

BLOW UP, SHADOW BOX 9

BY RAFAEL LOZANO-HEMMER - MIGRATION 2026

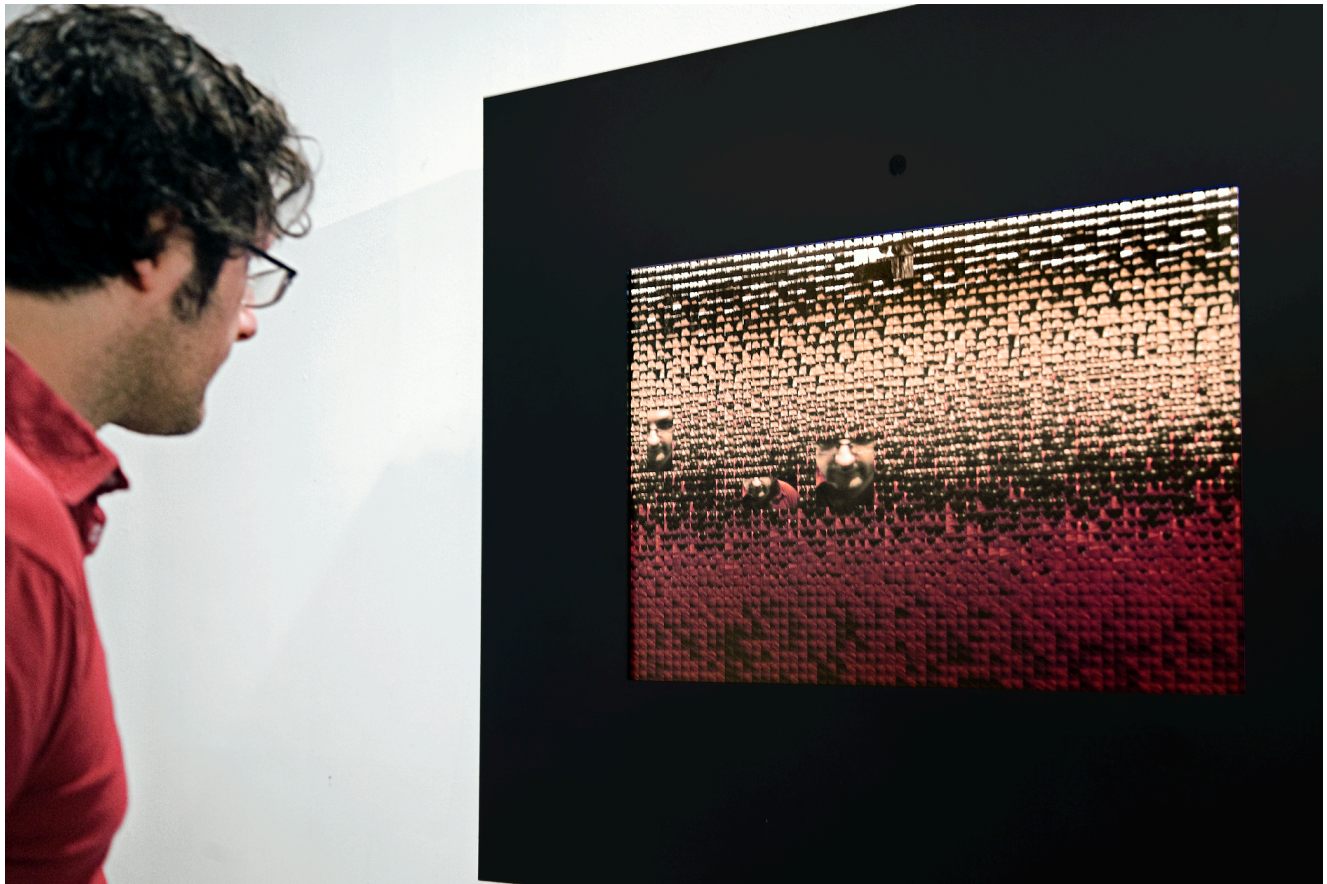


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GENERAL IMPORTANT INFORMATION

This short section must be read for proper operation.

