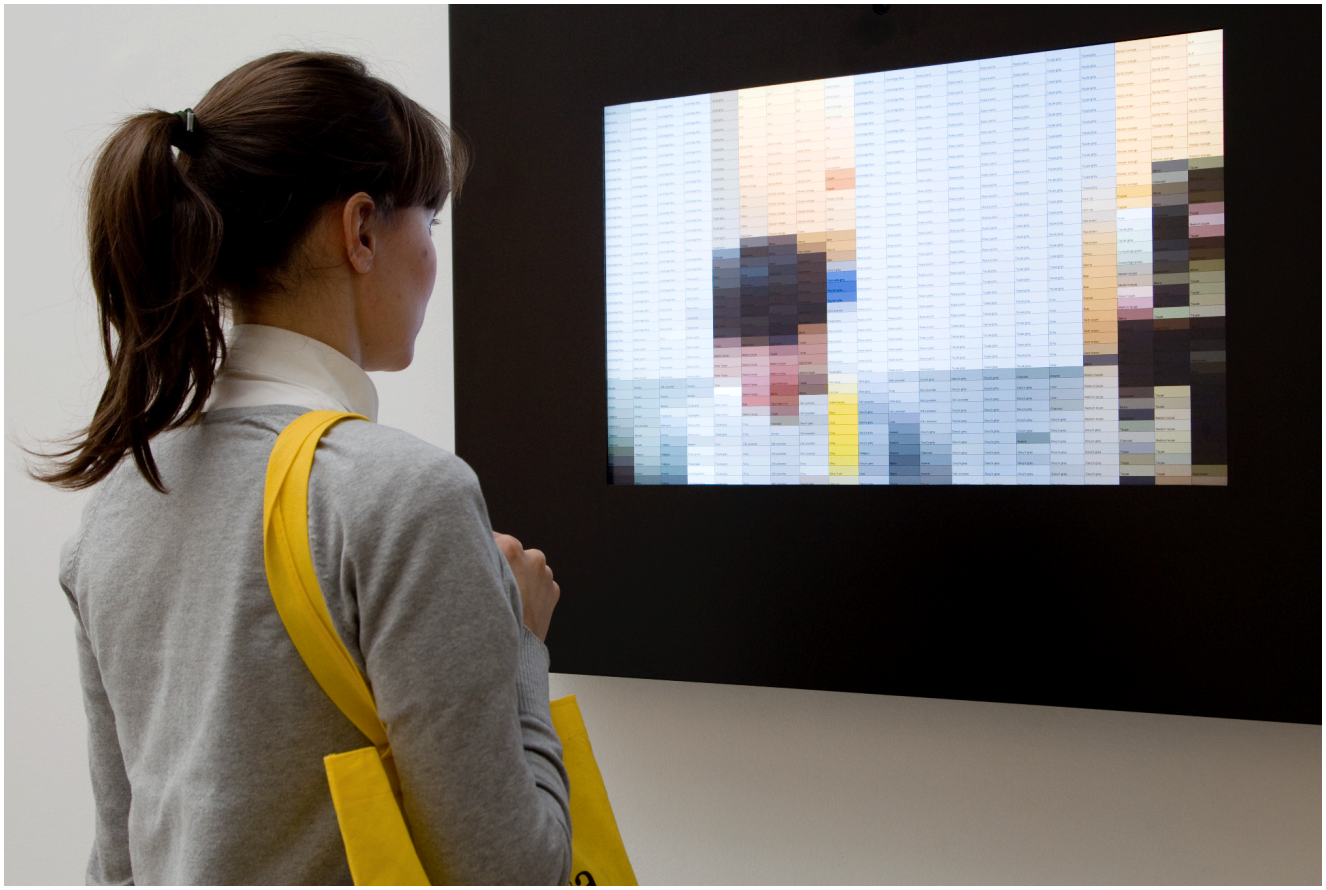
THE COMPANY OF COLOURS, SHADOW BOX 9

BY RAFAEL LOZANO-HEMMER - MIGRATION 2026



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GENERAL IMPORTANT INFORMATION

This short section must be read for proper operation.

