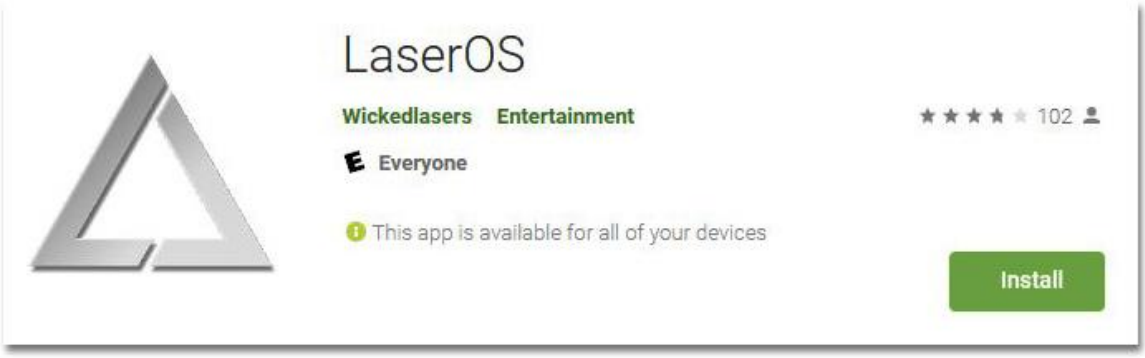
Installing LaserOS

In order to operate your LaserCube, you will need to download LaserOS.

- **Download for Android**
    - Follow this link to download from the Google Play Store.



    - It is recommended that, to keep LaserOS up to date, you enable *auto-update apps* in your Google Play Store app settings.

- **Download & Install for Windows PC**
    - Follow this link to download for PCs running Windows.
    - Double click on the downloaded .exe file to install LaserOS.
    - Occasionally, Windows will display the following warning. Click on “more info” to enable the “run anyway option”. Click on “run anyway”.

- **Download & Install for Mac**
    - Use the following link to download and install for Mac OS.
    - Double-click on the .pkg file and run the installer app.

- **LaserOS is currently not available for iPhones.**

- **Software Updates**
    - Each time you start the Windows or Mac LaserOS software, it will perform a check to see if there is a version update available. It is recommended that you keep the version up-to-date in order to enable the latest features and improvements.

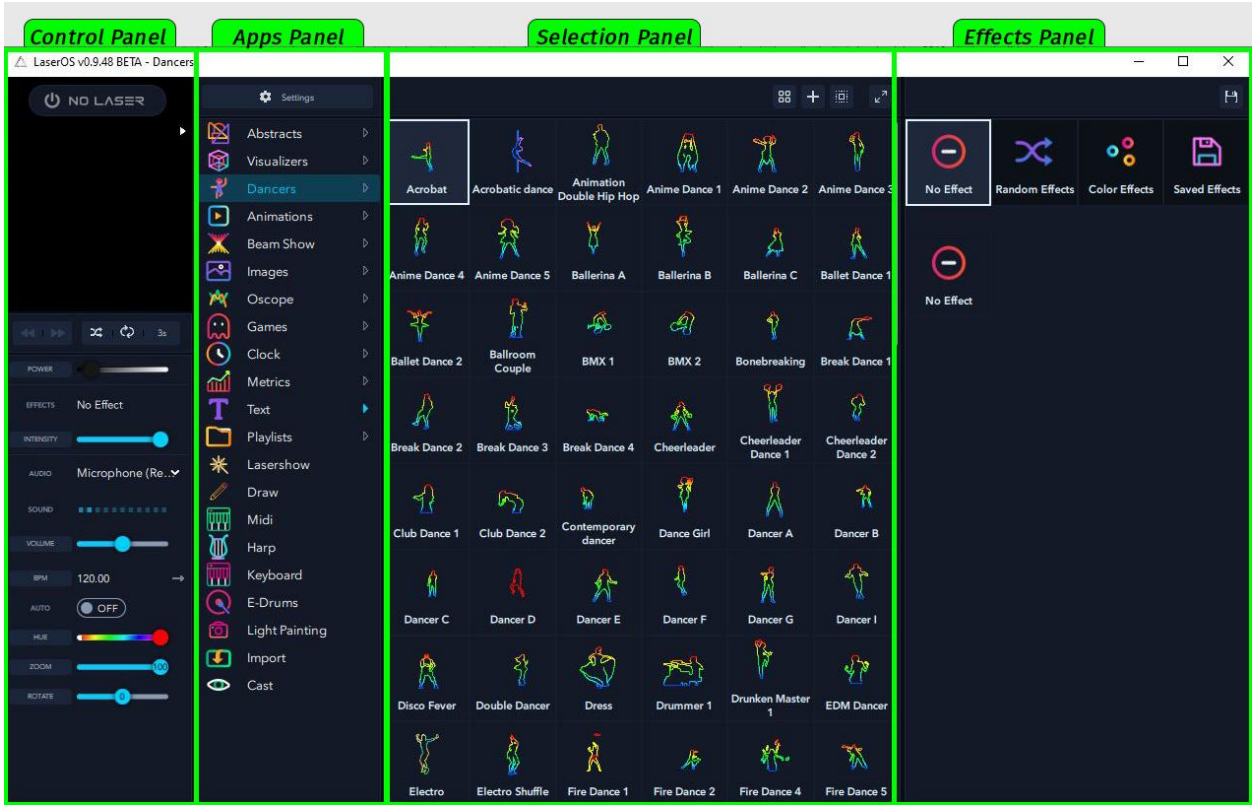
Using LaserOS

Enabling Network LaserCube

Pending product launch, the network capability is not visible immediately after LaserOS install.
To activate network capability, go to Settings, General and select Debug.
Selecting Debug will open a text box. In the text box, type testwifi, then OK.
A new button “Network” will appear at the top of the Settings, General page.
With the network switch off, LaserOS uses USB mode and cannot detect network cubes.
With the network switch on, LaserOS uses network and cannot detect USB cubes.

Having enabled Network in LaserOS, and connected to the LaserCube over WiFi or LAN - see connection modes, the grey No Laser status indication will become Laser OFF.
Clicking Laser OFF will enable the Laser output and the text will change to Laser ON.Once your LaserCube is set up and connected, power it on with the power switch. Depending on your setup, your control device (Windows, Mac, or Android) may auto-detect the LaserCube and start LaserOS automatically. If LaserOS does not start automatically, start it by double clicking on the app icon (Windows or Mac) or taping on the app icon (Android).

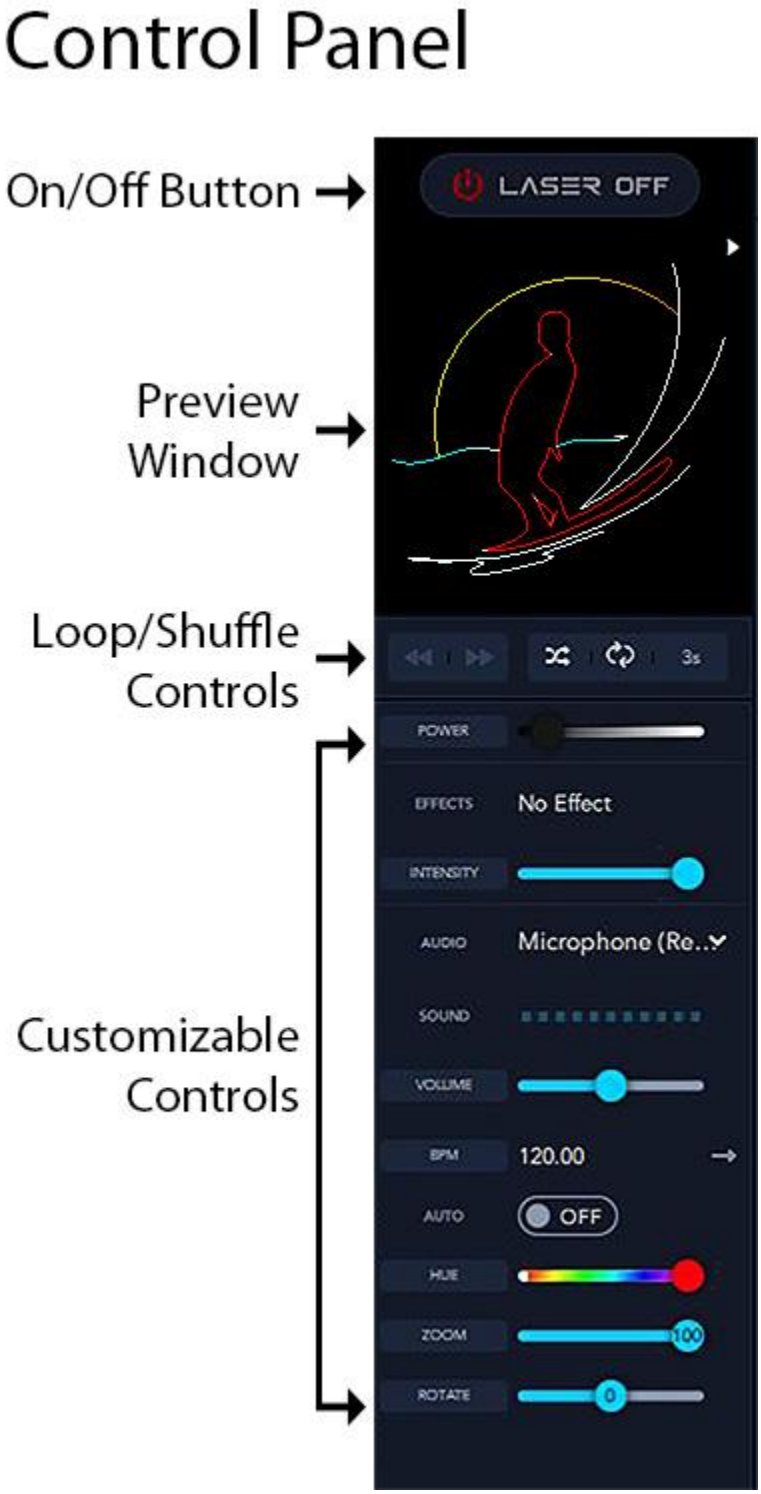
User Interface - Windows or Mac



The LaserOS interface consists of 4 main panels: The Control Panel, the Apps Panel, the Selection Panel, and the Effects Panel.

Control Panel

The Control Panel contains the laser status, preview panel, and a customizable set of control sliders, switches, and buttons.

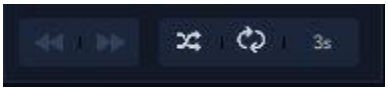


Clicking on a button in the control panel pops up options for the selected control. Dragging a slider decreases or increases the value of a control, and right-clicking on a slider allows you to enter a numeric value for finer precision.

Standard features of the control panel include laser power, level, effects selection, intensity, volume, hue, zoom level, and rotation. There are several advanced features as well:

Autoplay Feature

The Autoplay feature creates an easy-to-use, fully customizable laser show with minimal setup time. You can shuffle and cycle (loop) between apps, selections, and effects, or create your own playlist to select from.



Autoplay controls are located in the control panel, just below the preview window. The buttons include previous, next, shuffle, repeat, and cycle time. To use autoplay, add items from the Apps Panel, the Selection Panel, and the Effects Panel.

In the Apps panel, the small, blue arrow next to an app indicates that it is included in your auto play selection. Clicking on the arrow toggles the inclusion.

In the Selection Panel, double-click on an item to include it in your Autoplay laser show. Double-clicking toggles between de-selected (greyed out) or selected.

In the Effects Panel, select between “no effects,” “random effects”, “color effects”, or “saved effects”, and double-click on individual effects to de-select (grey out) or select an effect.

Back on the control panel, clicking on shuffle toggles between blue (selected) or grey (de-selected) to shuffle your selected apps, items, and effects. You can also use the repeat button to continuously repeat a custom playlist of laser projections. Lastly, the numeric value sets the amount of time in seconds that each item is displayed.

BPM Feature

The Beats-Per-Minute feature allows you to synchronize your laser show to your music. It can be set automatically by detecting the beats of your music, or manually by entering the beats per minute. This can be done by entering a numerical value in the BPM pop-up window (accessed by clicking on the BPM button in the control panel) or by “tapping” the desired beat rate by clicking on “tap” at each beat until the desired timing is set.

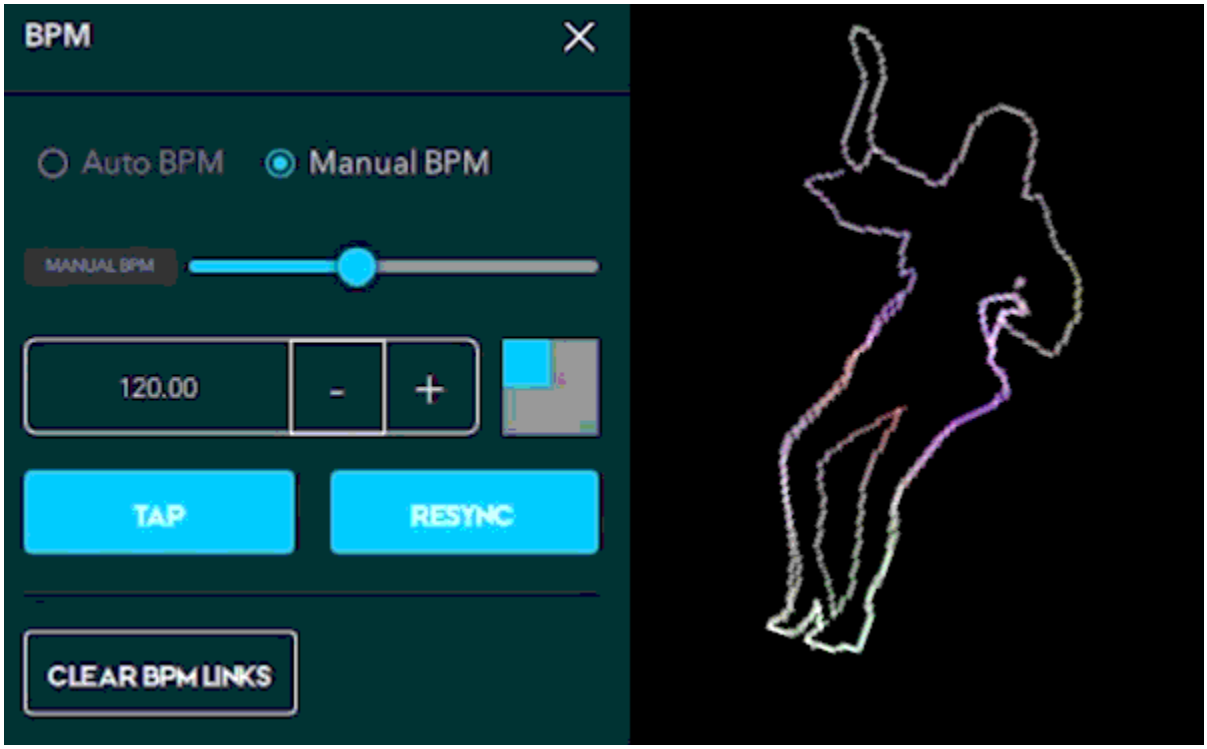
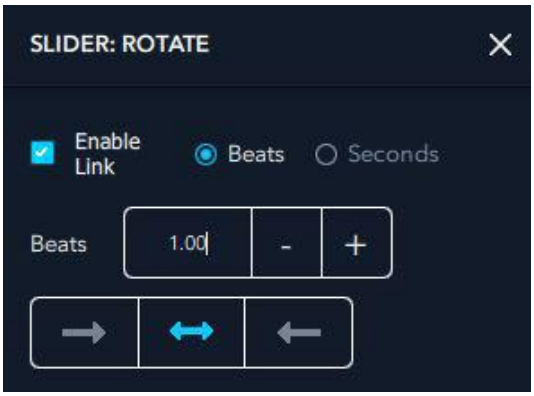


Illustration of BPM feature when used with rotation control.

The BPM feature is enabled by clicking on the button next to the desired slider in the control panel. A pop-up window will appear with BPM options. For example, clicking the button next to the *rotate* slider pops up the following window, in which BPM can be enabled:



Rotate Slider Pop-Up

You can control the number of reactions of your laser projection per beat, and whether it animates forwards, backwards, or oscillates between the two.

