PI BY SAHARTY

PI MEDIA SERVER

Video, LED, mapping and show control



USER MANUAL

Version 1.4.4 · macOS & Windows

www.pi-ware.com · support@pi-ware.com

Precision is a constant.

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WELCOME

Pi Media Server by Saharty is a real-time media server for live shows. One application runs your visuals deck, projection and 3D mapping, LED pixel mapping and LED-wall design, LED processor control, lasers, immersive audio, AI-generated looks and complete show control over MIDI, OSC, DMX, SMPTE timecode, TCP/UDP and a web remote.

It is built for the person at the media desk: VJs, video and LED technicians, projection designers, show programmers, corporate and conference operators, and venues that need one dependable machine to drive several screens, LED walls and lasers in sync with the music or the timecode.

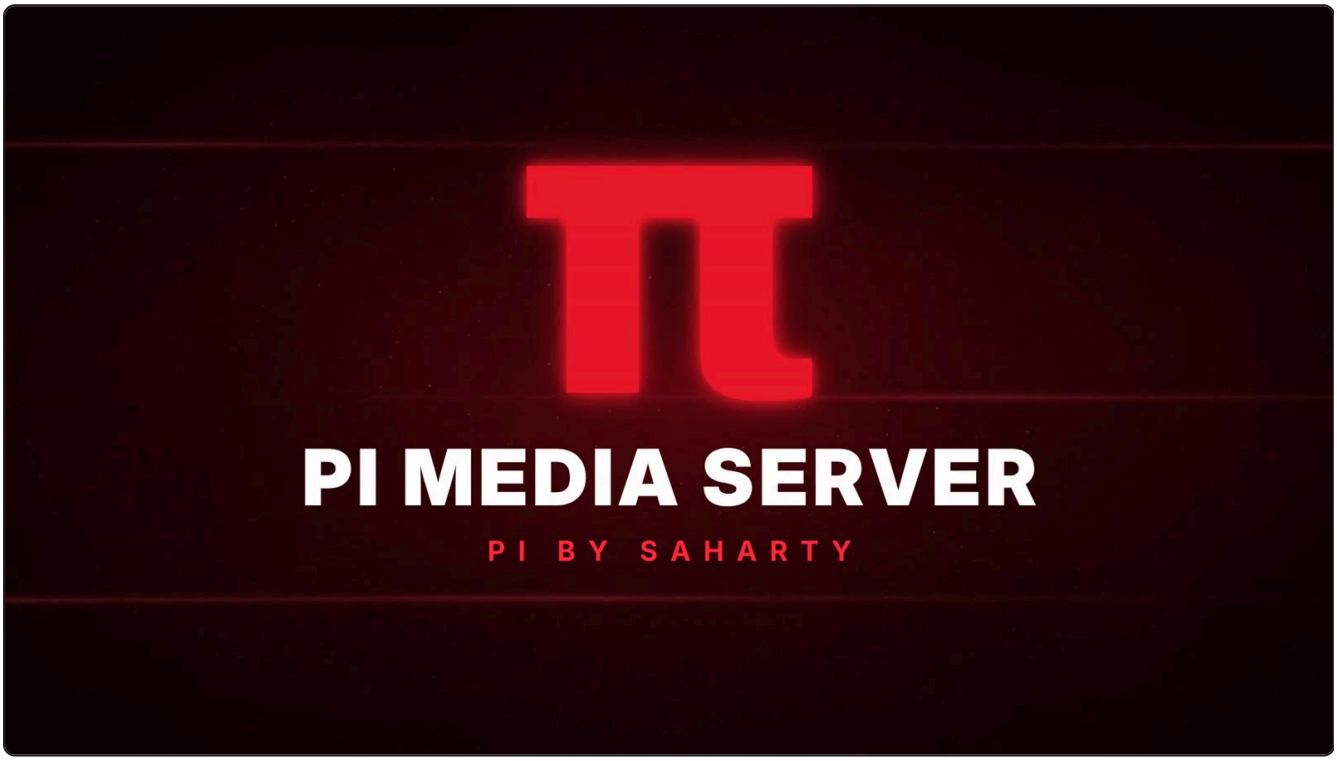


Figure 1. Pi Media Server by Saharty

Version 1.4.4 includes the full feature set described in this manual, including:

- A GPU clip deck up to 12K with DXV3 and HAP decoded on the graphics card, 51 GPU effects, 24 generators, and **Preview** / **TAKE** to build the next look privately.
- Smart LED tools: a calculator for raster, viewing distance, ports, power and weight; curved walls snapped to real cabinet curve locks; sweet-spot correction; and direct control of NovaStar COEX, Megapixel HELIOS and Brompton Tessera processors.
- Laser cues on tracks with direct output to Ether Dream, LaserCube and IDN devices, live auto-trace and timecode lock.
- Immersive audio with speaker layouts up to 9.1.6, ADM BWF object-based masters, 3D audio objects and binaural headphone monitoring.
- **Finger Paint** clips and painted masks that you can draw with a mouse, a pen, a touch screen or several phones at once.