THE COMPANY OF COLOURS, SHADOW BOX 9 (2009)

BY RAFAEL LOZANO-HEMMER

Technique

High resolution interactive display with built-in computerized surveillance system: computer, camera and display.

Description

"The Company of Colours" (Shadow Box 9) is the ninth piece in the Shadow Box series of interactive displays with a built-in computerized tracking system. This piece shows a live surveillance camera view constructed out of a palette of named colour swatches that can be rendered by contemporary computers. Every few minutes the piece automatically switches to show the live view constructed with a variety of culturally-significant colour palettes from computer and video game history, including the 4 shades of green of the original Nintendo Gameboy, the eight colours of teletext, and the sixteen colours of the Commodore 64, the Apple II and the ZX Spectrum. The piece emphasizes the limited gamut of colour rendering possible with computers and the way this limitation creates styles of representation.

Dimensions and Weight

The exact weight of the entire artwork can’t be easily estimated. The camera would typically weigh between 0.1 and 0.3 kg, the computer would weigh up to 1.5 kg and the display would typically range between 15 and 50 kg. Always verify your components specifications before hanging any elements.

Power Requirements

The computer and camera should require up to 75W. For the display, please refer to the specifications of the model you are using. All the components should easily be operating on 110V or 240V.

Operation

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

1. Connect all the elements to a power source as shown in the installation's wiring diagram.

2. To turn the piece ON, press the power button of the computer for a second then release it. Important note: 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. After 2 minutes (maybe faster), you should see the piece.

3. 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 more than 2 seconds).

4. If the piece doesn't start within 2 minutes, try to turn on the piece again. If it still doesn't turn on, then hold the power button all the way down for 10 seconds. Then, wait at least 3 seconds and press the power button all the way down for 1 second and you should be up and running again.

General Artwork Behaviors

The display shows a Named colours view, the live camera feed rendered as a low-resolution pixel grid using a palette of named colour swatches supported by modern computers. Every few minutes the piece automatically switches to show The Media colours view, the live view constructed with a variety of 16 culturally-significant colour palettes from computer and video game history, including the 4 shades of green of the original Nintendo Gameboy, the eight colours of teletext, and the sixteen colours of the Commodore 64, the Apple II and the ZX Spectrum. Said colour palettes are shown for a certain amount of time, before returning to the Named colours view.

Interacting with the Artwork

As someone walks in front of the piece, their presence alters the camera feed. Their silhouette interferes with the grid, causing the displayed colours, and the corresponding colour names to shift.

Maintenance

Please do not clean the camera or the display surfaces with Windex or soap. Use a lint-free cloth and LCD screen liquid cleaner, such as Kensington Screen Guardian found in most computer stores. While cleaning the camera, avoid applying too much pressure onto its surface, otherwise

the camera could swivel. Do not use harsh cleaners or rough sponges. We recommend cleaning the piece at least every two months.

Placement Instructions

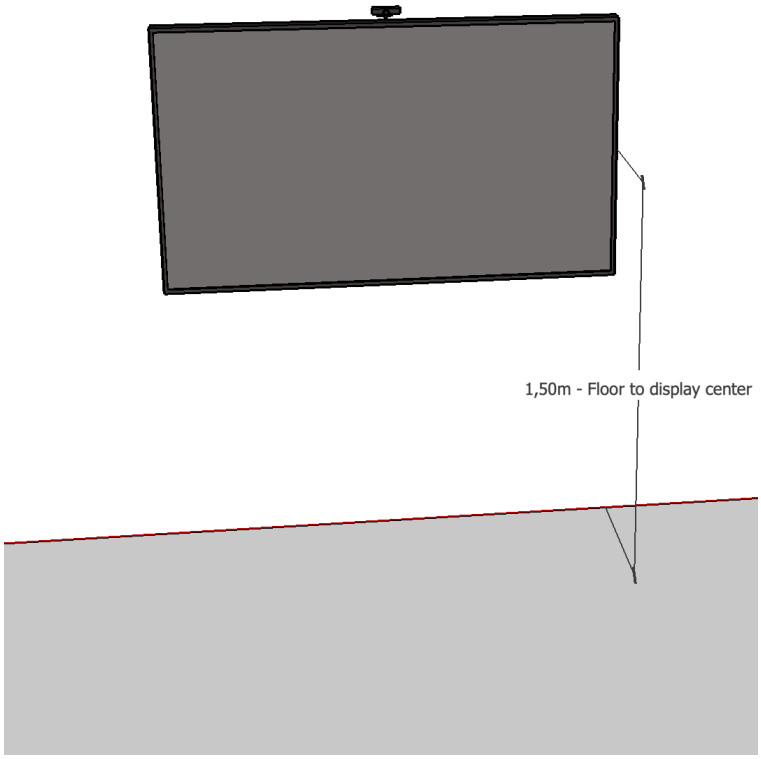
This artwork is made up of 3 main components: the display, the computer and the camera. You should begin by screwing your display mount into the wall, ensuring a stable mount for the weight listing.