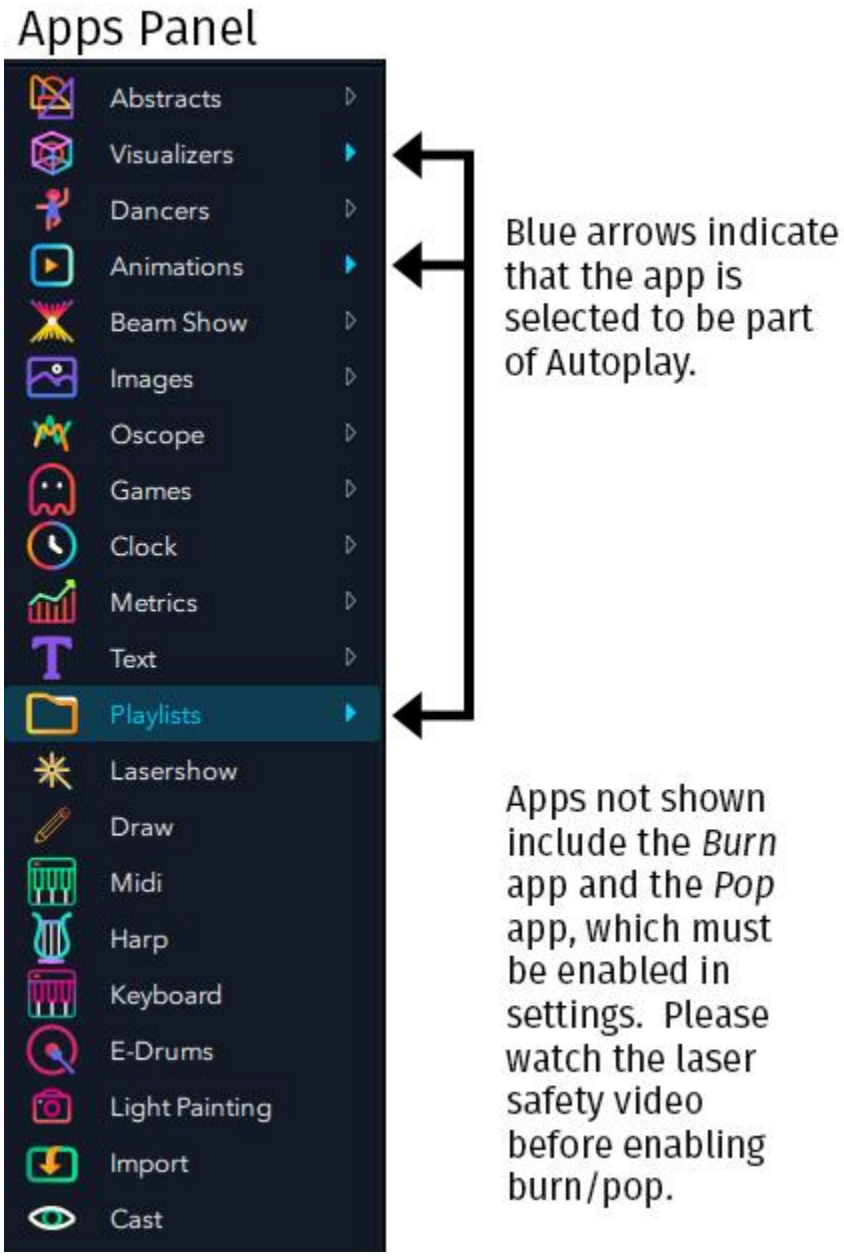
To reset or clear the controls linked to the BPM feature, click on the BPM button and select “clear BPM links” in the pop-up window.

Customizing the Control Panel

Sliders and controls from within other app settings may be added to the control panel on Windows or Mac versions of LaserOS. Holding the shift key, select and drag the desired app control to the control panel.

Apps Panel

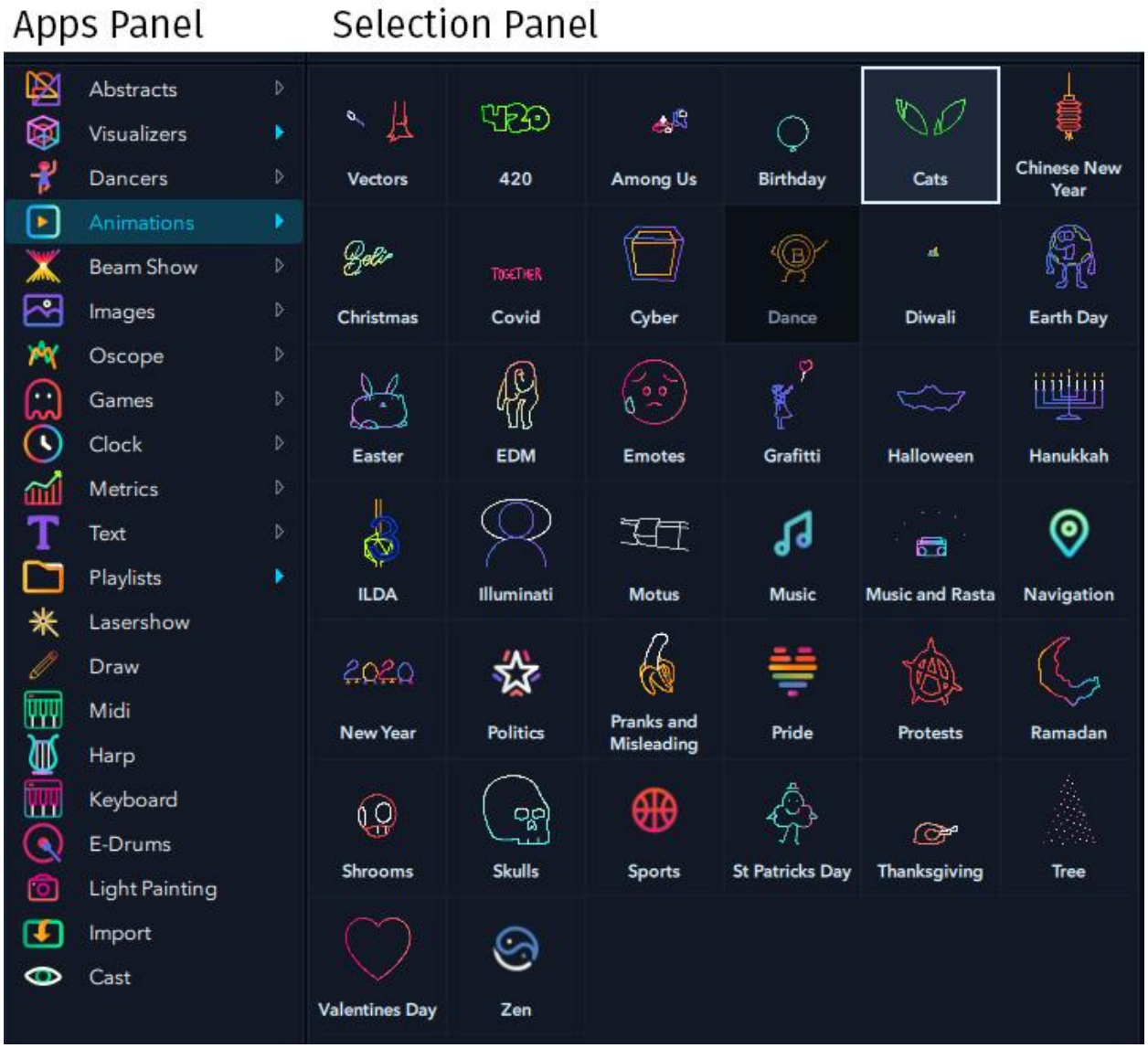
The Apps Panel contains the different apps included in LaserOS. Each app will be discussed in further detail in the individual apps section.



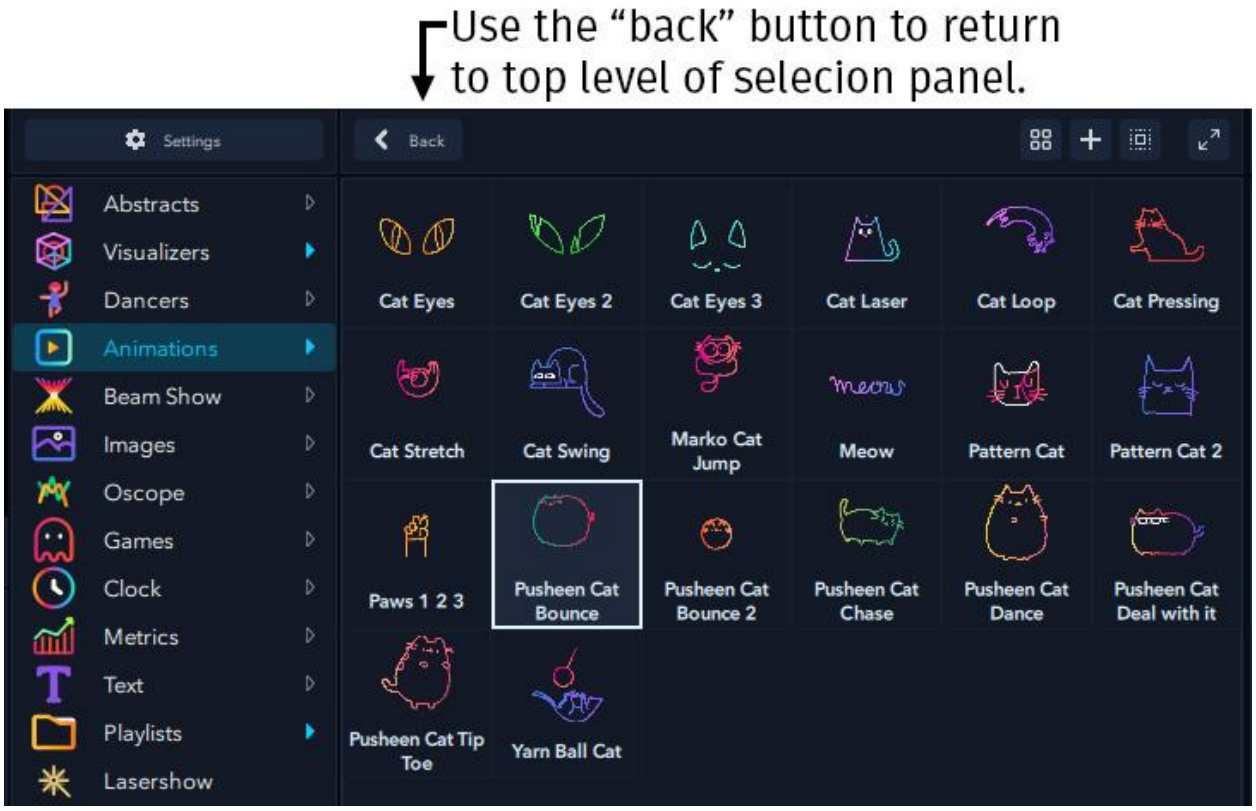
Selection Panel

When an app is selected in the Apps Panel, the selections relevant to that app are displayed in the selection panel. Selections may be controls, individual items such as animations, or groups of items.

For example, when the *Animations* app is selected in the Apps Panel, several groups of animations are shown in the Selection Panel. Selecting the *Cats* group then brings you down into the group of cat animations.



Cats group selected under the *Animations* app.



Cats sub-menu of Selection Panel.

The buttons at the top right of the selection panel are the Assign Hotkeys, Add to Playlist, Toggle All, and Hide Effects buttons:

Assign Hotkeys

Toggle the Assign Hotkeys button in order to automatically assign keys on your keyboard to each item in the selection panel. Key assignments are shown next to the icons.

Add to Playlist

Clicking on the + button adds the selected item to a playlist in the Playlist App.

Toggle All

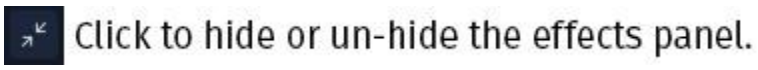
The Toggle All button toggles items between selected/deselected in the selections panel. This is useful for shuffle modes and autoplay.

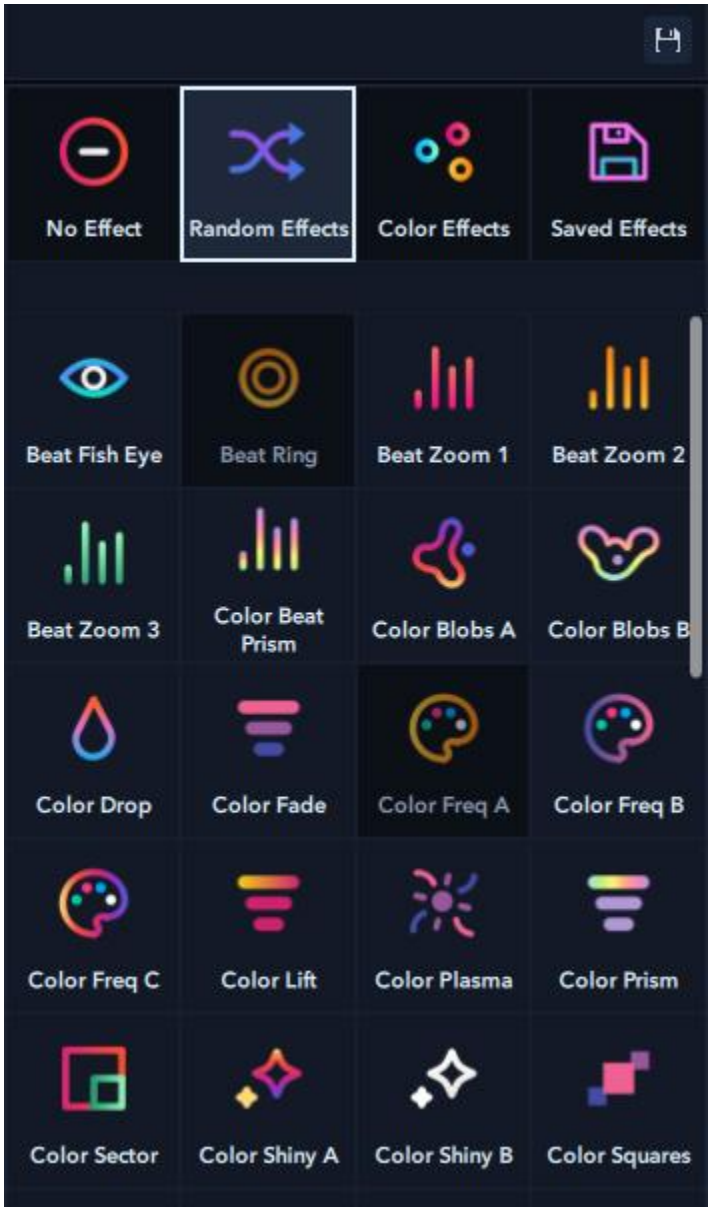
Hide Effects Panel

The Hide Effects Panel button hides or shows the effects panel when selected.

Effects Panel

The Effects Panel is the last panel on the right side of the Windows/Mac user interface. If you cannot see the effects panel, please click on the “expand window” button:

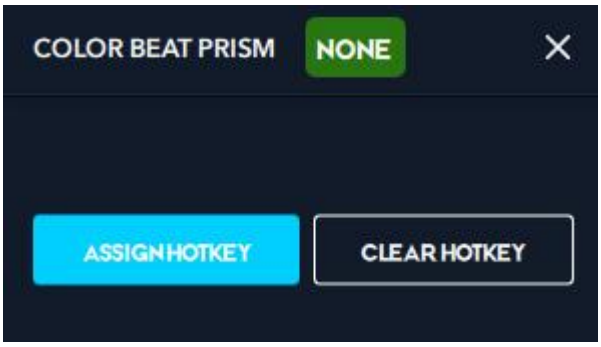




The *Effects Panel* allows you to turn off effects, select random effects, select color effects, or select effects from a saved list.

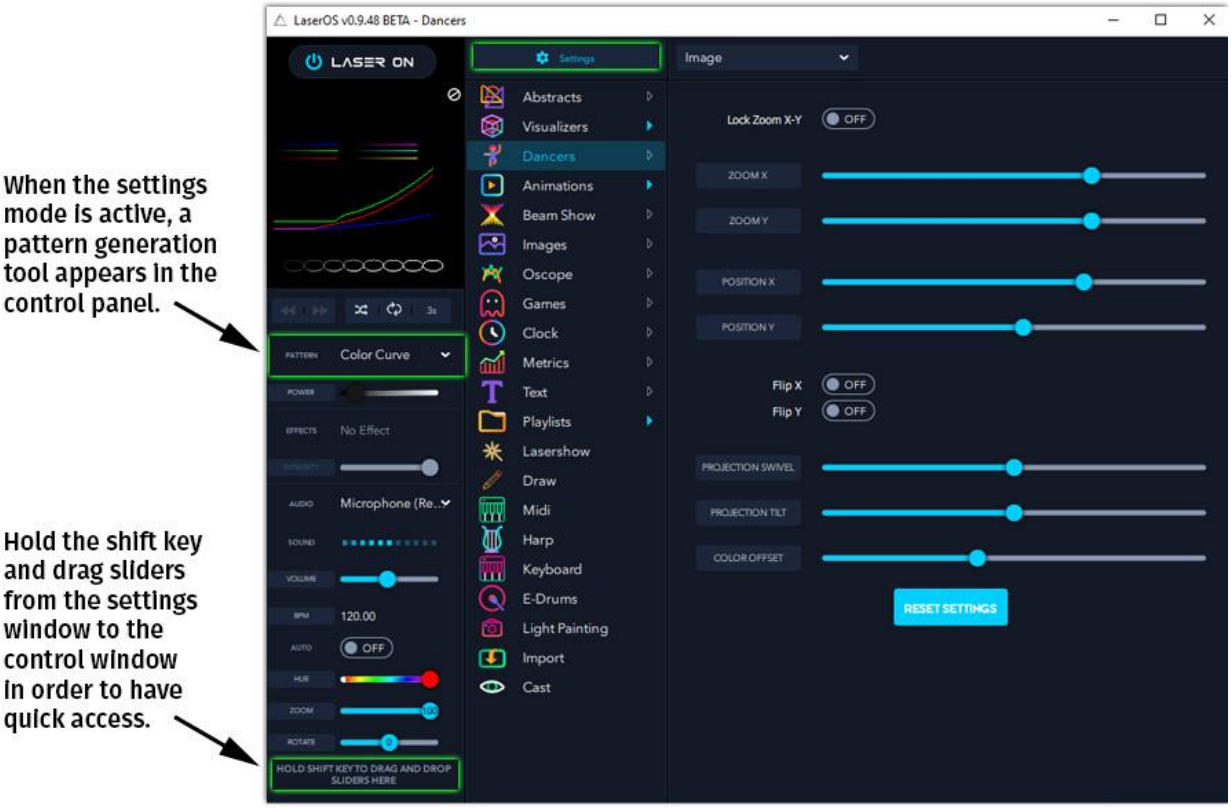
To toggle the on/off status of an effect (for use in Autoplay shuffle, for example), double-click on the effect to deselect (grey out) or select it.