BLOW UP, SHADOW BOX 4 (2007)

BY RAFAEL LOZANO-HEMMER

Technique

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

Description

"Blow-up" (Shadow Box 4) is a high-resolution interactive piece designed to fragment a surveillance camera view into 2400 virtual cameras that zoom into the exhibition space in fluid and autonomous motion. Inspired by 20th-century Italian filmmaker Michelangelo Antonioni, the piece is intended as an exercise to underline the construction of presence through a simulated, live compound eye.

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 for a maximum of a second. The 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 the camera's field of view fragmented into a large number of virtual cameras — up to several thousand — which are stitched together: the stitched views combine into a continuous image, reproducing the full camera feed and creating a mirror-like effect.

Each virtual camera frame is separated by a thin border to emphasize the uniqueness of each virtual camera. The software periodically varies the number of virtual cameras, their distribution (number of rows and columns), and the number of "large cells" (groups of virtual cameras merged together, breaking the regularity of the grid layout).

Interacting with the Artwork

When a protagonist enters the camera's field of view, the tracking system detects and follows them. If the target is close enough and occupies a significant portion of the frame, the artwork displayed becomes disrupted: all virtual cameras then zoom in and lock onto a focal point in or near the tracked subject, each with its own zoom level and anchor point.

When the target leaves the camera's field of view or has been tracked for too long, the system stops tracking, reconfigures the virtual camera arrangement, then becomes ready to track a new target.

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

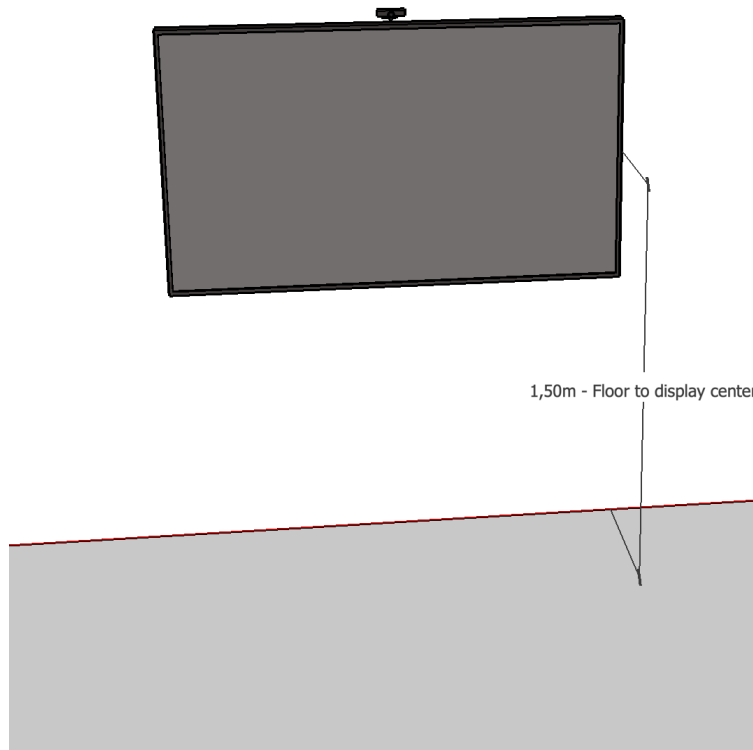
This artwork is made up of 3 main components: the display, the computer and the camera. You should begin by screwing your display mount into the wall, ensuring a stable mount for the weight listing.

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 3.11.

The software runs on an Apple computer on at least OSX 26.3.1. Such software was initially released and tested on an Apple MacMini with an M4 processor, 16GB of RAM and 256 GB of storage.