The vertical center of the monitor should be hung at 150 cm (59 inches) from the ground. While setting your display on the mount, ensure you have access to the power cable and HDMI ports, then connect these to your computer.

The camera should be installed above the monitor, horizontally centered, floating above it, pointing at people standing in front of the display so they clearly see themselves like in a mirror. Ensure that the camera is secure.

The computer can be installed in different locations: in the wall, behind the display, in a ventilated cabinet located nearby the display, etc. If any cabling is visible, it should be considered to hide it within cable channels or similar solution.

It is advisable to light the interactive area in front of the piece with fixtures that have a daylight-like colour temperature.



Mounting the Camera

The camera and its bracket should be installed behind the display so that only the top of the camera is visible. Ensure that the camera lens is slightly angled downwards as seen in the photo below.

The goal here is to get a situation where someone 1.8m tall, standing at 2m away from the display, has the top of the silhouette's head rendered just below the display's top edge.

Refer to the documentation given apart from this manual for more details.

DETAILED TECHNICAL INFORMATION

Normal Software Operation

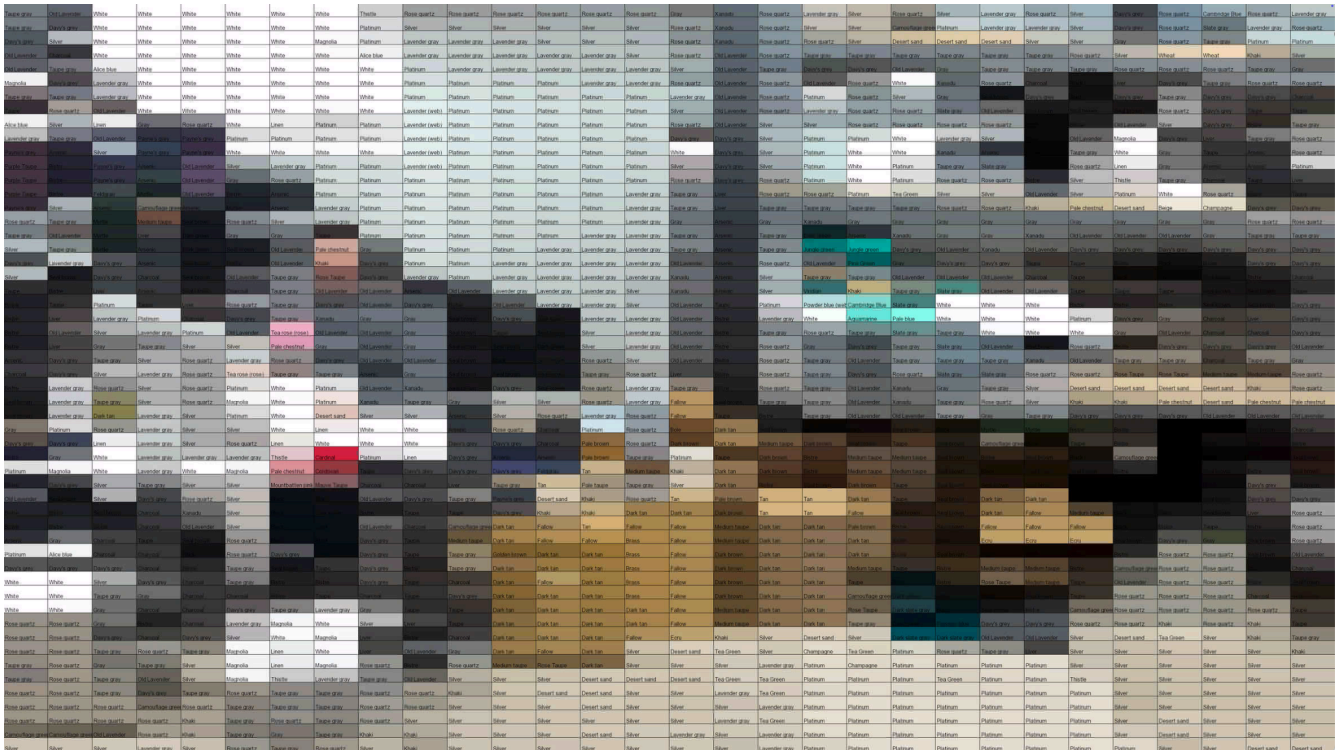
The artwork is set to automatically start when the computer is powered on and the computer is typically set to reboot daily, at night. We do recommend turning off the artwork when you don't plan to look at it for a longer period of time, to extend the lifetime of the components.