You can also assign a hotkey on a keyboard or midi to toggle an affect. To assign a hotkey, right-click on the desired effect and select “Assign Hotkey” in the pop-up window. Type the key you wish to assign to the effect.



Settings Mode

Enter the settings menu by clicking on the settings button above the apps panel. This toggles the main interface into “settings” mode. To exit settings mode, click on the settings button again.

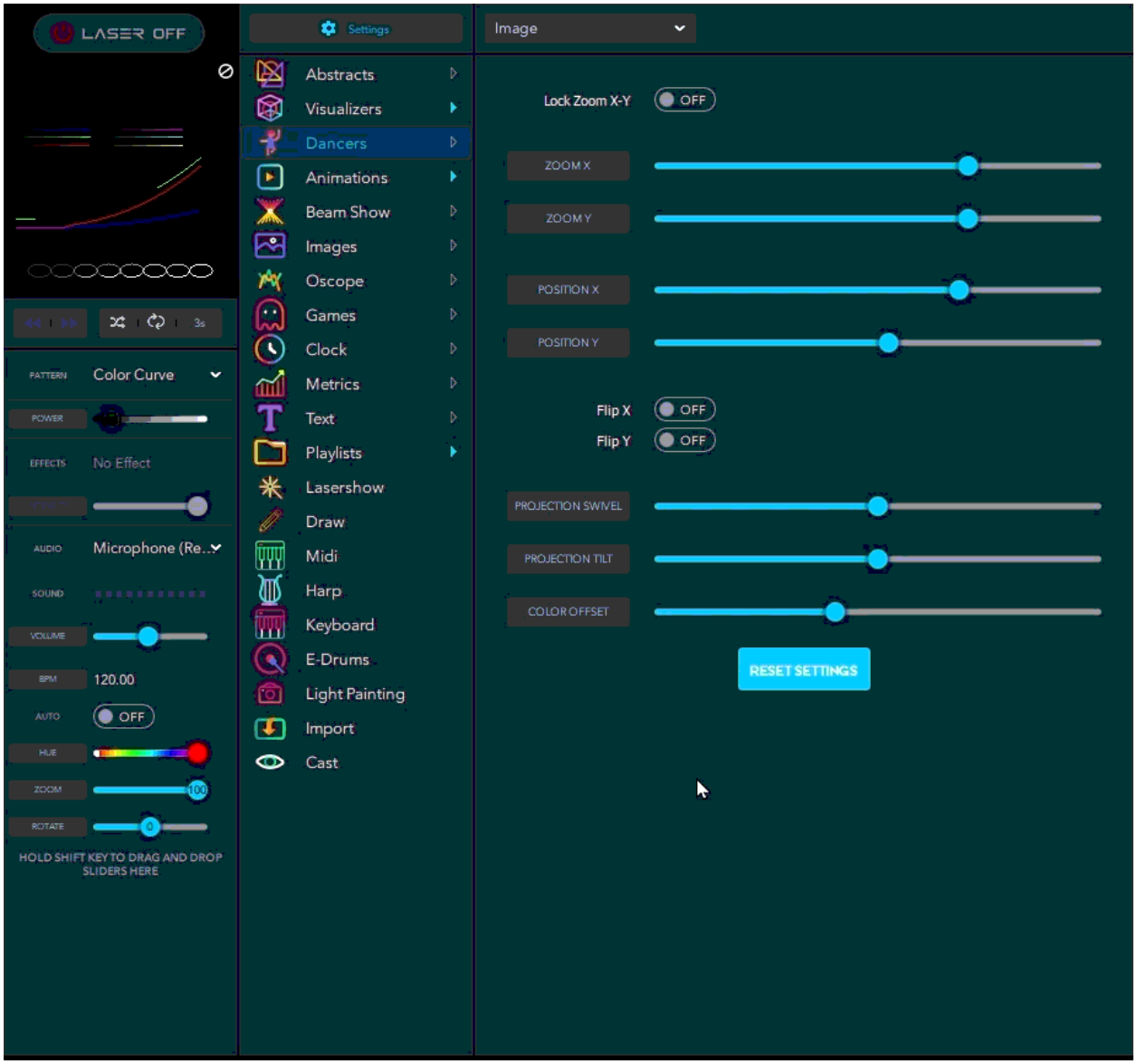


Test Patterns

While in settings mode, a pattern generation tool is added to the control panel. This enables you to display a variety of setup patterns to determine the size of your laser projections, color range, coverage, shape tests, and more.

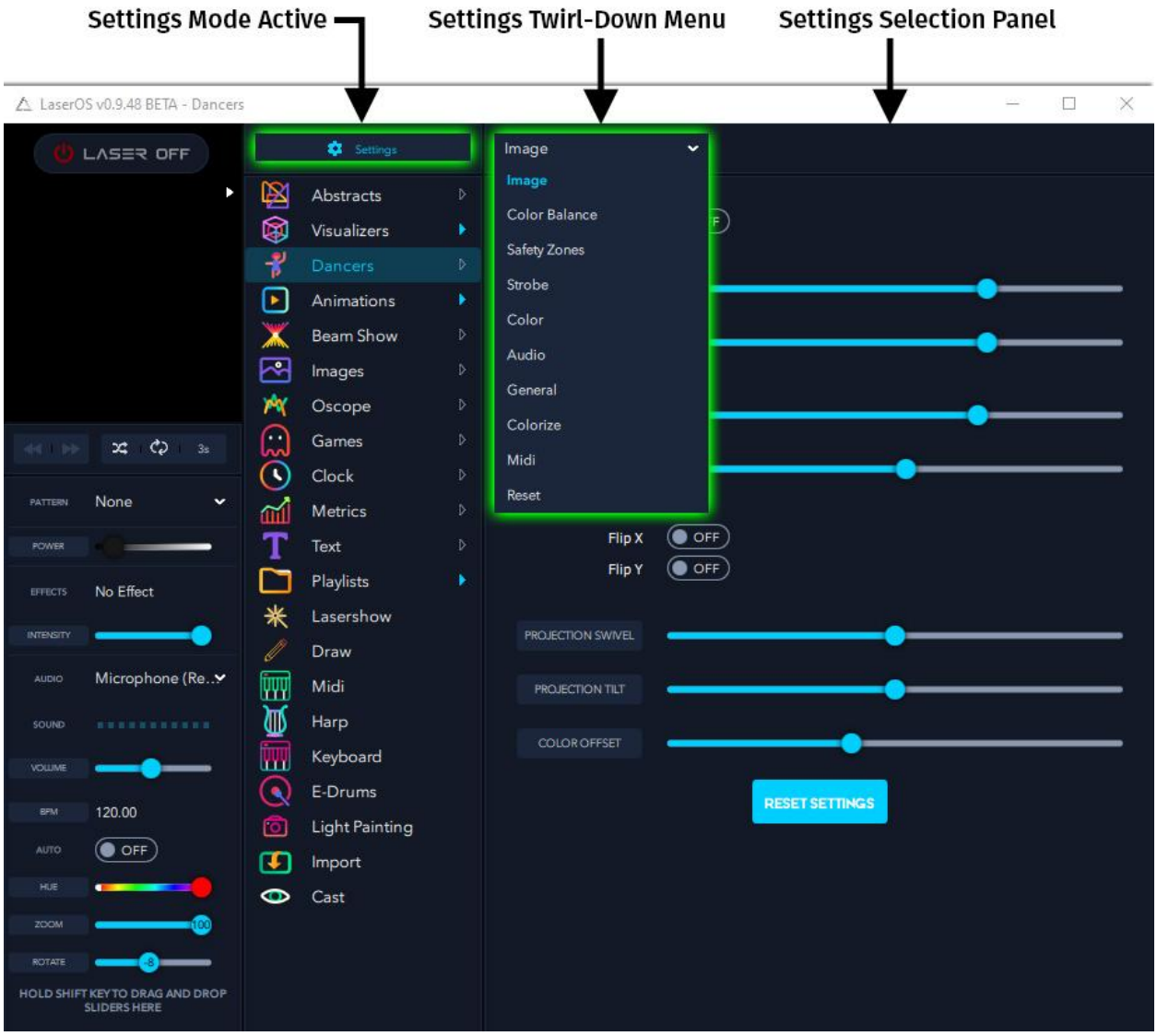
Customizing the Control Panel

Sliders can be added to or removed from the control panel to customize your setup. Holding the shift key, drag the desired slider to the control window. To remove it, hold the shift key and drag it to the trash icon which appears.



Settings Menu

When settings mode is activated, a twirl-down menu appears to the right of the settings button. The selection panel displays options for the current settings twirl-down selection.



In settings mode, the twirl-down menu displays options for Image, Color Balance, Safety Zones, Strobe, Color, Audio, General, Colorize, Midi, and Reset.

Image

The Image settings mode allows you to control the size (zoom) and position of your projections. You can also flip the image horizontally or vertically. Swivel and tilt options are available, as well as color offset.

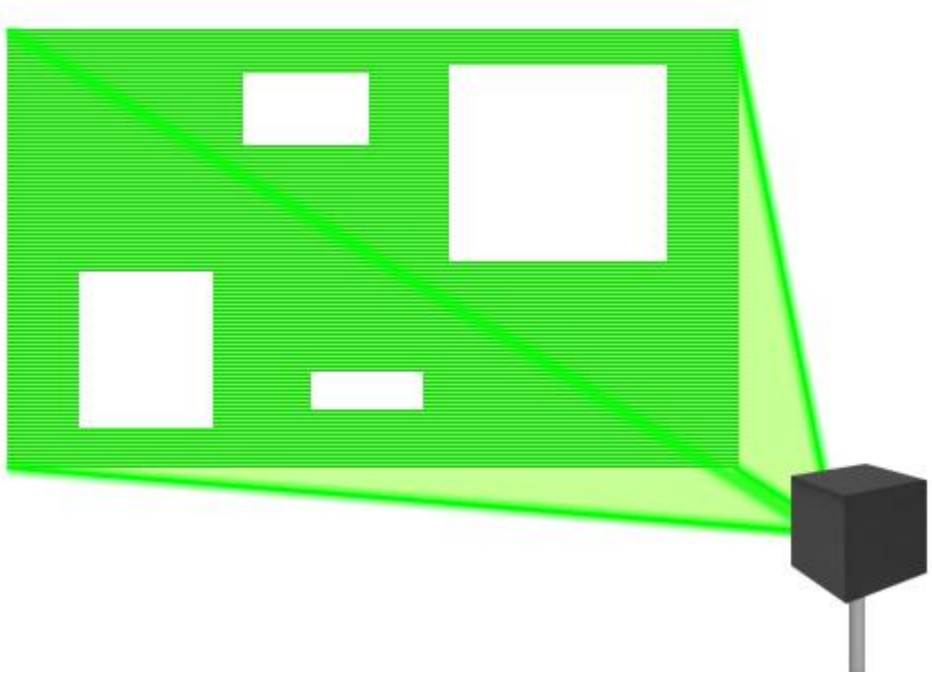
To reset settings to their original value, simple click on “reset settings”.

Color Balance

Color Balance settings mode allows you to control the color range via max and min RGB sliders. Gamma RGB sliders control gamma, and a TTL mode toggle switch constrains the colors to within a TTL projector range of colors.

Safety Zones

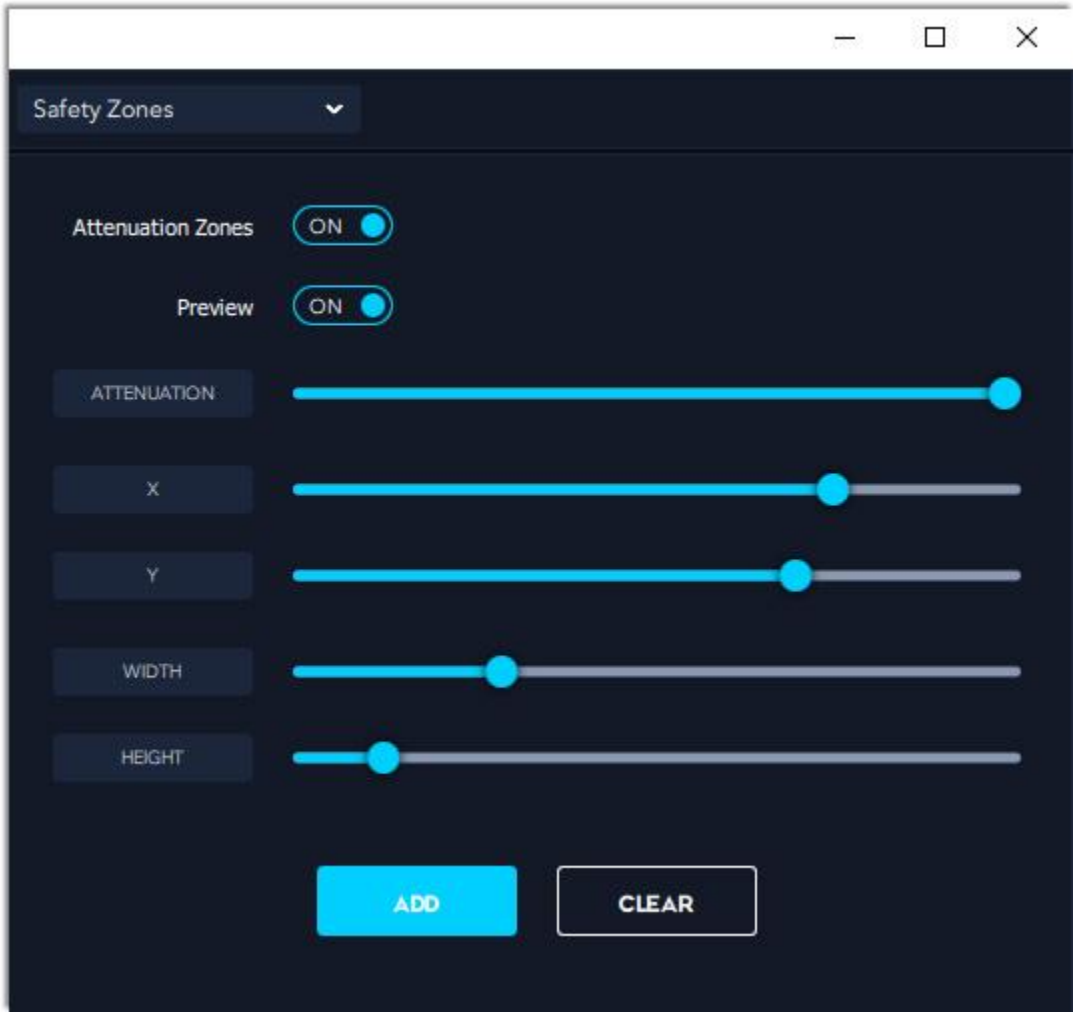
Safety Zones are an important feature of LaserOS. They allow you to designate zones *within* the projection area where the laser will not project.



Safety zones are “blank” areas in the projection where the laser projector will not scan. This is useful to protect sensitive equipment such as cameras, avoid reflections or other dangerous situations, and as an extra safety feature of LaserOS.

To set up safety zones, go into the safety zones settings menu and toggle the “Attenuation Zones” switch to “ON”.

Set the preview switch to “ON” to see a projection of the attenuation zones. You will also see them in the preview window of the control panel.



Attenuation is the amount the laser is blocked from scanning in the safety zone. An attenuation of 0 means full power scanning, and an attenuation of 100 means scanning is completely off inside the safety zones. Use the attenuation slider to control the level of attenuation.

Use the X and Y sliders to position the attenuation zone. Use the width and height sliders to set the size and shape of the attenuation zone.

To add more attenuation zones, click the “add” button. This will duplicate the attenuation zone you already have set, so you’ll need to adjust the position or scale in order to see the new attenuation zone.

Clicking the “CLEAR” button will remove all of your user-defined attenuation zones, and display the default, single, square attenuation zone.

When you are finished setting up your safety zones, toggle the preview switch to “OFF”. Now, laser projections will be blocked from scanning in the safety zones.