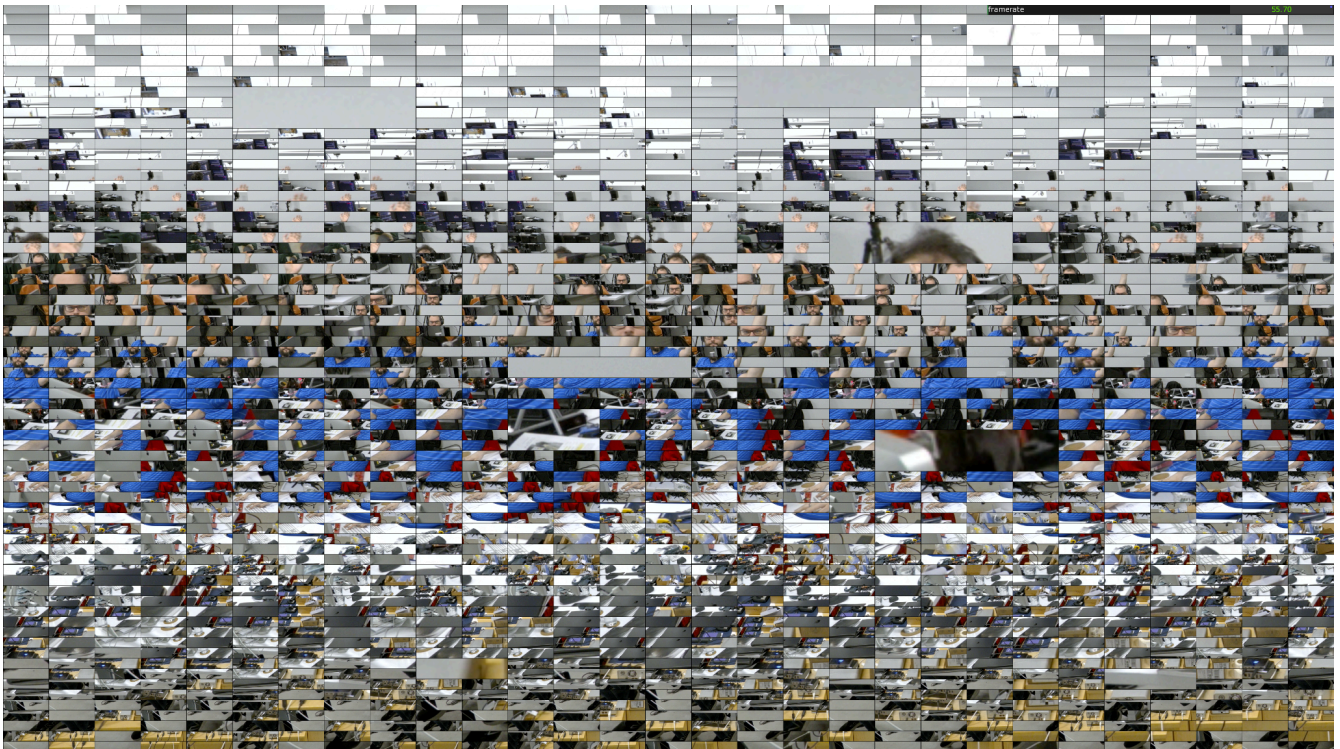
The software is launched, after the computer's logon, by the custom-made software `advanced_automator.app` that, as the name implies, delays the software launch to allow all system resources to be loaded in priority.



Artwork rendered when no one disturbed the camera view (1)



Artwork rendered when no one disturbed the camera view (2 - different layout)