At the time of writing this manual, the artwork's software is coded under openFrameworks' platform v0.12.0 and the software version referred to in this manual is v 4.0.

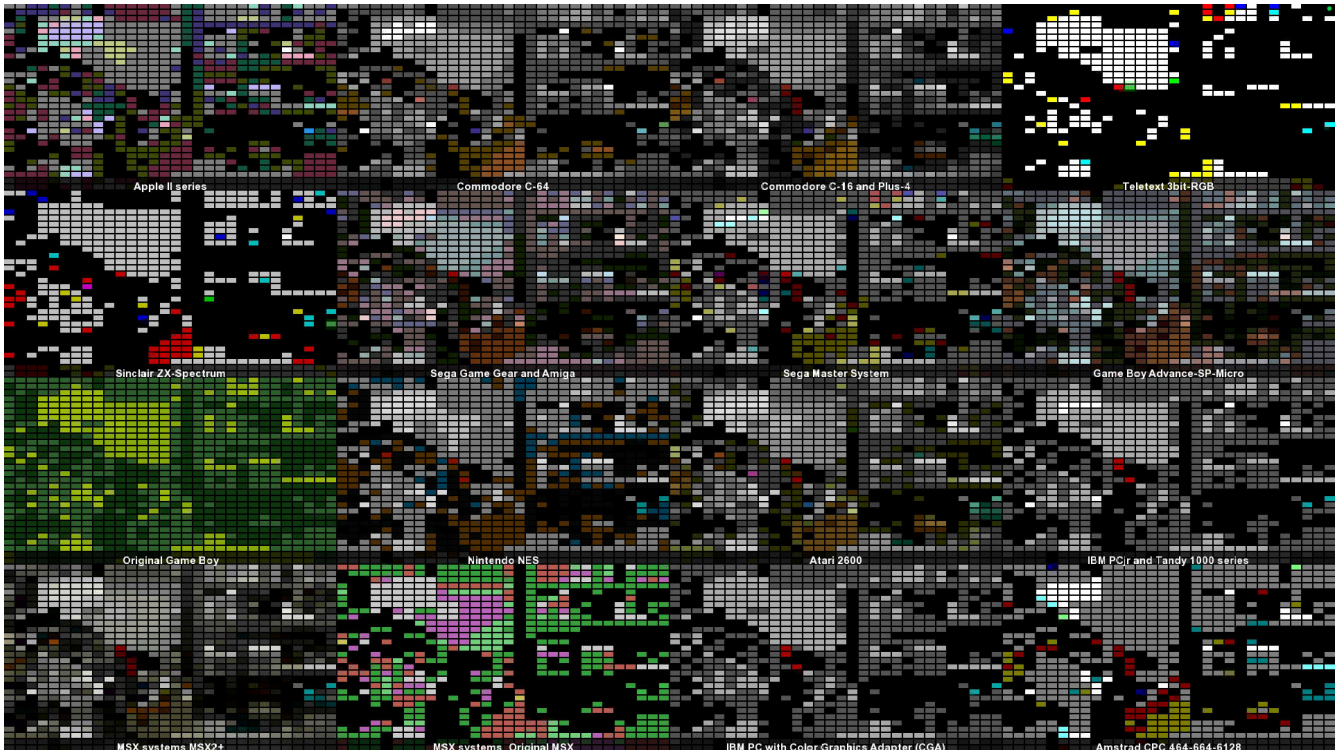
The software runs on an Apple computer on at least OSX 15.4.1. Such software was initially released and tested on an Apple MacMini with an M4 processor, 16GB of RAM and 256 GB of storage.