Strobe

Strobe allows you to set up a flashing laser strobe light style projection. Sliders control the amount of time the laser is on and off.

Color

Color settings mode lets you control the hue, saturation, and RGB fade of laser colors. There is also a switch to turn on VenumCube, which limits your laser projection color to bright, powerful green.

Audio

The audio settings mode is used to set a sound gate and sound detection level. This is useful when using audio-reactive effects and/or the BPM feature.

General

There is a variety of features in the general settings mode. Users can enable or disable options such as start-up animations, software update availability checks, tutorials, and more.

Links to laser safety videos and bug reports are also in the general settings pane

Colorize

The Colorize settings panel allows users to add or change color effects on laser projections. Toggle the “ON/OFF” switches to apply colorization to selected apps. In the effects panel, select or deselect the blue arrow in order to add or remove colorization effects during shuffle or playlist modes.

Midi

LaserOS and your LaserCube can be controlled from a Midi device. In this settings mode, set your midi input, select channels, and enable blinking of current midi (optional).

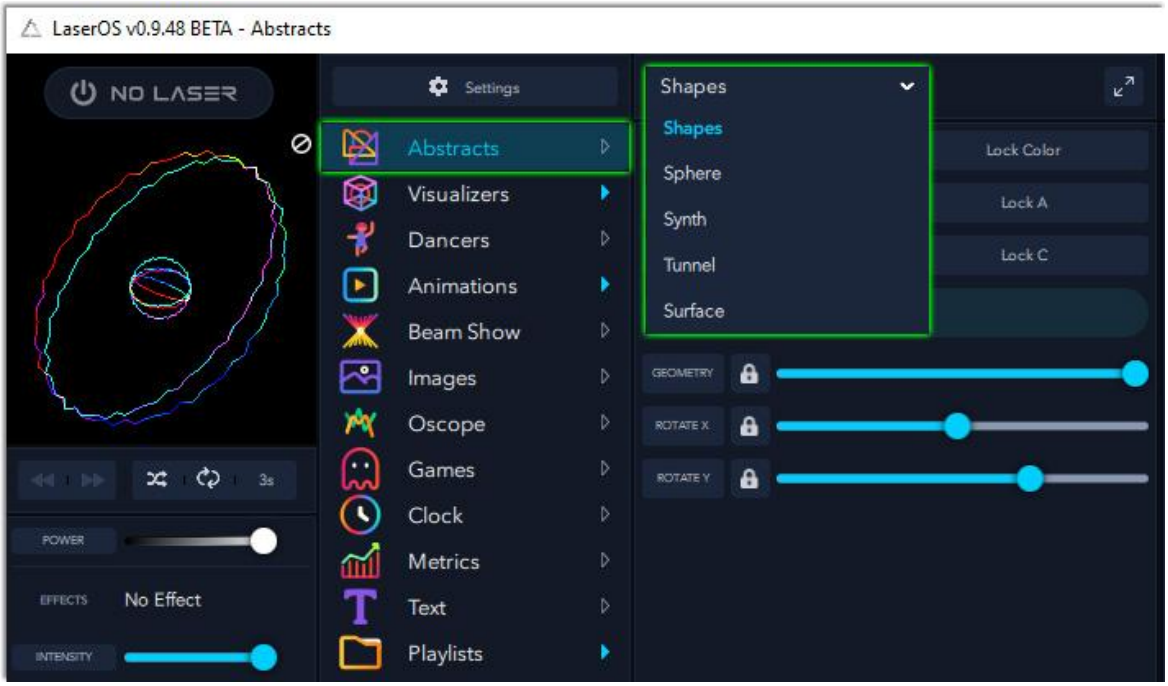
Reset

The reset settings mode enables you to reset your LaserOS settings to the default modes.

Apps

Abstracts

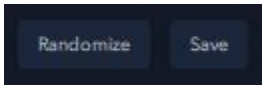
The Abstracts app contains 6 sets of abstract pattern generators: Shapes, Sphere, Synth, Tunnel, and Surface. These pattern generators are most interesting when used with audio, as the abstract patterns are audio-reactive.



There is an audio meter in the control panel which displays the volume of audio detected. If LaserOS is detecting music correctly, the sound meter reacts to the volume of audio detected. It is recommended to play audio while setting up abstracts.

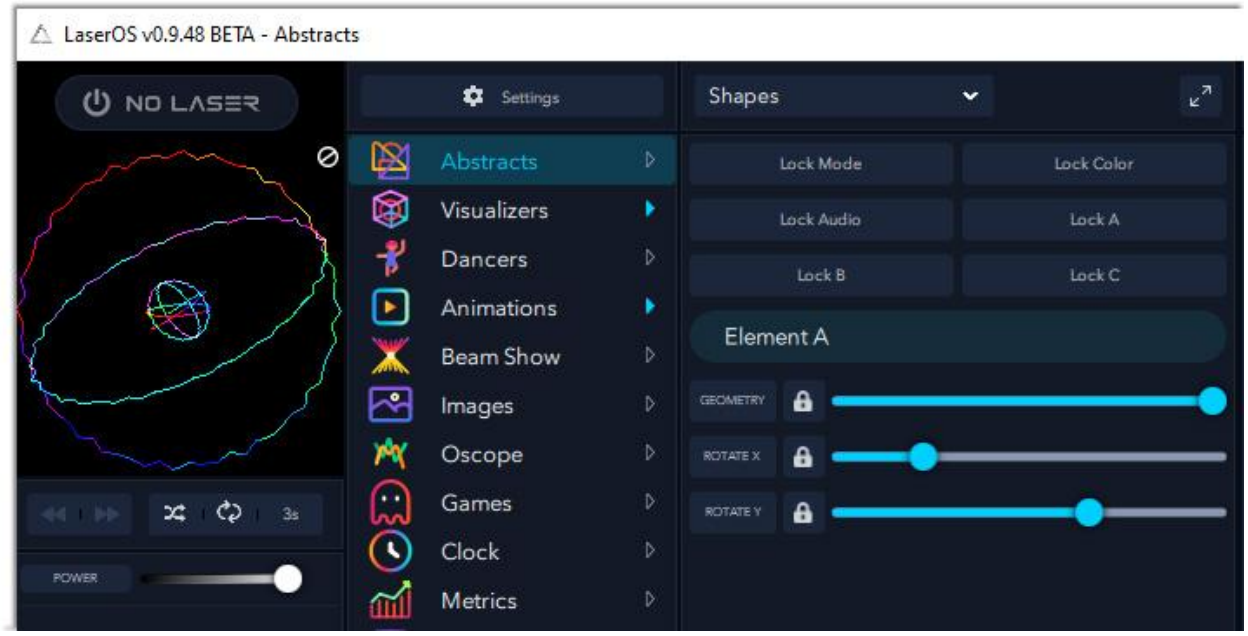
Selecting “Randomize” in any of the Abstracts windows will randomly generate an abstract pattern except for items that have been locked.

Clicking on “Save” in any of the Abstracts windows will save your pattern to a playlist called “Abstracts” in the Playlists app.



Shapes

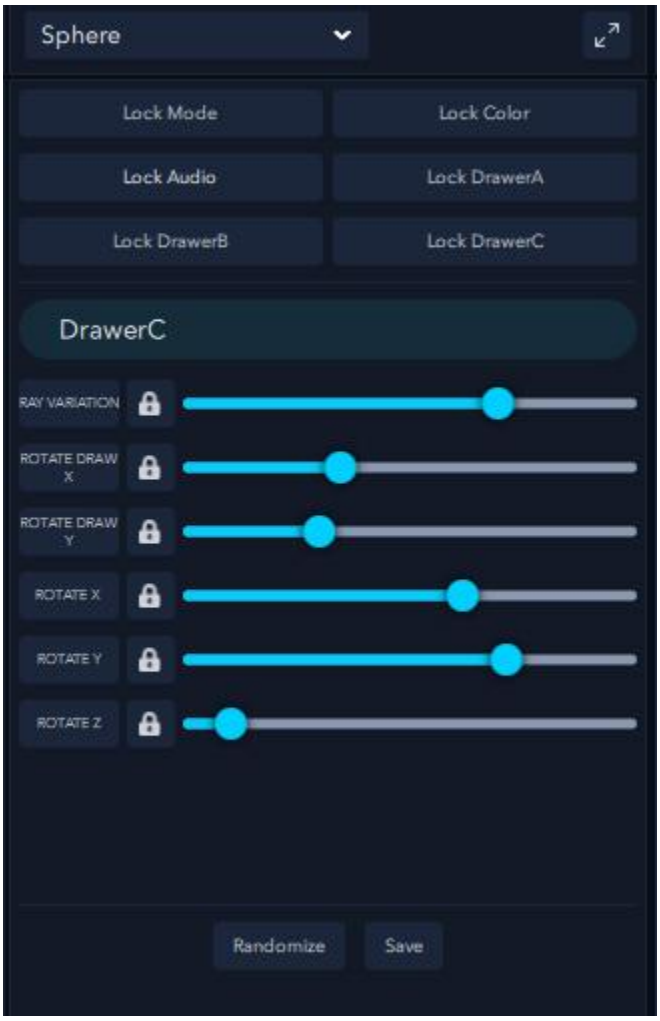
In the Abstracts → Shapes mode there are three audio-reactive elements. To correctly visualize all elements, make sure audio is set up correctly and playing.



In the Shapes menu, there are 3 elements (A, B, and C) with various options for geometry and rotation. In the image above, the preview shows two of the elements as rotating circles with audio distortion while the third element is the sphere in the center.

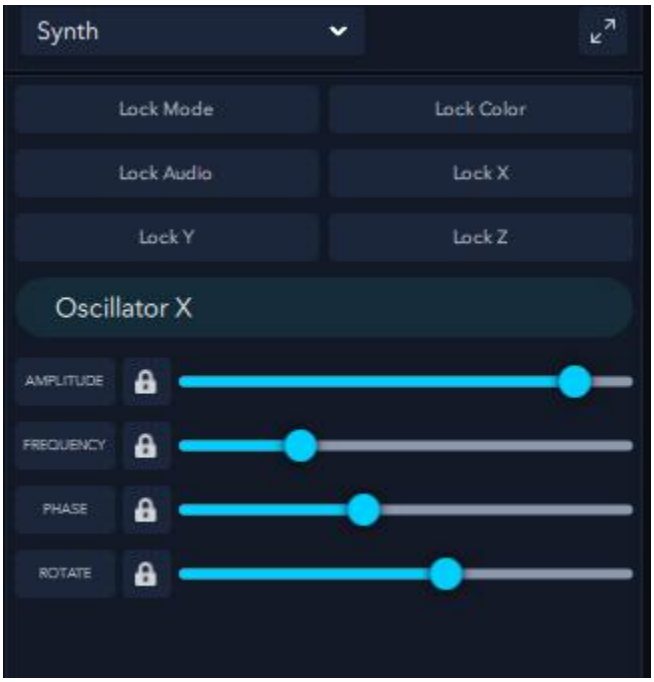
Sphere

The Abstracts → Sphere mode has three “Drawers” with sliders for ray variation and rotation in the X, Y, or Z plane.



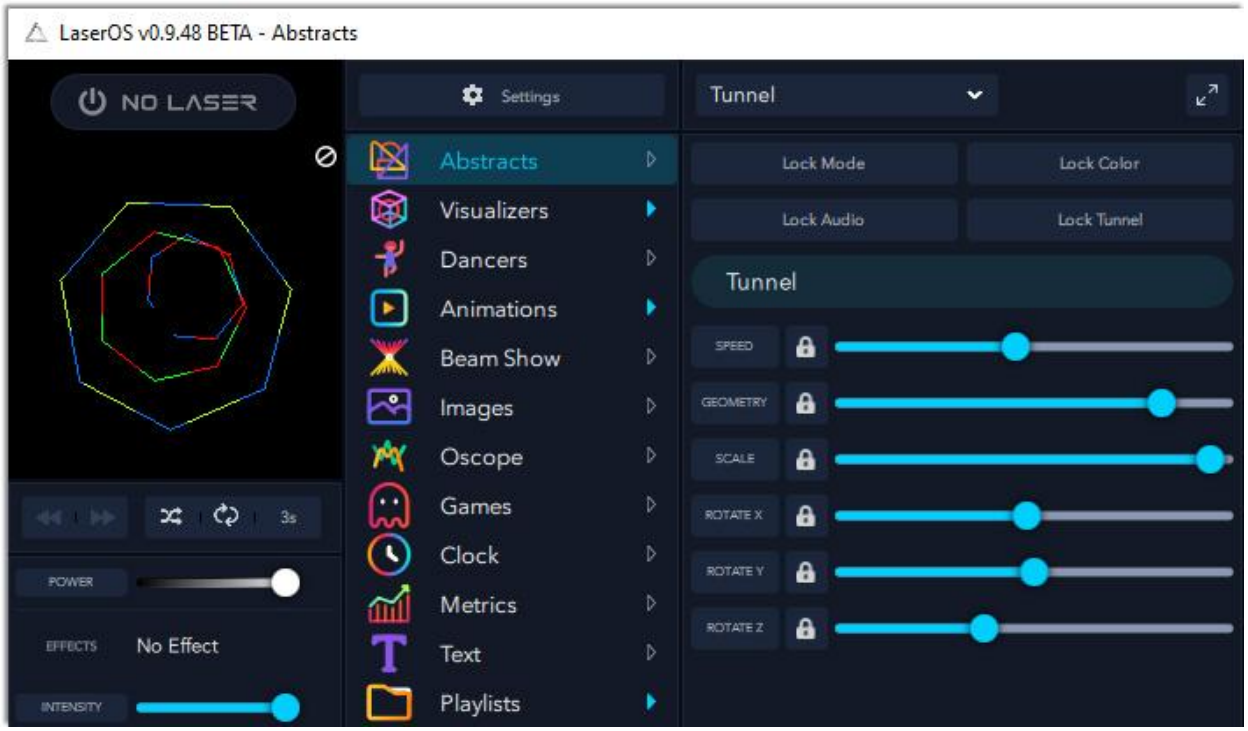
Synth

The Abstracts → Synth mode displays three oscillators with sliders for amplitude, frequency, phase, and rotation. Audio may be linked to any or all of the oscillators.



Tunnel

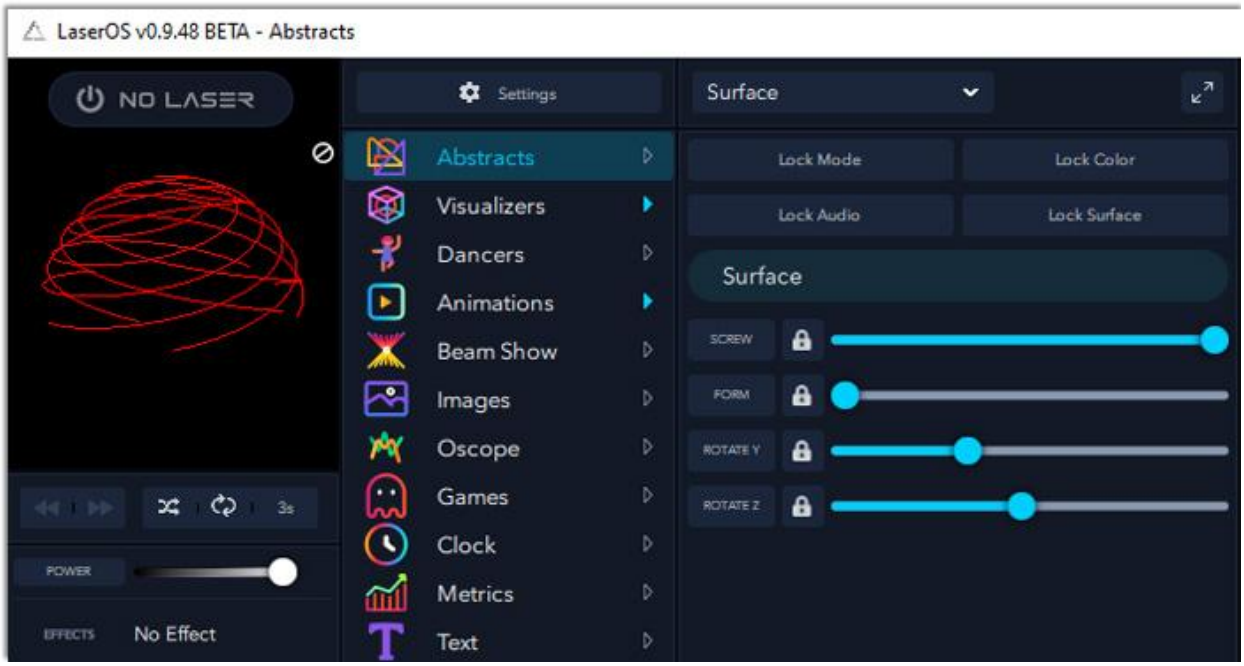
The Abstracts → Tunnel mode generates a pattern with the visual effect of traveling through a 3D tunnel.



Tunnel speed, geometry, scale, and rotation sliders are available. Colors and Audio reaction choices are linked from the Tunnel pull-down menu.