- AI Studio: an offline engine that turns a prompt into a live generative look, plus optional cloud models for photoreal video and images.

> **Tip:** The 12-part tutorial series on youtube.com/@pibysaharty follows the same order as this manual. The figures in this manual are taken from it.

QUICK START

1. **Install** the app: open the `.dmg` and drag the app to **Applications** (macOS), or run the `.exe` installer (Windows).
2. **Launch** Pi Media Server. In the licence window, enter your licence key and click **Activate**, or click **Start 15-day free trial**.
3. In the **Compose** workspace, click the **Layers / Columns** corner of the deck to open the composition settings and pick a **Resolution** that matches your screen, LED wall or projector setup.
4. Drag video, images or audio files from your computer onto empty cells in the deck, or choose **File → Import Media...** (Cmd/Ctrl+I).
5. In the **Browser**, open the **Generators** tab and drag a generator (for example **Plasma** or **AI Synth**) onto another cell.
6. Click a clip to play it. Click a column header, or press **1**–**9**, to trigger a whole column.
7. Open the **Mapping** workspace, select **Output 1**, choose your projector or LED processor in **Display**, and click **Open Output**.
8. Use the layer faders, the **Master** fader and **BLACK** in the top bar to shape the show.
9. Save with **File → Save Show** (Cmd/Ctrl+S). Shows are saved as `.pims` files.

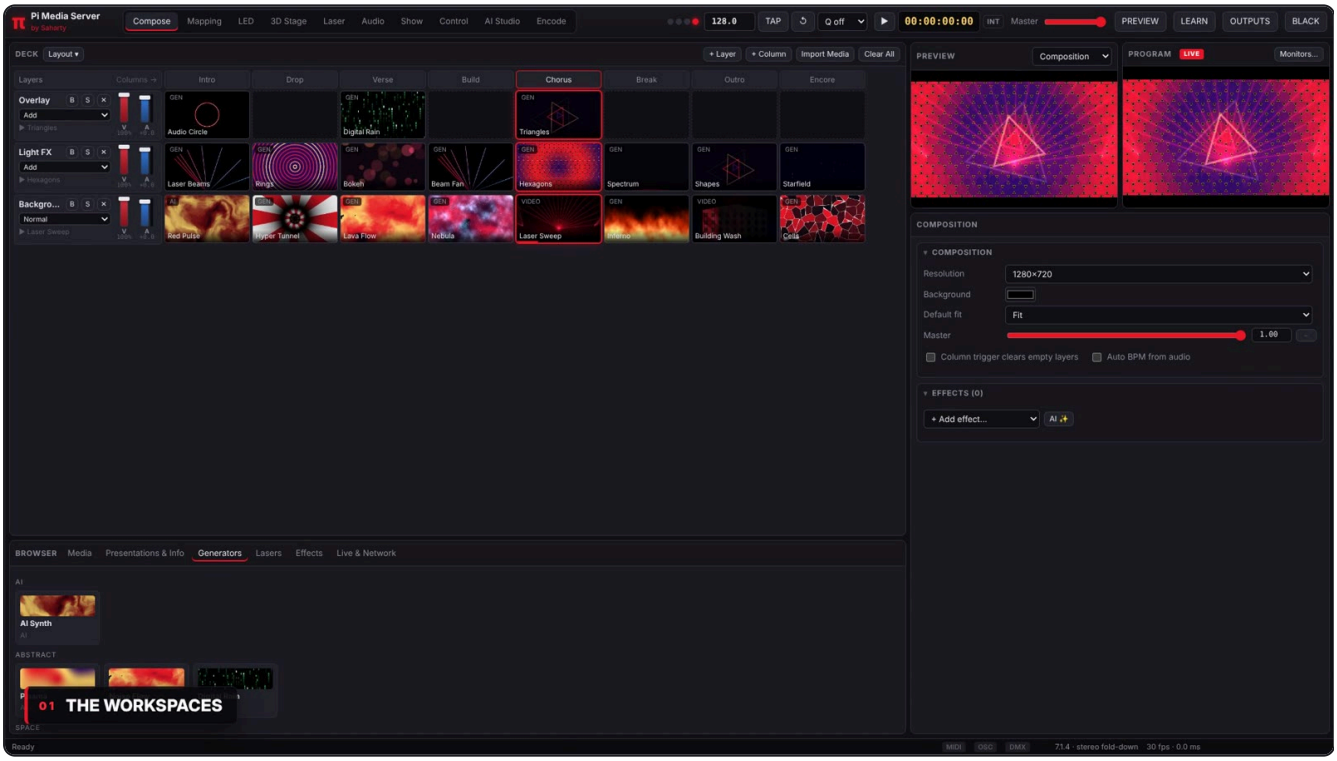


Figure 2. The Compose workspace: deck, browser, Preview and Program monitors, and the inspector

INSTALLATION

macOS

1. Open `PiMediaServer-1.4.4-mac-arm64.dmg` (Apple silicon) or `PiMediaServer-1.4.4-mac-x64.dmg` (Intel Mac).
2. Drag **Pi Media Server by Saharty** onto the **Applications** folder shown in the window.
3. Eject the disk image and start the app from **Applications** or Launchpad.