The software is launched, after the computer's logon, by the custom-made software delayOpen.app that, as the name implies, delays the software launch to allow all system resources to be loaded in priority.

The software alternates at a steady rhythm between the Named colours view and the Media colours view. The display should therefore present these two distinct modes as represented below.



Named colours view



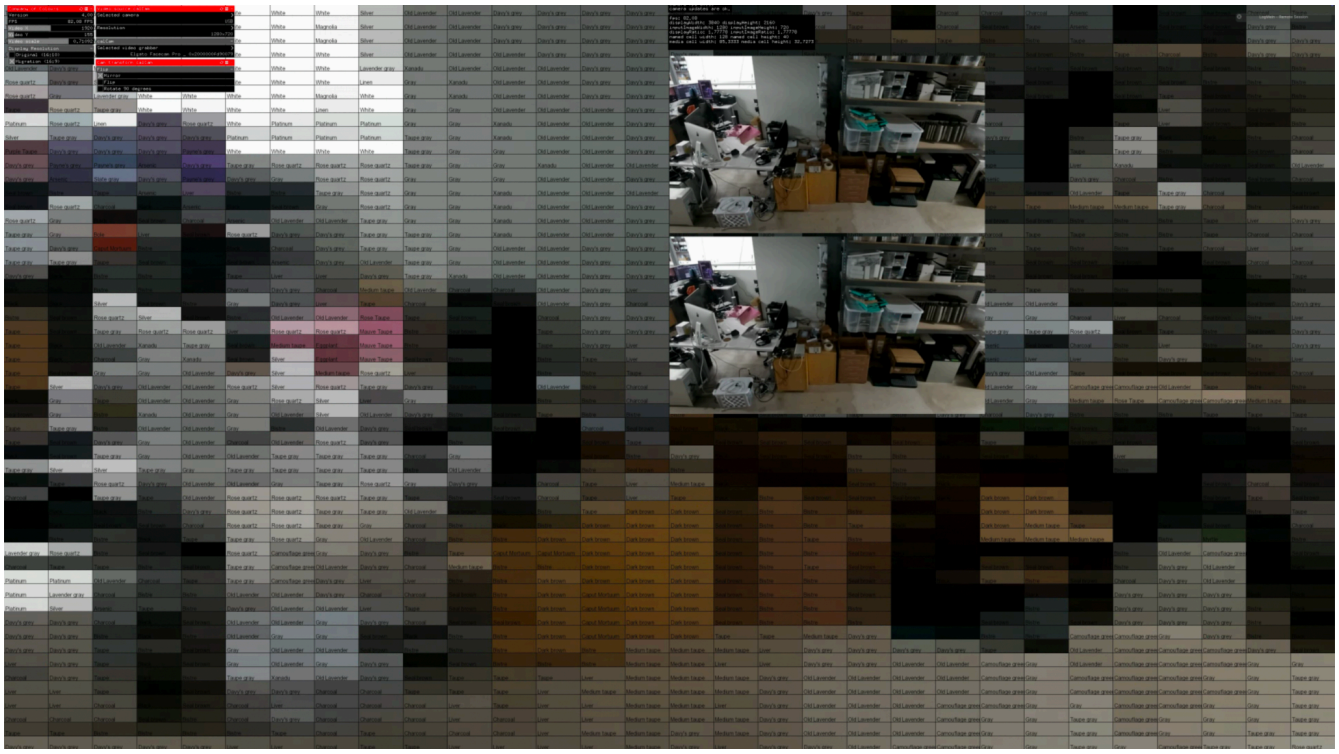
Media colours view

Manual Software Calibration

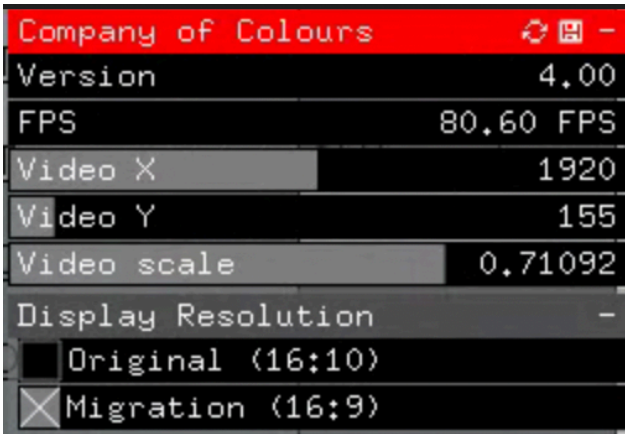
The software has a GUI function that can be accessed by pressing in the **u** key on the keyboard. Pressing the “Escape” key will quit the software. **Be very careful when opening this GUI,** it controls everything and if the GUI is closed (pressing the **u** key again) it will save the changes made to it.

If you open the GUI within the first 10 seconds after the software starts, the cursor may disappear. To restore it, close the GUI and reopen it.

The displayed menu shows you settings and info in the left part of the display, info about camera and the software near the top center of the display, then the live and transformed camera feeds below the info panes (this can be adjusted).



Company of Colours - Main Settings

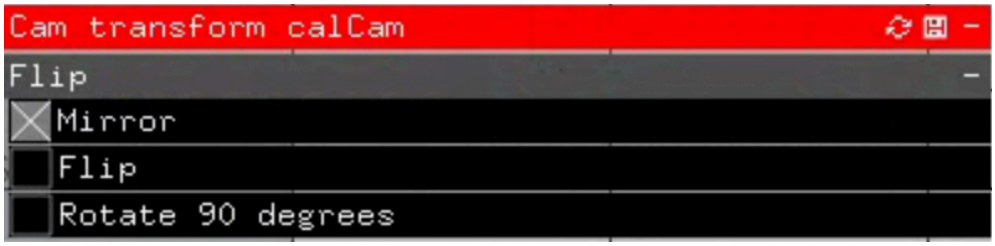


Settings	Description
Version	Displays the software version running.
FPS	Displays the overall frames per second rate of the software.
Video X	This slider lets you move the top left (in X - horizontally) anchor point for the live and transformed camera views.
Video Y	This slider lets you move the top left (in Y - vertically) anchor point for the live and transformed camera views.
Video Scale	This slider affects the render size of the live and transformed camera views. Value could go from 1 to 100%.
Display Resolution - Original (16:10)	Clicking this option will enforce the system to be displayed in the original artwork ratio (16:10). It impacts the different text font sizes, the number of rows and columns for each grid type (Named colours and Media colours). Suits perfectly the original display resolution of 2560 x 1600 pixels.