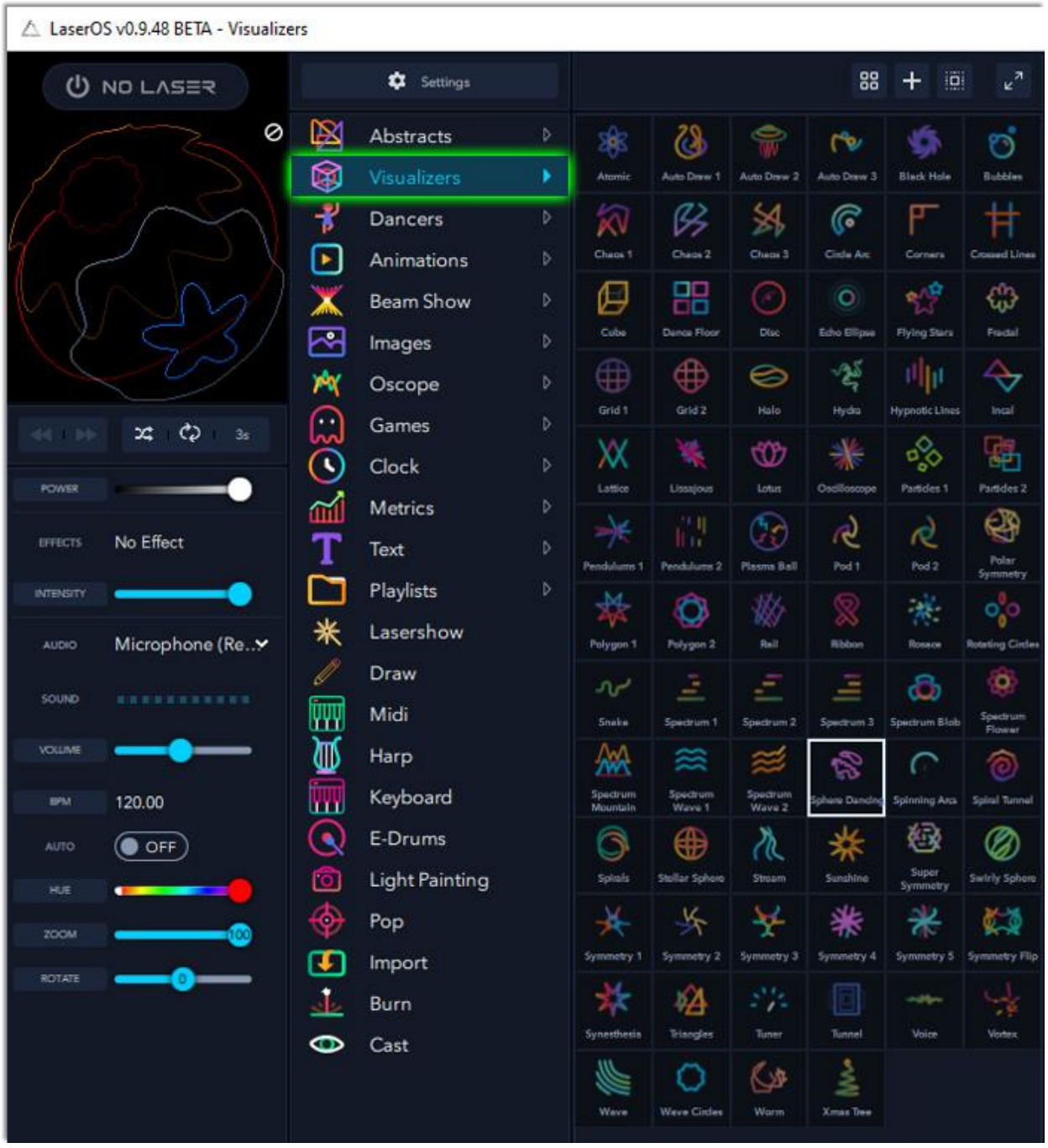
Surface

The Abstracts → Surface mode creates an abstract projection of a surface, with various screw, form, and rotation settings.



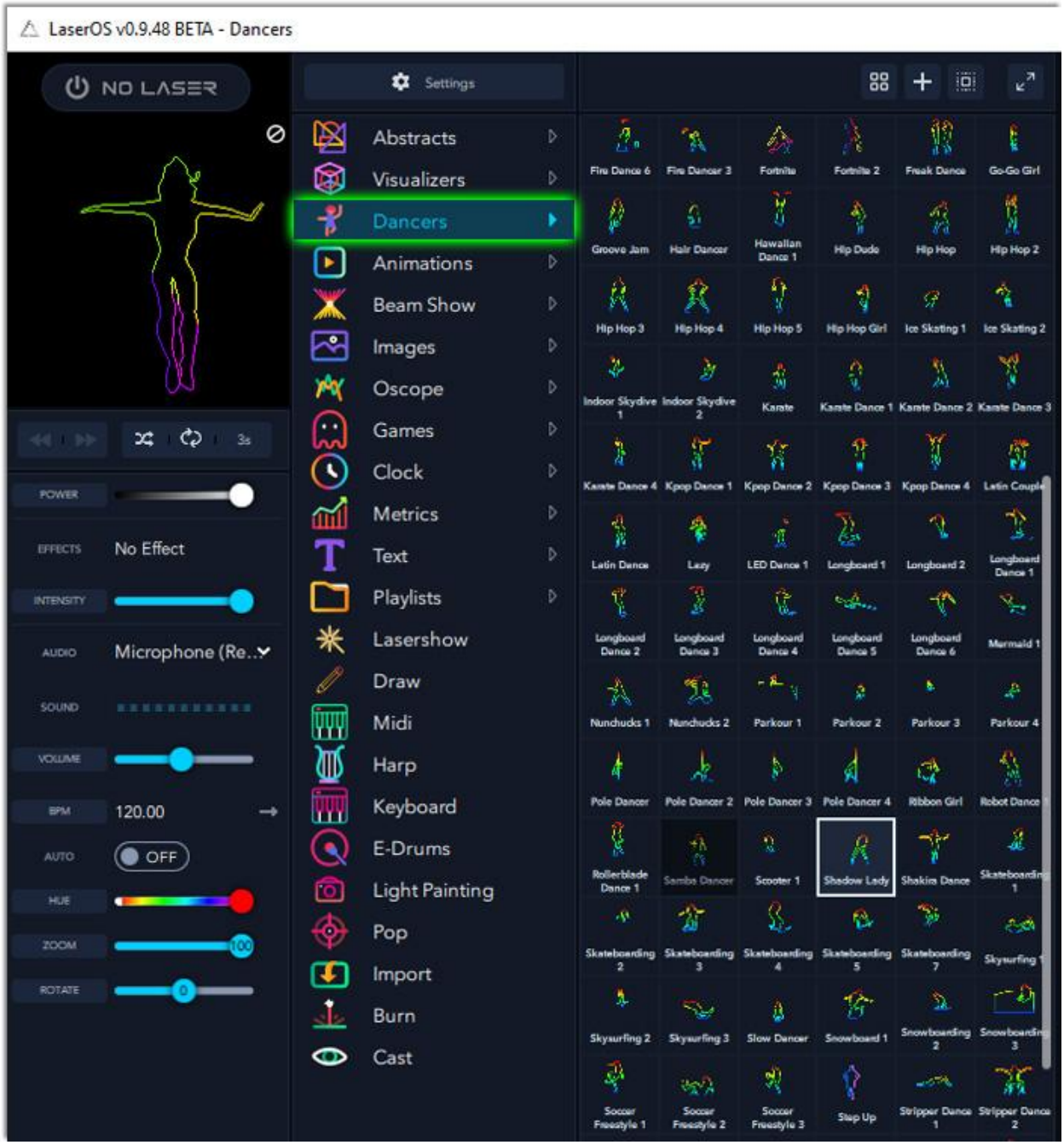
Visualizers

The Visualizers app contains a large assortment of pre-defined animations. They may be played alone, or selected/deselected by double-clicking in order to make them available during random shuffle or autoplay.



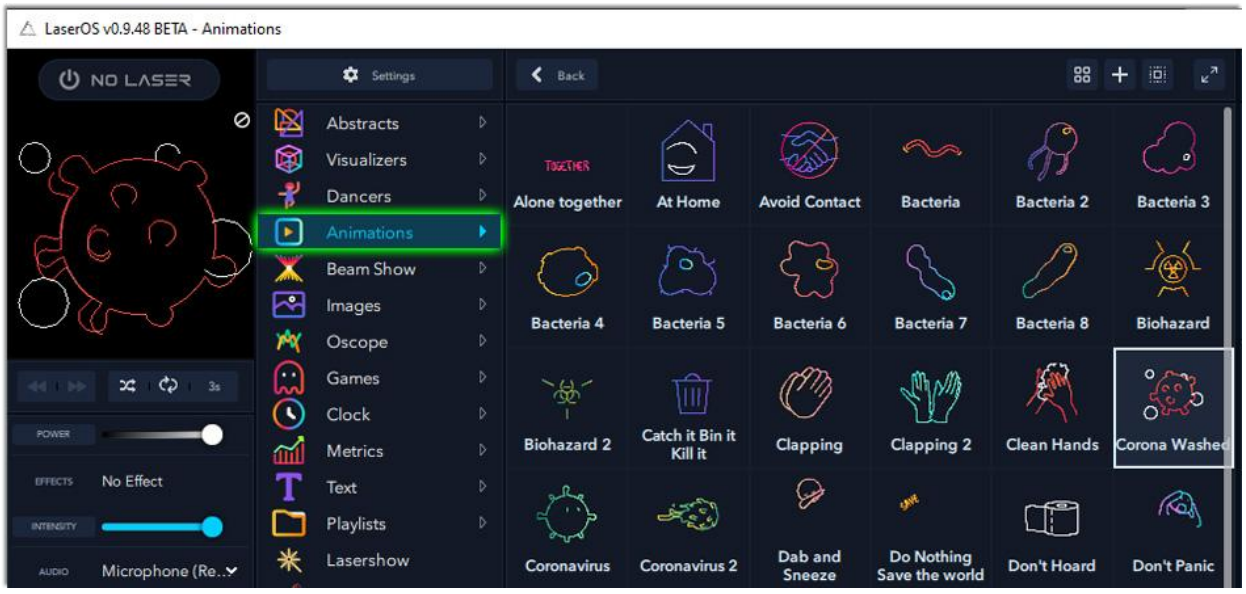
Dancers

The Dancers app contains an extensive list of animated dancers, BMX riders, surfers, skaters, and more. Play them individually or select/deselect by double-clicking to include or exclude them from random play, shuffle, auto play, or playlists.



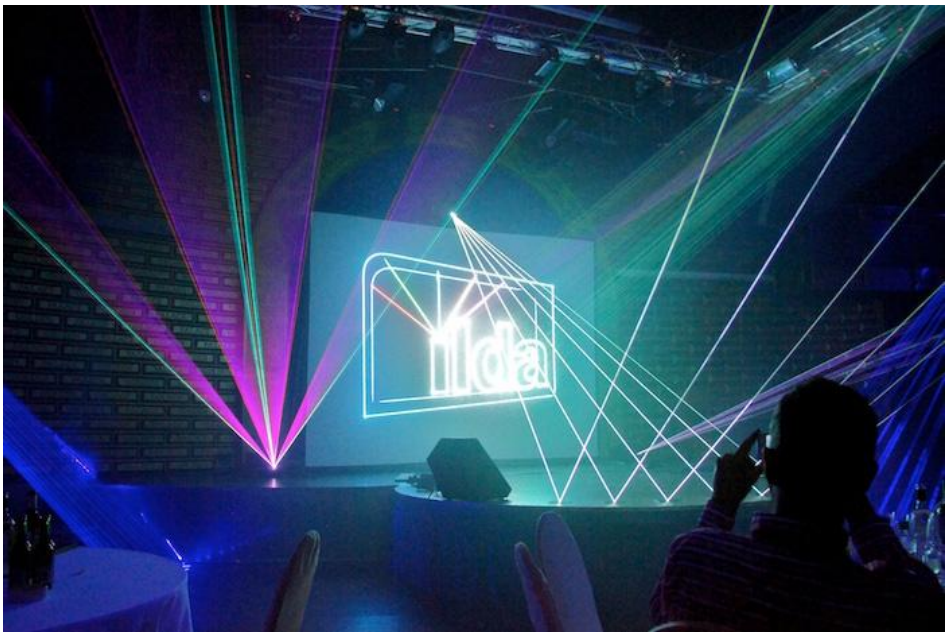
Animations

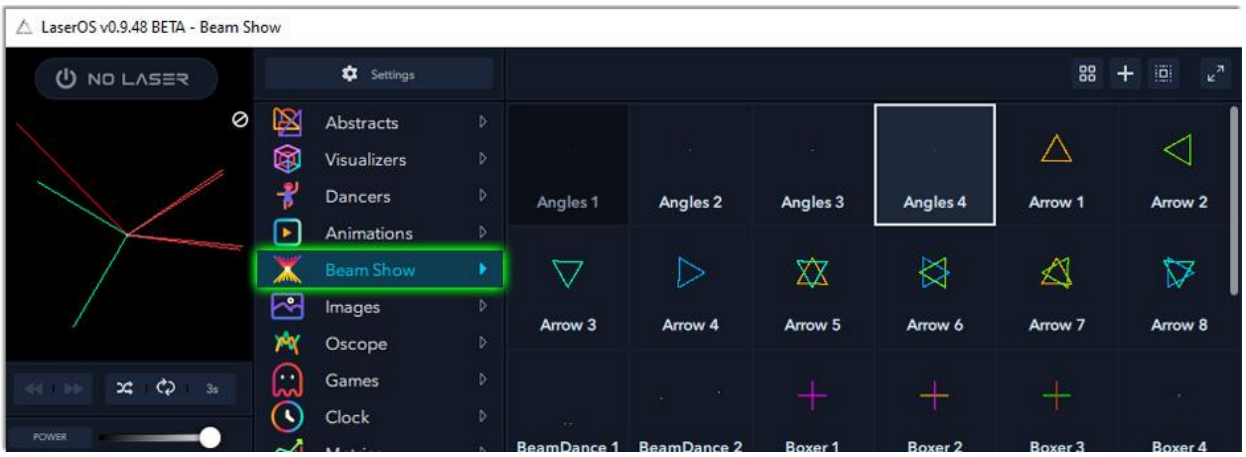
The Animations app contains animations grouped by categories such as Valentine's Day, Birthday, Christmas, New Year, EDM, Covid, Diwali, and many more. When the app is selected, click on any group in the selection panel to step into the group folder and see individual animations. Use the "Back" button at the top of the selection panel to move your view back to the top (group) level.



Beam Show

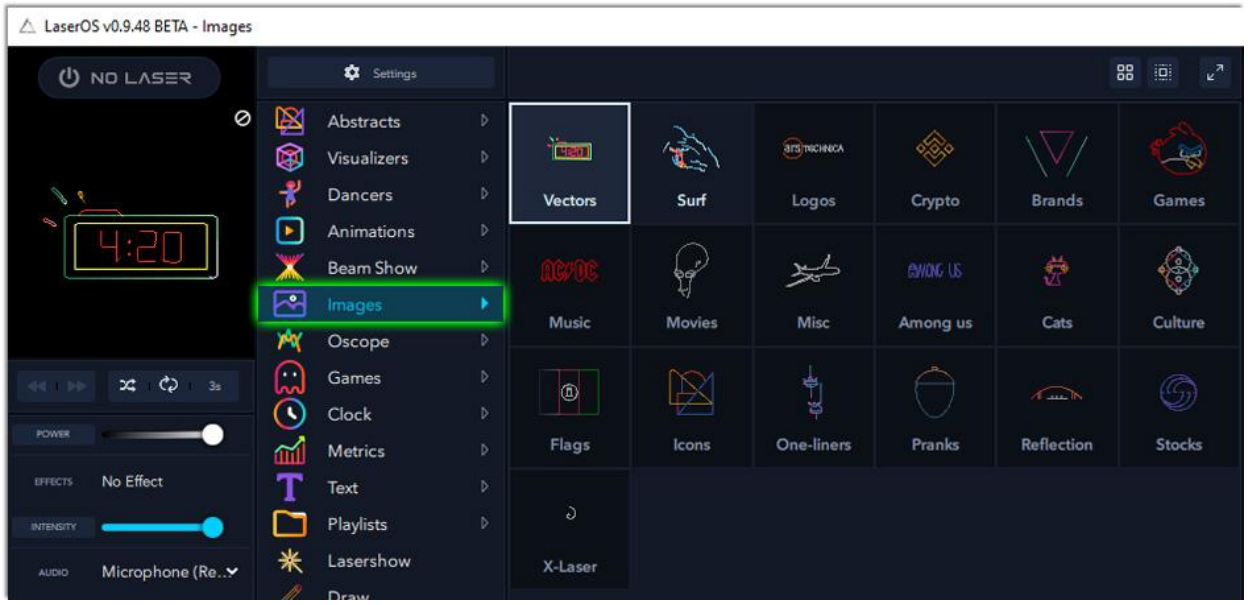
The Beam Show app displays beautiful laser beams that work particularly well in a foggy or smokey venue such as a concert or dance club.





