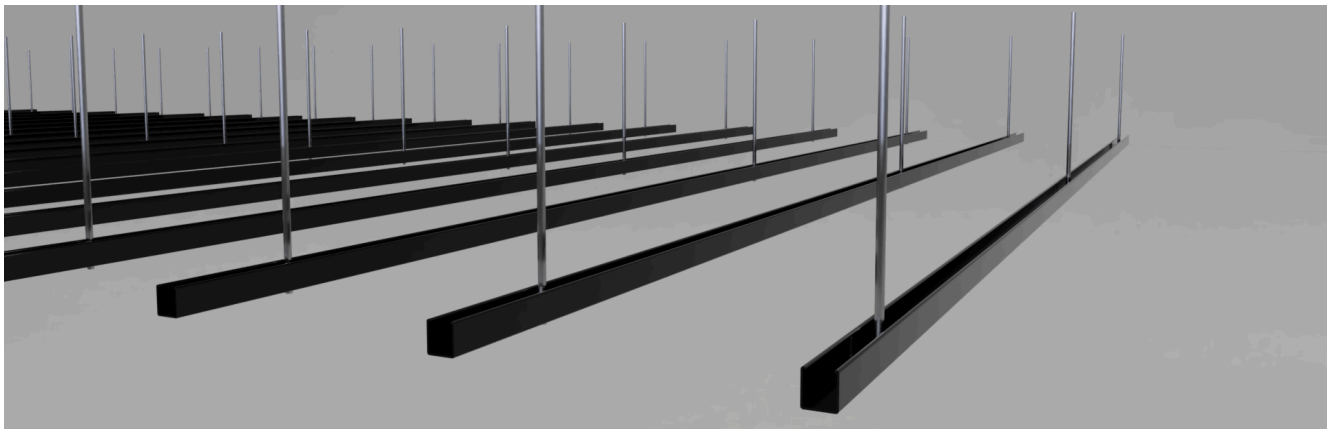


Image of Axis Streaming Assistant functioning well

APPENDIX III - SUSPENSION OF SPEAKERS IN THE EXHIBITION SPACE

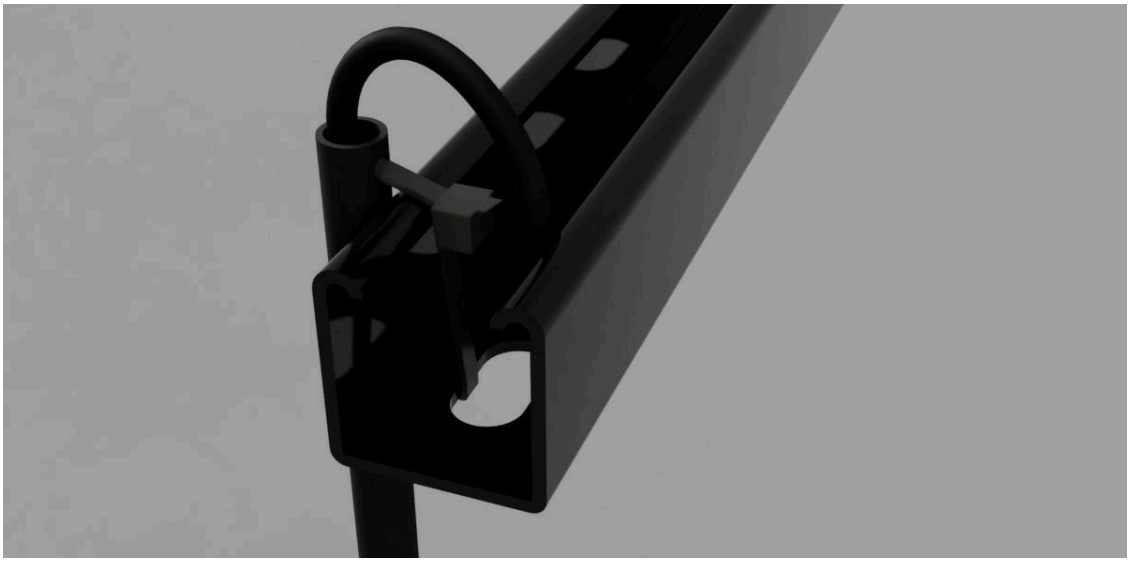
The rigging points for the piece are inset into the ceiling with threaded rod in rated plugs installed by northwest electrical. The rods come down 20cm where they attach to the Unistrut.

NOTE: Rigging has inherent dangers associated with it, always use a certified professional when installing things above the heads of others.



The Unistrut is capable of holding 13 speakers at various heights but should not be used to carry human weight, never hang off the unistrut as it can twist and deform.

Pre-measured wires are then run into measure plastic channels which are secured by a zip tie to the unistrut and another zip tie to keep the channel closed securely.



The cables then run to a cable tray above the unistrut channels, which are secured separately to the ceiling. The cables run down the cable tray cleanly before entering a 2” diameter pipe that leads into the upper ceiling of the control closet

The controllers will have a universe denoted on them, from the Titan 16 run an ethernet to the first box in the group of four.

APPENDIX IV - LIST AND LABELS OF SOUND CATEGORIES

Besides the common files, the sound files provided with the work are bundled into 5 different categories. These categories are as follows:

Category letter	Type of Sound	Amount of available tracks
A	MDN Scrape	63
B	Rice Community	138
C	Community Partners	31
D	Archival	129
E	MDN Scrape 2	121