Display Resolution - Migration (16:9)	Clicking this option will enforce the system to be displayed in the original artwork ratio (16:9). It impacts the different text font sizes, the number of rows and columns for each grid type (Named colours and Media colours). Suits best resolution around 3840 x 2160, while compatible with higher resolutions with the same aspect ratio.

Video source

Settings	Description
Selected camera	Let you pick between USB and IP options. This feature is for future use. **Please keep it as USB**.
Resolution	Let you pick a camera resolution. While it can match the camera's full resolution, a practical guideline is to select a resolution around one-third of the display's resolution. For example, if the display resolution is 3840×2160, the camera could be set to 1280×720. This provides sufficient image quality for the software while improving framerate. However, setting the resolution too low may cause the FPS to become excessively high. Aim for a framerate between 30 and 60 FPS when configuring the resolution.
Selected video grabber	Let you pick between the different camera options: showing the possible camera names and IDs. This feature is for future use. **Unless you change the camera device, this should be kept as how we provided the artwork to you.**

Cam transform calCam



Settings	Description
Flip - Mirror	When checked, the camera view will be mirrored horizontally. The goal here is to have a display that reacts like a mirror. **Usually checked.**
Flip - Flip	When checked, the camera view will be flipped vertically. The goal here is to have a display that reacts like a mirror.
Flip - Rotate 90 degrees	When checked, the camera view will be rotated 90 degrees and compressed within the live viewer frame. **Keep unchecked.**

Remote Access to Artwork's Computer

There is a software installed on the computer running this artwork that allows the studio to connect remotely to the artwork. This feature is helpful when you require assistance from the studio, as we can remotely connect to it, do a quick inspection, and do a debugging session of your components, if needed. In order to enable this feature, the computer has to be connected to the internet at all times. Depending on the computer's operating system (Windows 7/8/10/11, OSX), the procedure to set the computer online will vary. Please look online for tutorials, if necessary.