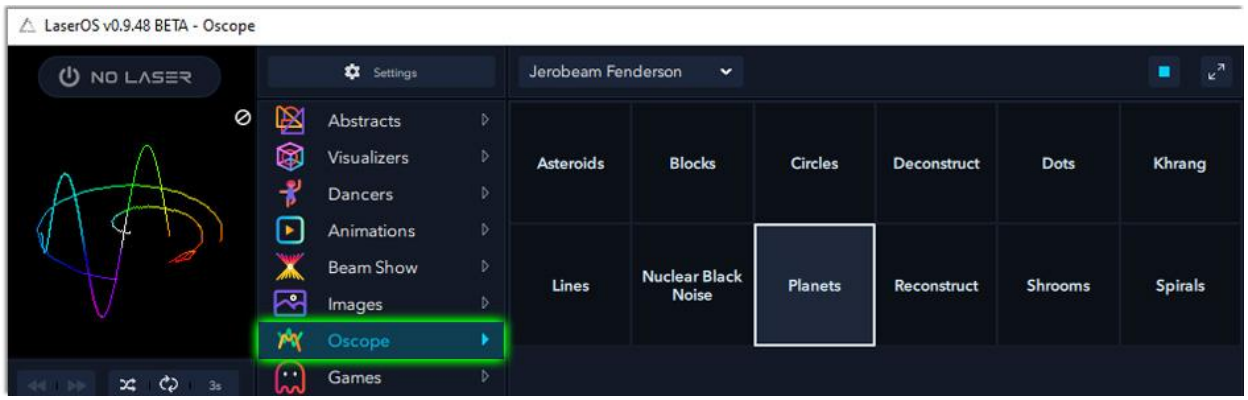
Images

The Images app contains hundreds of images grouped by category. Movies, vectors, logos, flags, and many more groups are available.



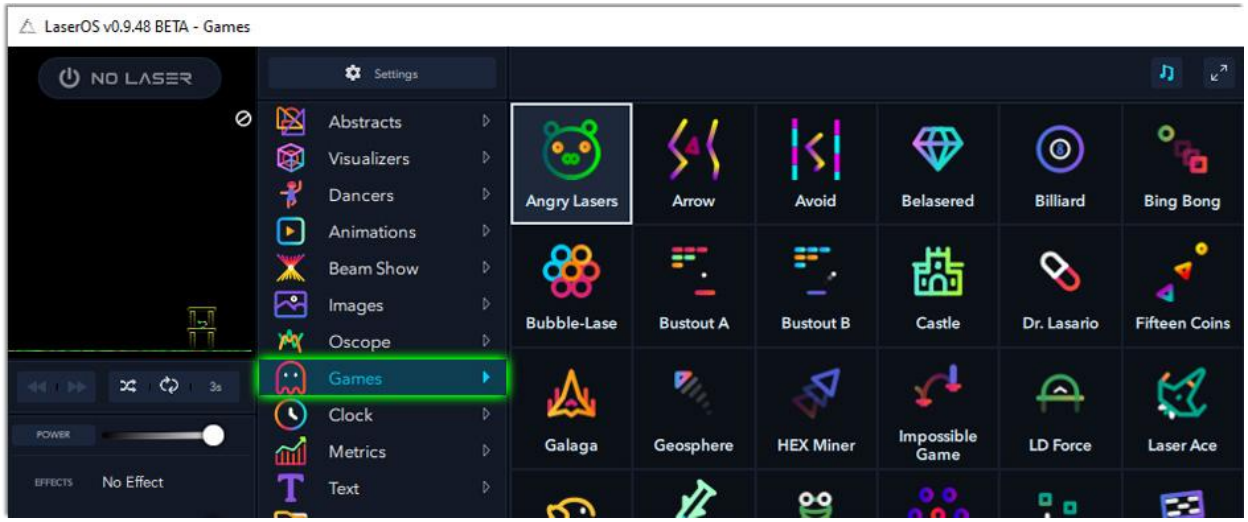
Oscope

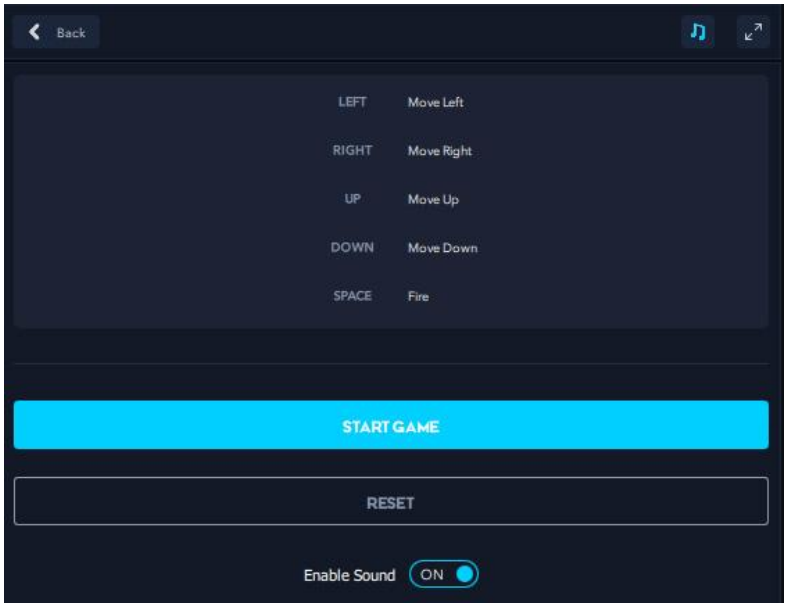
The Oscope app contains complete laser shows, including music. These are a great go-to for demonstrating some of the capabilities of your LaserCube device or entertaining an audience.



Games

The Games app contains many games you can play on your LaserCube device. Select a game and use the controls on your keyboard, or connect an optional game controller to your computer.

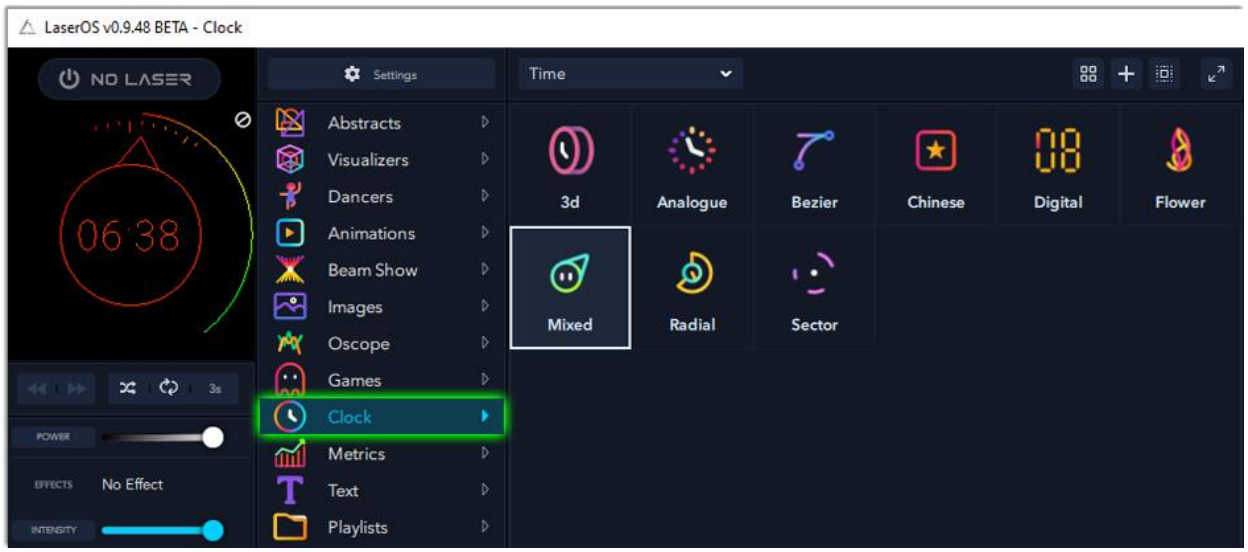




When a game is selected, control information and options are displayed.

Clock

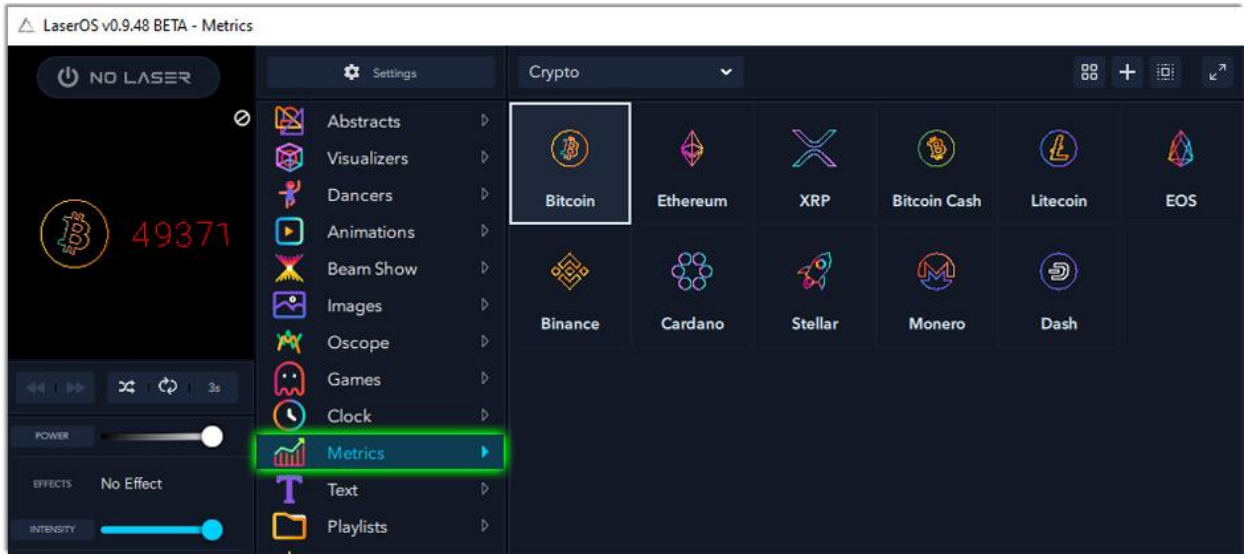
The Clock app allows you to display the time in the coolest way possible: with lasers! Project onto a wall or other surface.



As always, a single clock may be selected or they can be shuffled using the controls directly under the preview panel.

Metrics

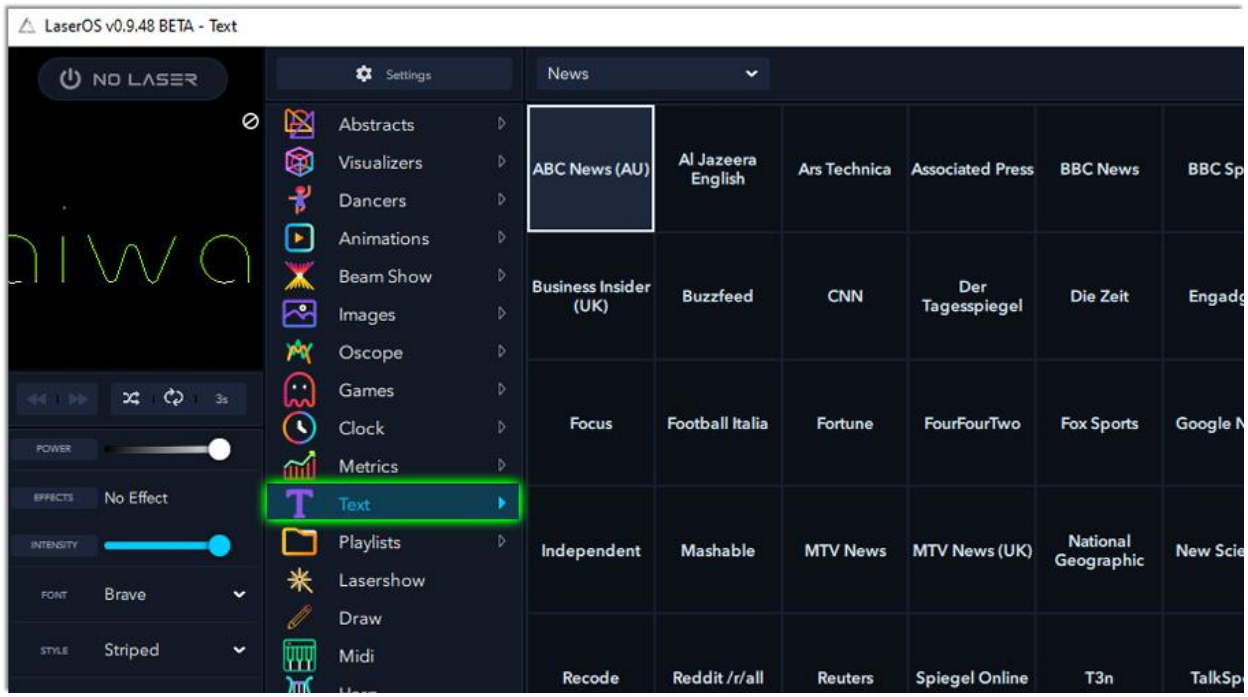
The Metrics app enables you to display useful information such as the covid infection rate by country, stock prices, social media feeds like twitter, youtube, or facebook, and crypto prices.



Select the Metrics app and use the pull-down menu in the selection panel to see available metrics for display. Your computer must be connected to the internet to access current metric values such as stock prices.

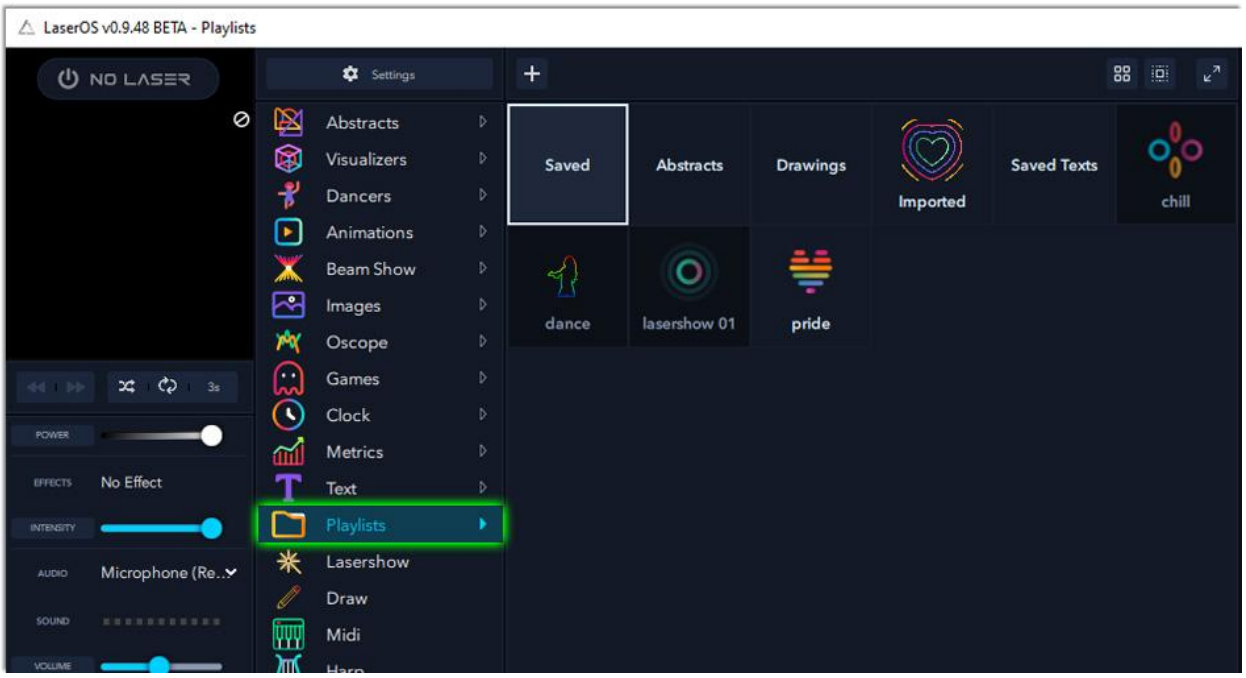
Text

The Text app displays current news, RSS feeds, reddit, or even custom text.