Artwork render with a protagonist in front of the artwork

Manual Software Calibration

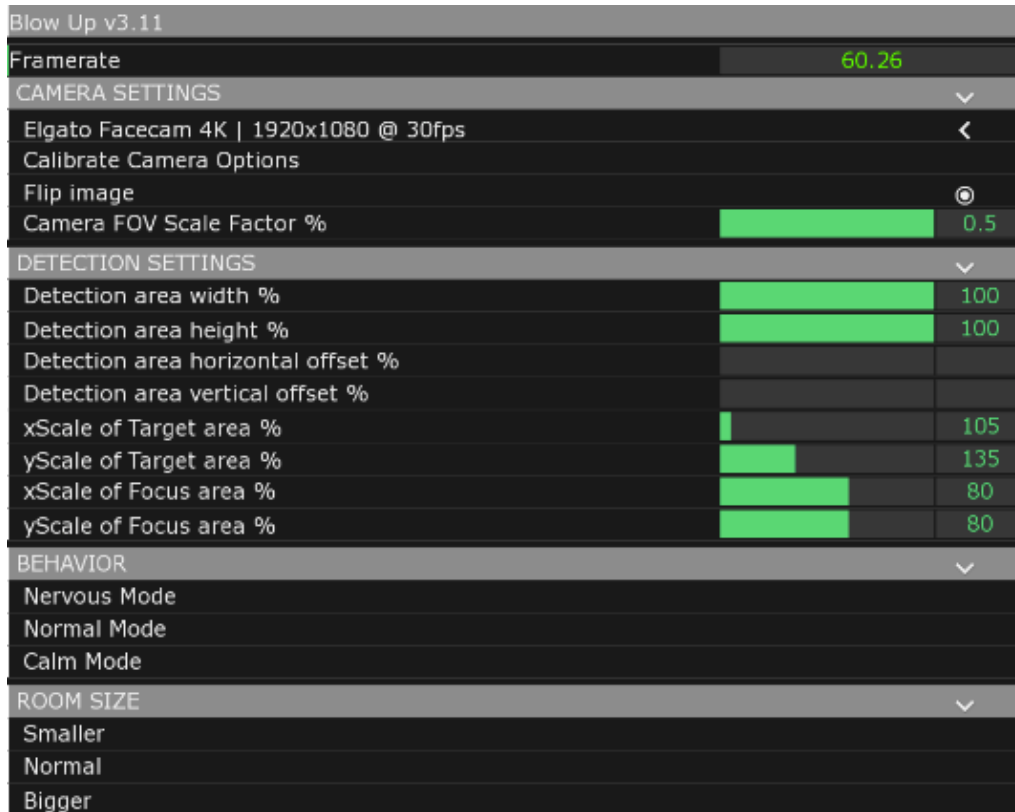
The software has a GUI function that can be accessed by pressing in the **u** key on the keyboard. Pressing the “Escape” key will quit the software.

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.

The displayed menu shows you settings and info in the left part of the display, and camera view next to it.



Blow Up - Main Settings

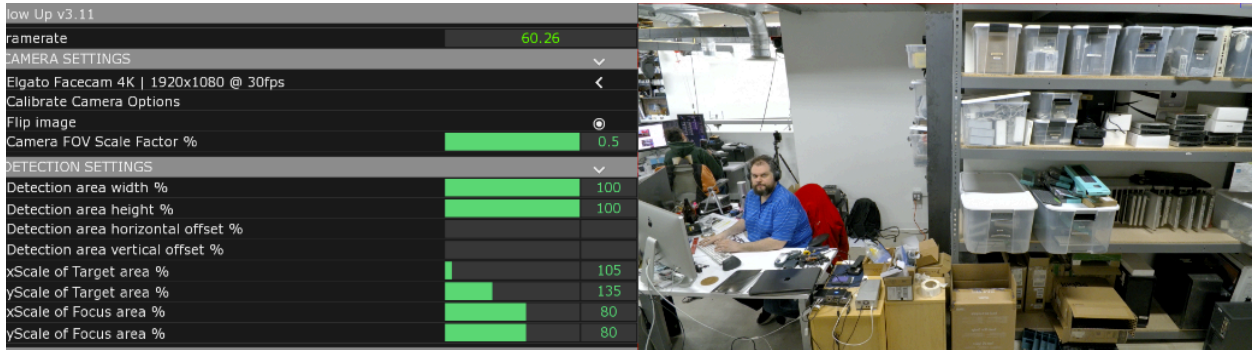


Settings	Description
Blow Up v9.99	Displays the software version running.
Framerate	Displays the overall frames per second rate of the software.
Behavior	<p>Three buttons are clickable and change the way the artwork reacts to people's presence. Normal Mode is usually preferred.</p> <ul style="list-style-type: none"> • Nervous Mode - reacts to small-amplitude movements. The detected target must be more active, and the virtual camera grid refreshes more frequently. • Normal Mode - reacts to typical-amplitude movements. The detected target must be moderately active, and the virtual camera grid refreshes at a standard rate. • Calm Mode - reacts to large movements. The detected target can be less active, and the virtual camera grid refreshes least frequently.