Preliminary Troubleshooting Steps

After pressing the button, nothing seems to happen.

Do you hear any sound coming from the computer? If so, the computer is running and the projector should display the piece shortly. If not, check that the display is powered and try to turn it on with a remote control on its power button. Also, check that the display's source is set to the same port where the cable is plugged in — HDMI, VGA, DVI, etc.

The piece doesn't react to people in front of the artwork.

Ensure that the camera is well connected to the computer. Ensure the camera is properly angled towards the space, having no object obstructing its field of view. Ensure there is only one instance of the software running.

When changing the number of rows / columns of the Named colours grid, the software crashes.

When adjusting these values, to avoid glitches, ensure to uncheck the Show color names checkbox first, change the value to your liking, then close the menu, restart the software, open the menu, make the Show color names checkbox checked again and close the menu.

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:

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APPENDIX I - INSTALLATION

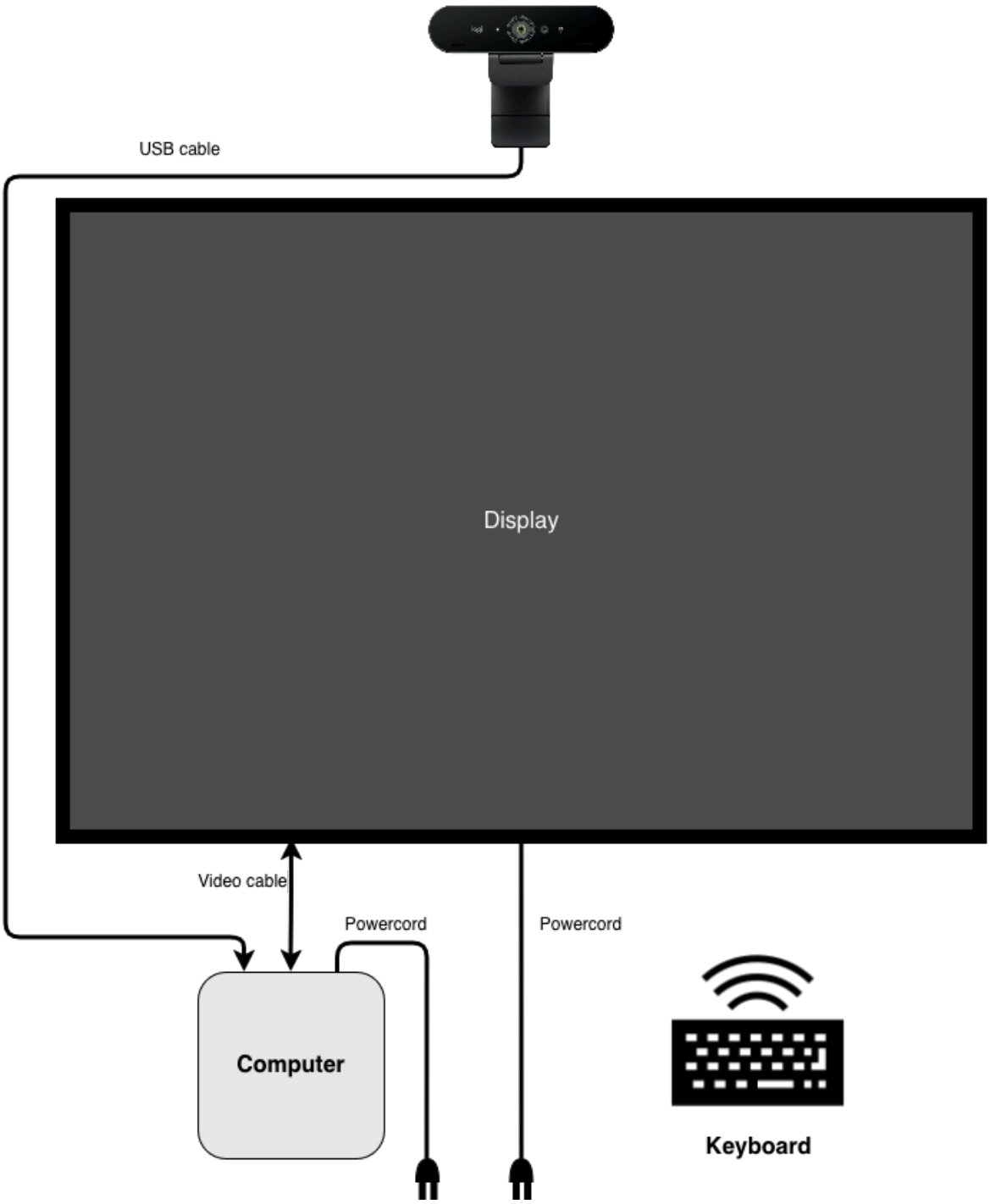
Description of Components

This artwork requires the following components:

Component	Description
Camera	This is the camera that allows the system to capture the view in front of the artwork. Usually it is a USB camera.
Wallmount for camera	Holds the camera above the display.
Computer	Typically an Apple Mac Mini (at least M2 running at least on OSX 15.4.1).
Wallmount for computer (optional)	A wallmount for the display could be provided if installation of the computer is planned behind the display.
Video Signal Cable	Connects the computer to the display. Usually it is an HDMI cable.
Display	Typically an UHD (4K) display of at least 55” of diagonal. Ideally the monitor would be as matte (non-reflective) as possible, as slim as possible with bevels as small as possible.
Wallmount for display	Anchors the display to the wall, levelled. The bracket should not have any tilt option (unless it is a more expensive unit able to lock the display position). If you plan to install the computer behind the display, an extension (depth adjustment) feature is desired as such a mounting bracket gives the leeway to do so.