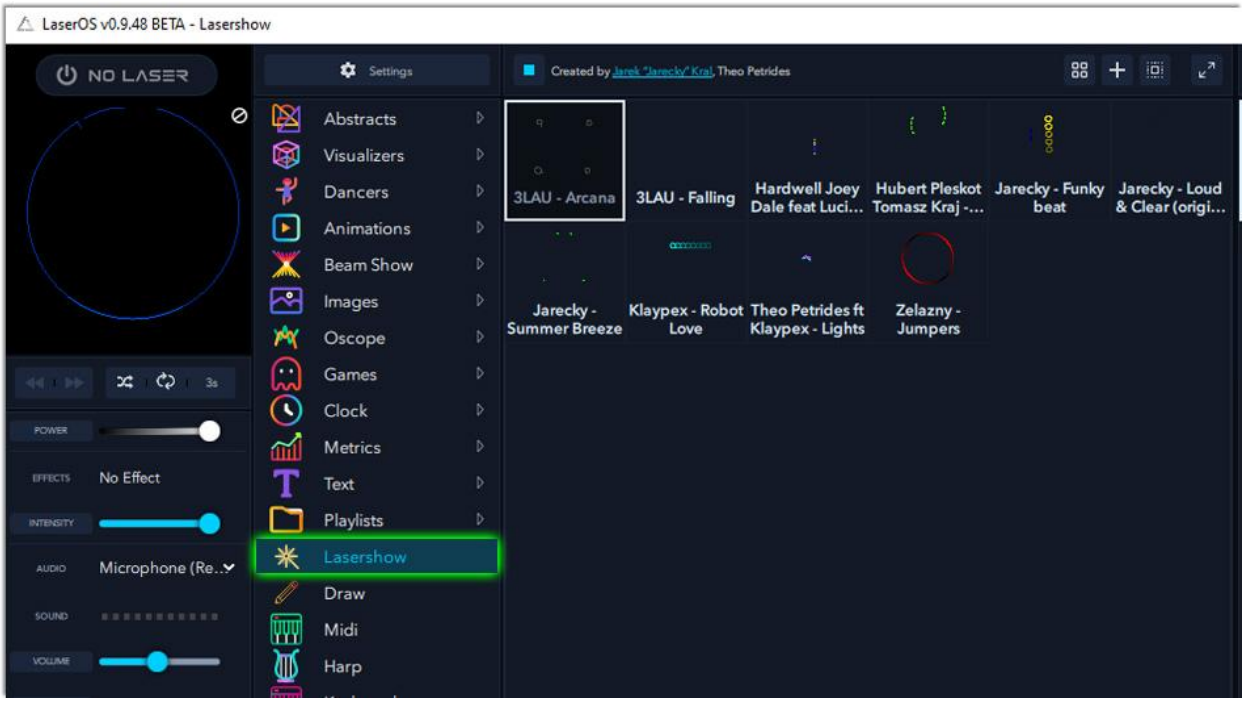
Playlists

The Playlists app contains all of your custom playlists. You can create fully custom playlists across groups and apps, then display them here for your lasershow.



Lasershow

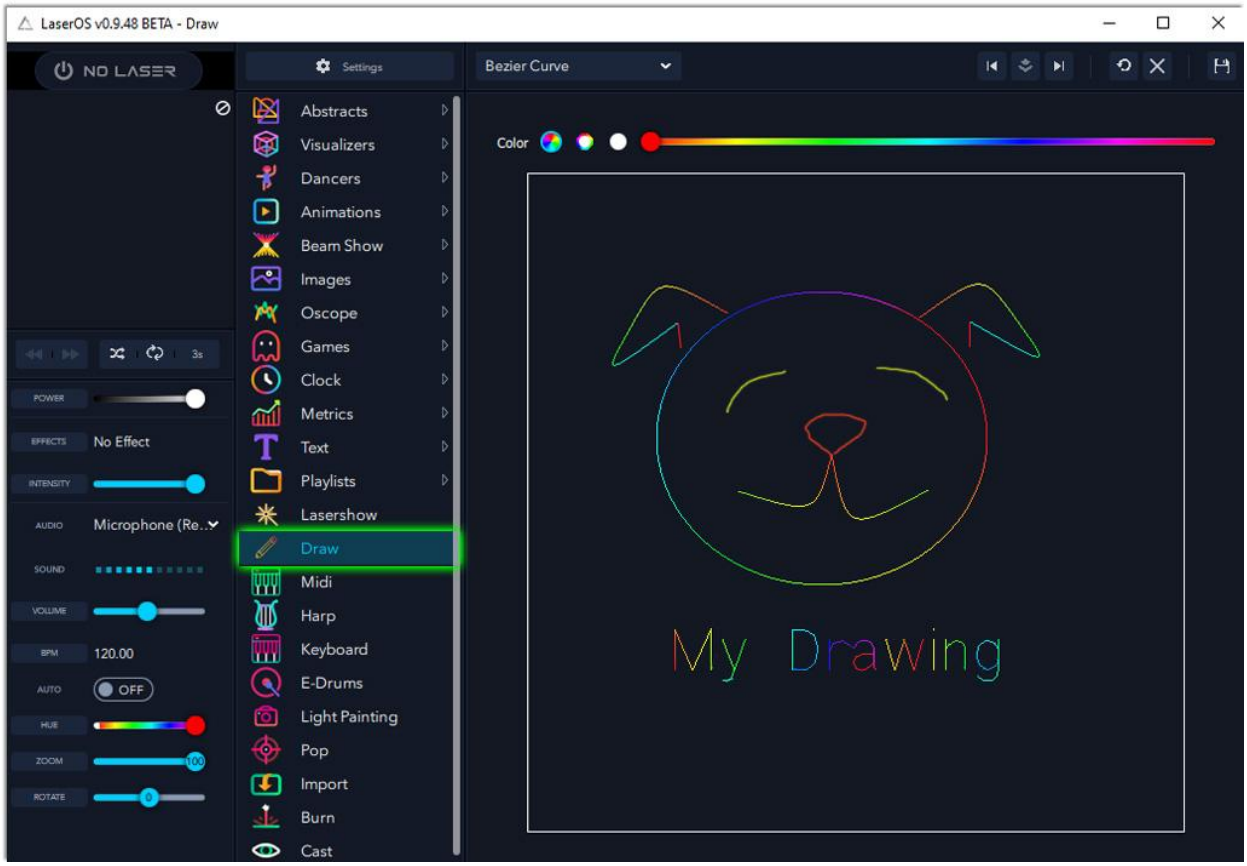
The Lasershow app contains several complete lasershows with music and audio-reactive animations.



Select one or more lasershows, and click on the play button above the selection panel. Lasershows may also be added to a playlist, or enabled for shuffle/autoplay.

Draw

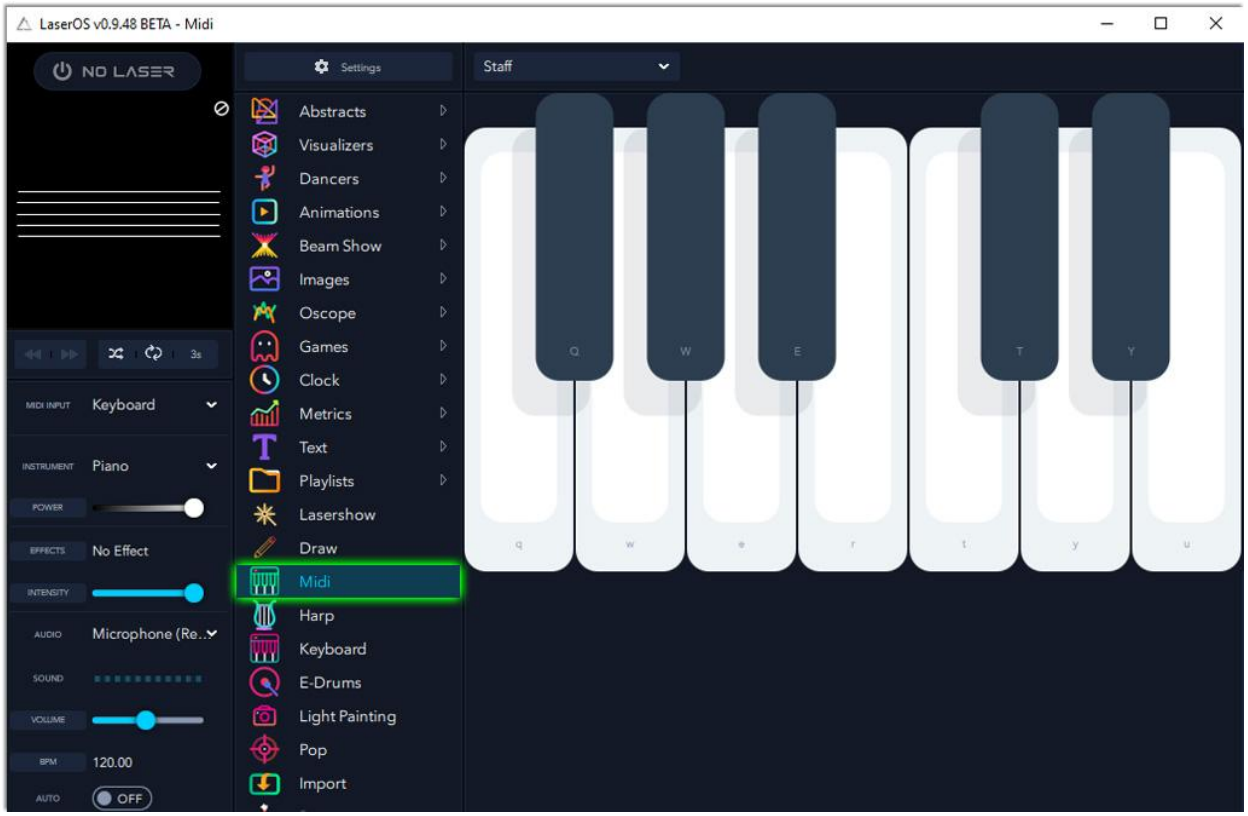
The draw tool allows you to create your own drawings and project them with your lasercube. When the draw app is selected, there are a number of drawing tools at your disposal: Pencil, Line, Bezier Curve, Rectangle, Ellipse, and Text. Be creative!



Drawings can be saved by clicking on the floppy disk icon which appears in the upper right portion of the draw app.

Midi

The Midi app is a musical and laser light instrument. A number of options and inputs are available, from a laser-projected musical staff with QWERTY keyboard input to amazing 3D shapes displayed with each musical key press.

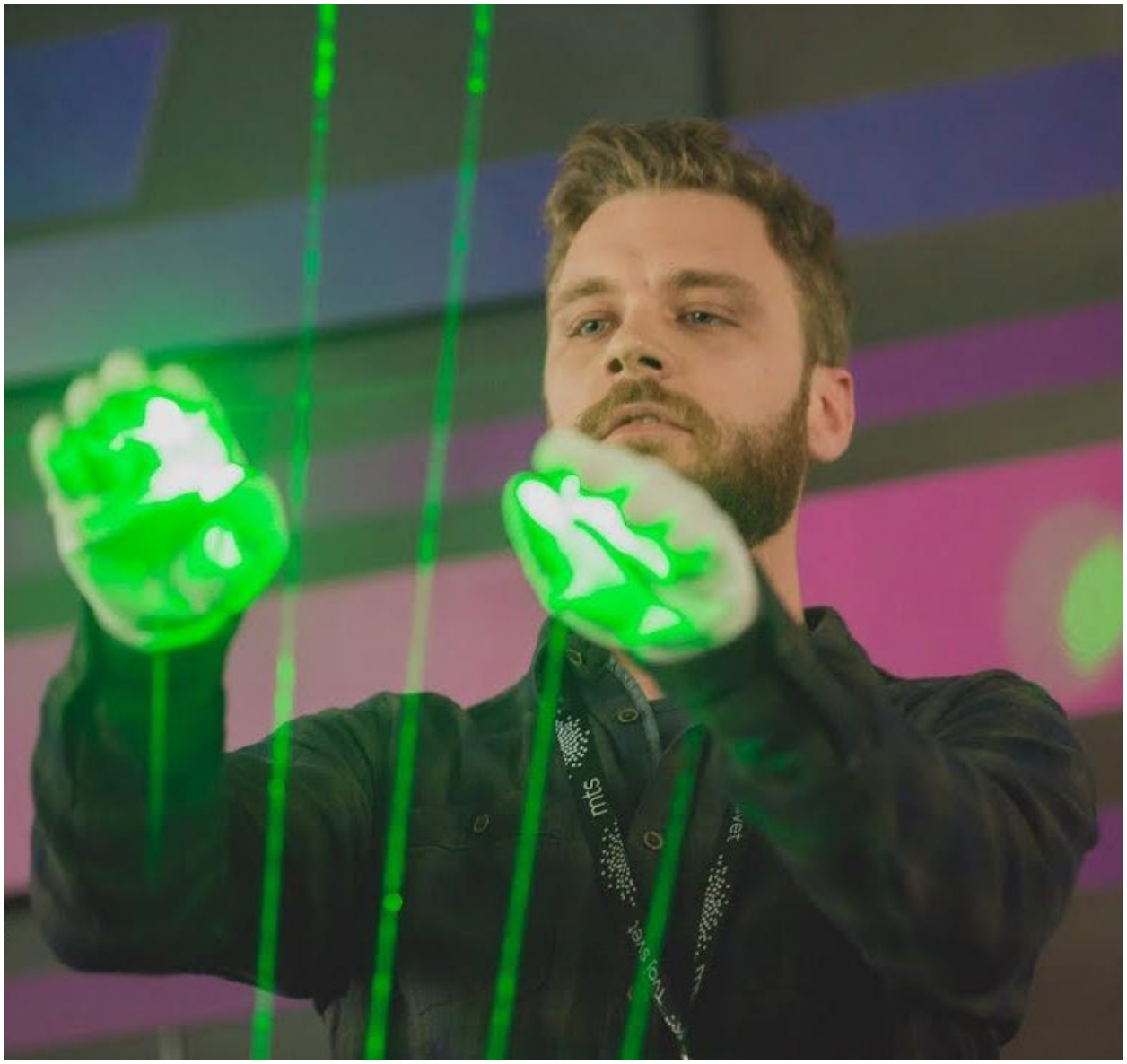


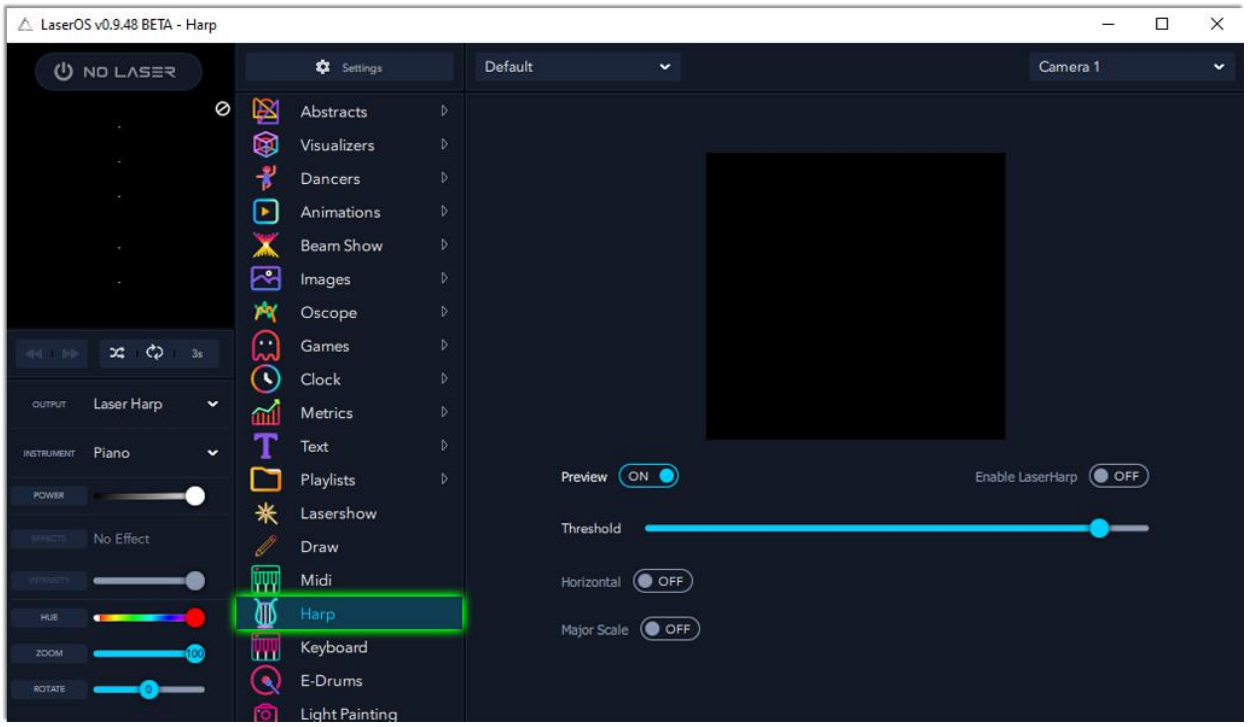
While the Midi app is selected, us the pull-down menu in the selection window to set your preferred display mode.

Keyboard keys corresponding to the piano notes displayed are indicated on each piano key.

Harp

The Harp app is another laser light and musical instrument. In this app, the input is created when your hands block beams of light.