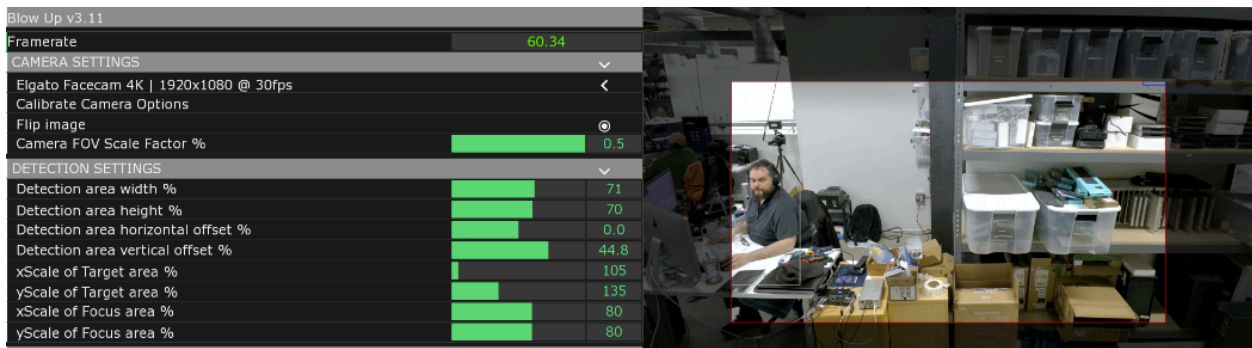
Settings	Description
Room size	Three buttons are clickable and adjust the yScale of Target area % based on room dimension: <ul style="list-style-type: none"><li data-bbox="662 348 914 380">• Smaller (Room)<li data-bbox="662 384 914 415">• Normal (Room)<li data-bbox="662 420 902 451">• Bigger (Room)

Camera Settings

The software allows some adjustments for the camera: selecting the camera device and mode to use, and the way it is rendered in software.



View of the menu, with a full sized detection area.



View of the menu, with a detection area using about 70% of the available camera resolution.

Settings	Description
Selected Camera	<p>This dropdown menu shows available camera devices and their supported modes (resolution / framerate). Any mode listed should be usable (when the list fits the camera model connected to the computer).</p> <p>Note:</p> <ul style="list-style-type: none"> Changes to camera settings require a brief initialization period.
Calibrate Camera Options	<p>Clicking this button will scan and test all available camera configurations and will populate the dropdown menu above. When connecting a new camera to the computer, this needs to be done: more explanation in next section.</p> <p>Notes:</p> <ul style="list-style-type: none"> The calibration process may take several minutes depending on the number of available cameras.

Settings	Description
	<ul style="list-style-type: none"> The application saves tested configurations for faster subsequent startups.
Flip Image	Toggle to horizontally flip the camera input.
Camera FOV Scale Factor%	This setting controls the size of the camera preview in the GUI.
Camera view	Shown at the right of the menu. When a detection area is set, part of the camera feed is darkened, enhancing the area where the system will attempt target detection.

Calibrate Camera Options

The camera calibration process automatically tests all available cameras and their supported configurations to determine the optimal settings and create a list of working configurations.

The process tests each camera against predefined resolutions: 3840x2160 @ 60fps & 30fps, 1920x1080 @ 60fps & 30fps, 1280x720 @ 60fps & 30fps. This is done in order to dismiss the configurations that would drop too many frames for the tracking engine.

The system attempts to set up the camera with target frame rate, then measures actual achieved frame rate within software needs and considers a frame rate valid if it achieves 90% of target rate. The configurations that fail the test are discarded and not shown in the options.