Keyboard	While not required for normal use of the artwork, it allows you to calibrate the system based on your actual location.

Wiring Diagrams and Connections

In order for the piece to run properly, the computer should be connected according to the following diagram.



APPENDIX II - TECHNICAL DATA SHEETS

Camera

The camera used for this artwork is a typical USB device selected for specific features: at the time writing this manual, the Logitech Brio 4K and the Elgato Facecam Pro devices have been used with the software and approved by the artist.

Future software versions could rely on a different camera: here are the minimal specs to match or improve for an easier migration process. Also note that future versions could eventually use different camera types (NDI, network, etc).

Specification	Details
Resolution	3840 x 2160 @ 30Hz. In software, you would typically reduce the resolution to 1920×1080 or 1280×720; however, using a 4K camera ensures a more current device. If the camera supports 60Hz, this should slightly improve the artwork's rendering.
Color quality	Aiming for a camera able to deliver high contrast, vivid colors, able to deliver decent image quality in low brightness level environments. Keywords here: near-DSLR, HDR.
Field of View	A 90 degrees FOV value would be the best. With bigger displays, you may want to increase the angle for better coverage, while with smaller displays, you could go down to 78 degrees.
Mounting method	Should be paired with the provided camera wall mount method. Typically using a ¼-20 UNC thread present in the camera body.

Display

The original artwork was developed at a 2560×1600 resolution. As part of the software migration, current 16:9 display standards (Full HD, 4K, 8K) were taken into account. While no specific hardware model is required, minimum specifications are recommended to ensure optimal rendering of the work.

Specification	Details
Resolution	16:9 ratio, at least 3840 x 2160 pixels
Brightness	500 nits Recommended minimum for a living-room–type environment. If the artwork is installed in a brightly lit space or receives significant direct sunlight, a display rated at 1000 nits should be considered.
Refresh Rate	60 HZ or better
Contrast Ratio	At least 2000:1
Viewing Angle (H / V)	178° / 178°
Screen Surface	Non-glare surface - 30% haze level or lower being a good level.
Dimensions	At least 55” diagonal display.
Operation Time Support	Should ideally support 24/7 operation, to increase lifespan.