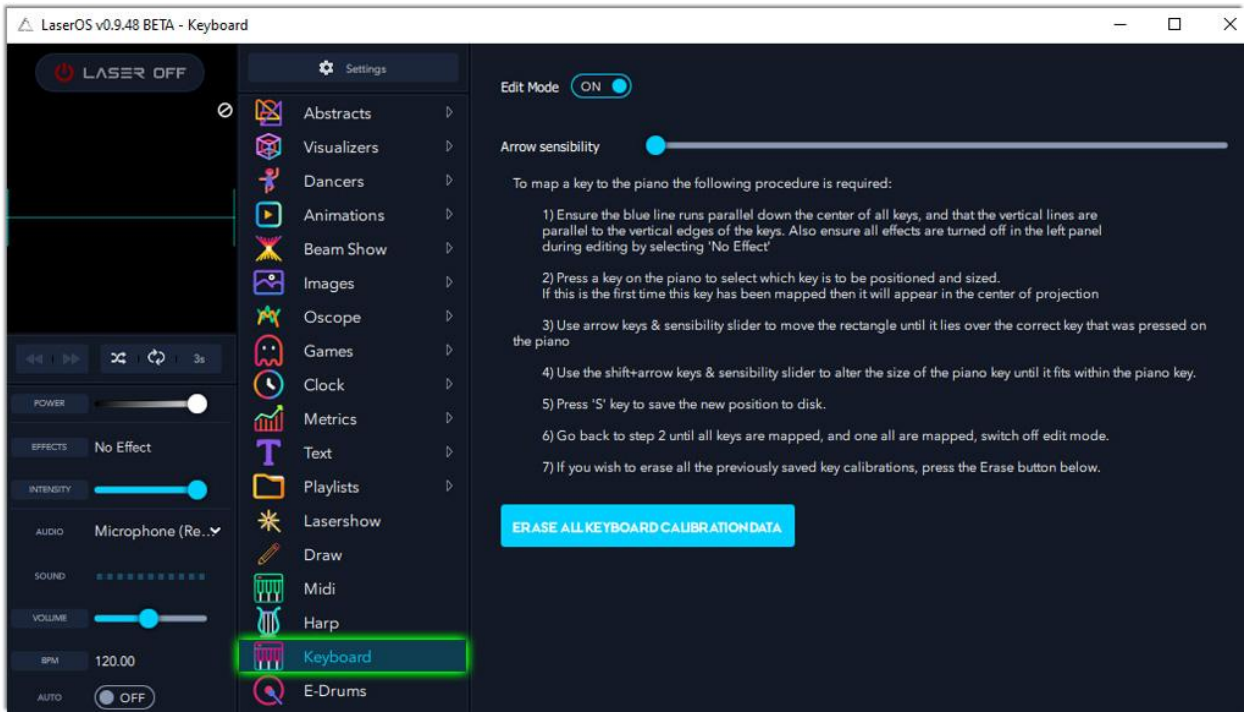




A camera input is required to use the Harp app. To set it up, turn on your LaserCube. In the Harp app, toggle the Preview switch to ON. Point your webcam at the dots projected by your LaserCube. If necessary, adjust the threshold slider until the dots seen by your webcam are distinctly seen in the preview window. Toggle “Enable Laserharp” to ON.

Keyboard

The Keyboard app lights up the keys on your piano or other keyboard instrument with laser light. Before using, the keyboard must be set up correctly.



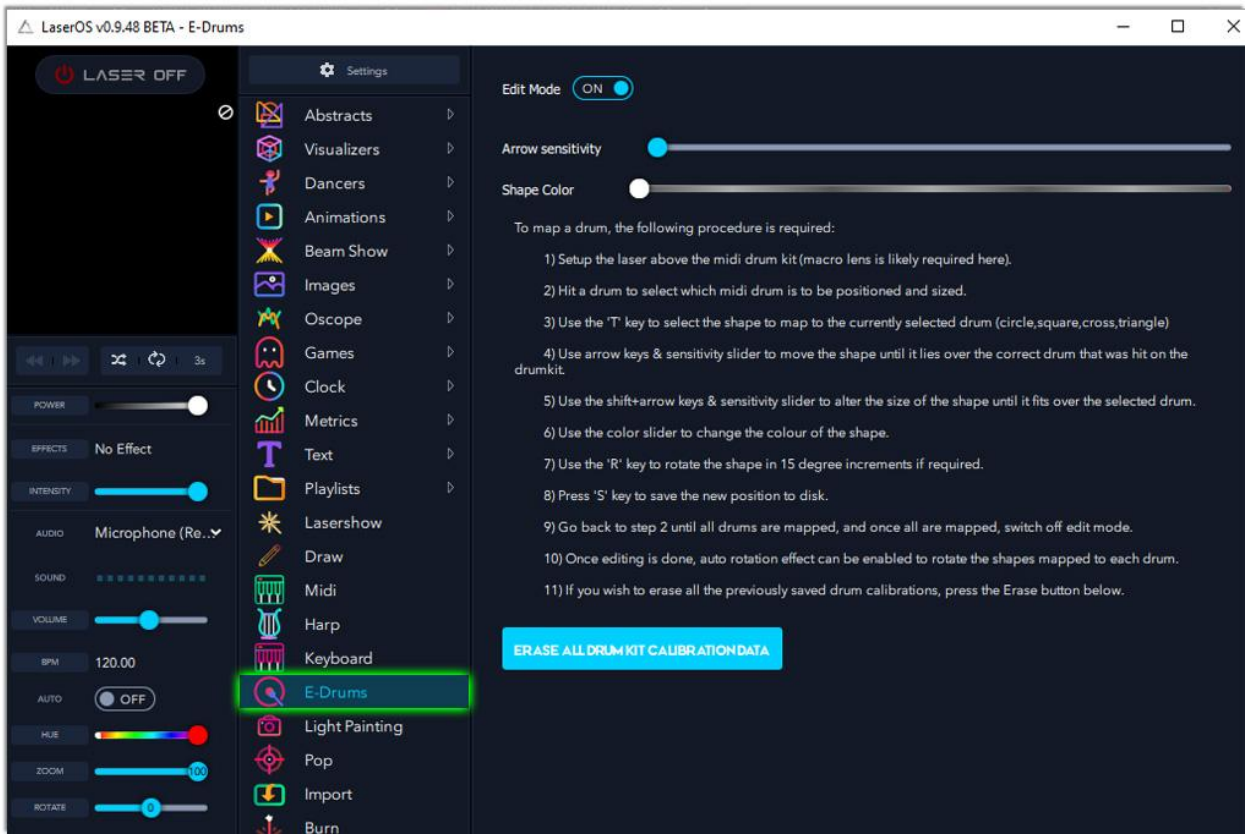
To set up the Keyboard app, position your LaserCube to project onto your keyboard. Then in LaserOS select the Keyboard app, go into edit mode, and follow the instructions.

For guidance setting up the Keyboard app, we have created this video:

https://youtu.be/fzv2WzhV1os

E-Drums

The E-Drums app lights up your midi-compatible drumset while you play.



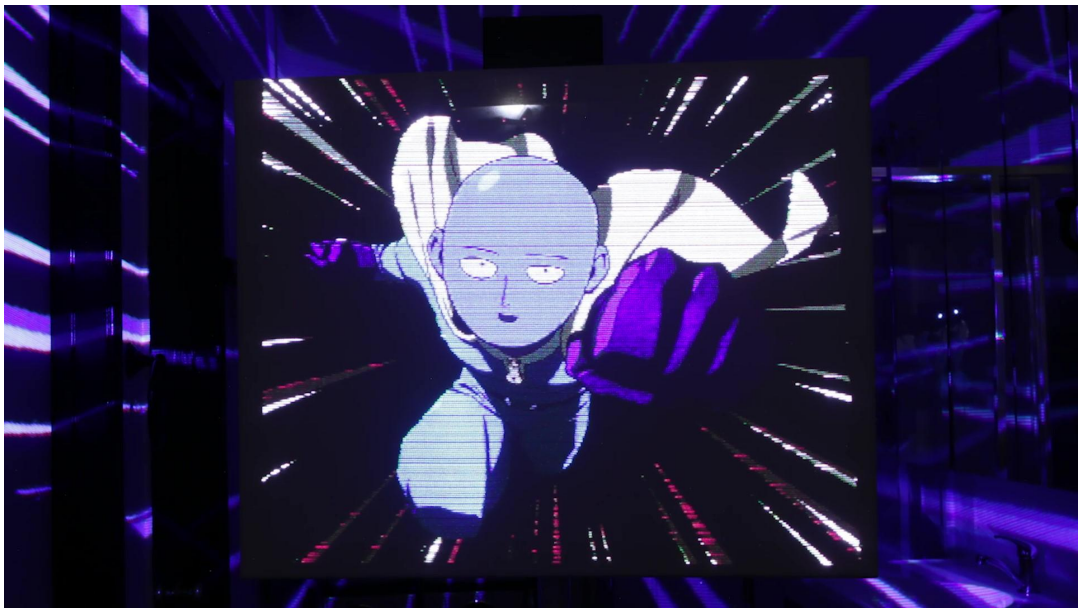
Similar to the Keyboard app, the E-Drums app must be set up correctly before playing. The LaserCube must be set up such that it can project over all of the drums you wish to light up. If necessary, the optional macro lens may be used.

The midi input in the LaserOS settings mode must match the midi output of your drum kit. For further guidance, we have created this video: https://youtu.be/_SZEGPqY0Eg

Light Painting

The Light Painting app is great for photographers. Using an imported image, the LaserCube creates a line-by-line display intended to be captured via long exposure photography.

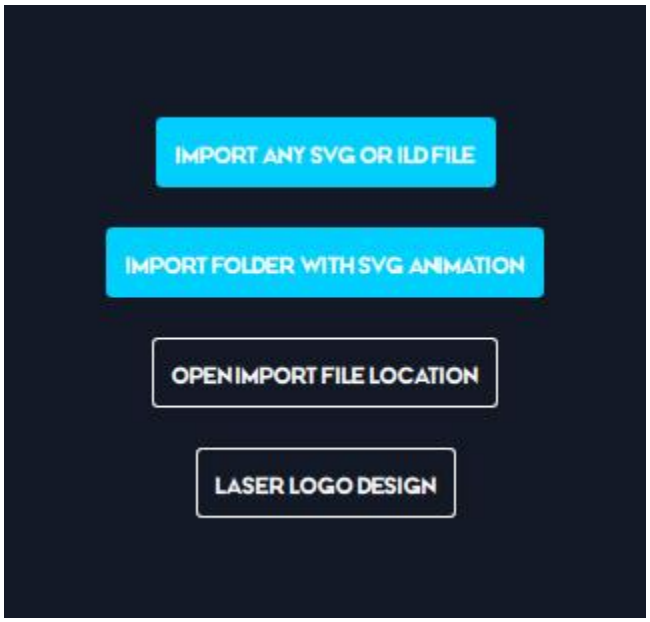
In the Light Painting app, import an image and set the start delay and exposure time using the sliders.



A text tutorial is available in-app, and we have created this video for further guidance: https://youtu.be/tk7jr3I9PyQ

Import

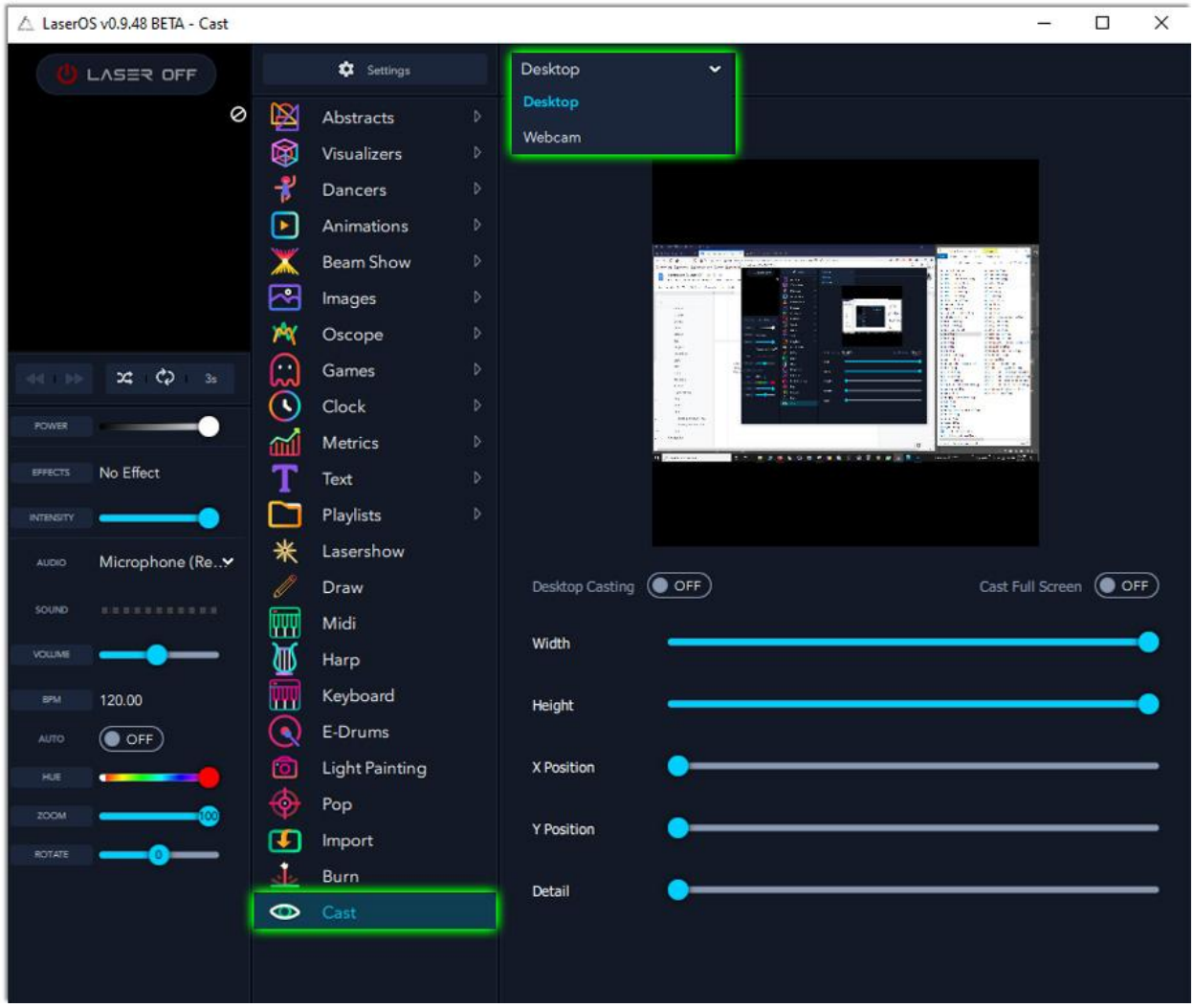
The Import app allows you to import SVG or ILD files, or entire folders containing SVG animations.

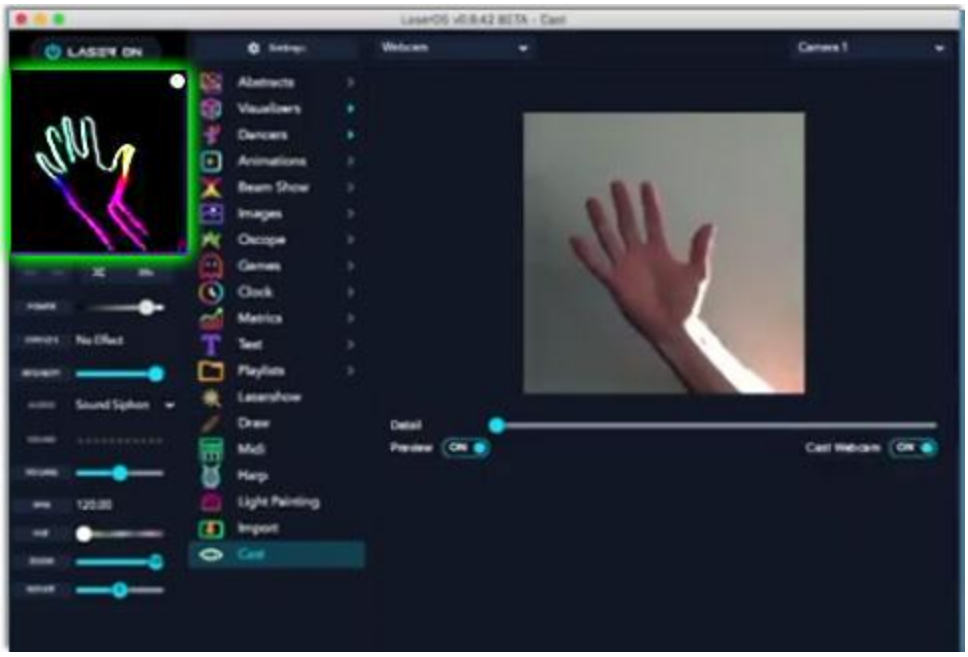


You can even have your company logo made into a Laser Logo Design.

Cast

The Cast app allows you to cast your computer screen to your LaserCube projector.





Alternatively, you can cast images directly from a webcam connected to your computer.

You can also adjust the projected image settings using the width, position, and detail sliders within the Cast app.

A video tutorial on the Cast app is located here: https://youtu.be/jLj1UxnGZ3w