You only need to run the calibration process when:


- After connecting a new camera to the system.
- If experiencing performance issues.
- If camera behavior seems inconsistent.

How to calibrate for new cameras? First, click the "Calibrate Camera Options" button in the menu. Then, during the process - which may take several minutes- the software will:

- The screen shows a "Calibrating" message.
- The system tests all available configurations.
- The current configurations are saved after testing.

Detection Settings

The following detection settings adjust where the system will attempt target detection and how the virtual cameras will spread around the target while tracking it.

DETECTION SETTINGS		
Detection area width %		100
Detection area height %		100
Detection area horizontal offset %		
Detection area vertical offset %		
xScale of Target area %		105
yScale of Target area %		135
xScale of Focus area %		80
yScale of Focus area %		80

Settings	Description
Detection area width %	Percentage of camera width used for detection. Reduce this value if you want to zoom into the camera's field of view. The target will have to be in that detection area. Value can range from 25 to 100%.
Detection area height %	Percentage of camera height used for detection. Reduce this value if you want to zoom into the camera's field of view. Value can range from 25 to 100% and we recommend using the same value as the width % setting, unless you want to correct some camera aspect distortion.
Detection area horizontal offset %	Horizontal positioning of the detection zone. Value could go from -100 to 100, negative values moving the zone towards the left, positive values towards the right.
Detection area vertical offset %	Vertical positioning of the detection zone. Value could go from -100 to 100, negative values moving the zone towards the top, positive values towards the bottom.
xScale of Target area %	<p>The tracking box is marking the outer edges of the detected target (white frame in the camera view when following a target).</p> <p>This setting controls the horizontal scaling of the tracking box - how much we inflate it. Value can range from 100 to 200% and typically is set to about 105.</p>

Settings	Description
yScale of Target area %	This controls the vertical scaling of the tracking box explained above. Value can range from 100 to 200%. For the aesthetic of the artwork, this value is set around 135 to render more of the space above and under a target within the virtual camera views. A bigger room would require a smaller yScale, while a smaller room would require a bigger value.
xScale of Focus area %	<p>The outer boundaries of the focus area are defined by the yellow frame visible in the camera view during target tracking. The software ensures that, when virtual cameras are zoomed in on the target, each view contains at least one pixel within this focus area.</p> <p>This setting controls the horizontal scaling of the focus area box - how much we constrict it within the target. Value can range from 50 to 100% and typically is set to about 80.</p>
yScale of Focus area %	This controls the vertical scaling of the focus area explained above. Value can range from 50 to 100% and typically is set to about 80.

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 computers' power 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 software loads, but the camera is blacked out.

Is the camera properly connected to the computer? If not, ensure it is securely plugged in.

If the camera is connected but not detected by the artwork software, verify it using another application (e.g., QuickTime → New Movie Recording). Confirm that the camera is recognized by the computer and that its video feed is visible in that application. If it appears there, it should also be available in the artwork software (see next step). If it does not, the camera may be improperly connected or not recognized by the operating system, or malfunctioning.

Have you switched to a different USB camera, or is your camera listed in the Camera settings panel? If so, run the camera calibration to detect and configure the available camera options that meet the software's performance requirements.

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.

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

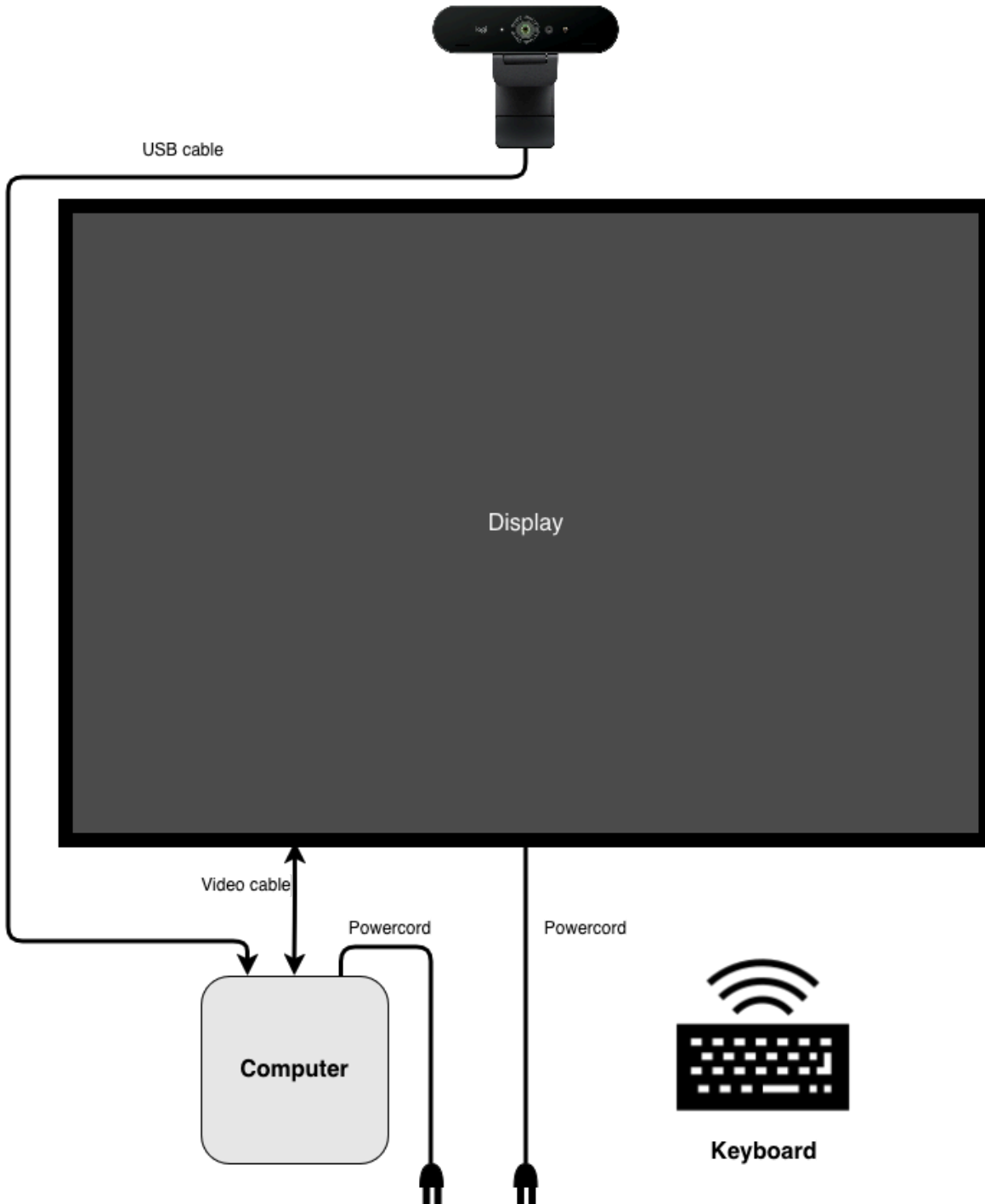
Description of Components

This artwork requires the following components:

Component	Description
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 M4 running at least on OSX 26.3.1).
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	<p>Anchors the display to the wall, levelled.</p> <p>The bracket should not have any tilt option (unless it is a more expensive unit able to lock the display position).</p> <p>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.</p>
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 Elgato Facecam Pro, the YOLOliv YoloCam S3 and the Logitech Brio 4K devices have been used with the software and approved by the artist.

Future software versions—or changes in market availability—may require a different camera. The following minimum specifications should be met or exceeded to ensure a smooth migration process. Note that future versions may also support alternative camera types (e.g., NDI or network-based devices).



Specification	Details
Resolution	3840 x 2160 @ 30Hz. In software, you would typically reduce the resolution to 1920x1080 or 1280x720; 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.