On first use, macOS asks for permission to use:

- the **microphone / audio inputs**, used for SMPTE LTC timecode and audio-reactive visuals;
- the **camera**, used for live camera sources and for LED / projector auto-calibration;
- the **local network**, used for OSC, Art-Net, sACN and laser DACs (Ether Dream, LaserCube, IDN).

Allow each one you plan to use. You can change them later in **System Settings → Privacy & Security**.

Windows

1. Run `PiMediaServer-1.4.4-win-x64.exe`.
2. Accept the licence agreement, choose the installation folder (you can change it) and finish the installer.
3. The installer creates a desktop shortcut and a Start-menu entry named **Pi Media Server by Saharty**.

If Windows Firewall asks, allow Pi Media Server on the network you use for show control, LED output and sync.

What is included

Everything the app needs ships inside the installer, including FFmpeg and the NDI runtime. You do not need to install any other software.

Show files use the `.pims` extension and open in Pi Media Server when you double-click them.

First launch

The splash screen shows **Starting GPU engine…** while the graphics engine starts. A new show contains a 1920 × 1080 composition at 120 BPM, 3 layers and 8 columns.

ACTIVATION & LICENSING

Pi Media Server uses the Pi by Saharty licensing system. One licence activates one computer, and you can move it to another computer at any time.

Buying and receiving your key

Buy Pi Media Server at **pi-ware.com/products/pi-media-server**. Your licence key arrives by email after purchase and has the form `XXXXX-XXXXX-XXXXX-XXXXX`. Your licences, downloads and orders are listed in your account at **pi-ware.com/account**.

Opening the licence window

- macOS: **Pi Media Server → Licence...**
- Windows: **Help → Licence...**
- On either system: click the licence banner below the top bar, or the licence entry in the status bar.

Online activation

1. Open the licence window.
2. Paste your key into **Licence key** and click **Activate** (or press Enter).
3. The status line changes to **Activated** and every feature is on.

If the key is already active on another computer, the app asks whether to move it to this one. Click **Move it here** to confirm. The other computer gets a 24-hour notice, then Pi Media Server stops starting there.

Free trial

Click **Start 15-day free trial**. No payment details are needed. During the trial every feature works, with two limits:

- every picture (outputs, monitors, LED, streams, recordings and encoded files) carries a watermark;
- shows cannot be saved.

The licence window shows how much of the trial is left. A notice appears 3 days before the trial ends.

Offline activation

Use this when the media computer has no internet connection.

1. Enter your licence key in the licence window.
2. Click **Offline activation**. A request code appears.
3. Click **Copy code** and take the code to any device that is online.
4. Paste the code at **pi-ware.com/activate**. You receive a licence file.

5. Bring the file back to the media computer and click **Load licence file...**.

Moving to a new computer

- In the app: click **Deactivate this computer** in the licence window. Pi Media Server keeps running until you quit, and then does not start on that computer until it is activated again. You can then activate the key on the new computer.
- If the old computer is lost or broken: deactivate or reset its machine from your account at **pi-ware.com/account**, or simply activate on the new computer and confirm **Move it here**.

Licence checks and show safety

- The app checks the licence whenever it has an internet connection: at launch, then every 60 minutes, and every 2 minutes while offline. Offline, it keeps working with no time limit.
- **The 24-hour rule:** features are never limited without at least 24 hours of notice on that computer, whatever the reason (licence moved, trial ended, refund, deactivated from the account). During the notice everything works, and a banner shows the message and a countdown.
- **A running show is never cut.** A session that started with a valid licence or trial keeps running until you quit the app.
- Without an activation or running trial, the app opens only the licence window: you can activate, start the trial, buy a licence or quit.

The licence file is stored at `~/Library/Application Support/Pi by Saharty/Licences/pi-media-server.pilic` (macOS) or `%APPDATA%\Pi by Saharty\Licences\pi-media-server.pilic` (Windows). Do not edit it. An edited file is no longer valid.

INTERFACE TOUR

The top bar

The top bar is visible in every workspace.

Control	What it does	Range / default
Workspace tabs	**Compose**, **Mapping**, **LED**, **3D Stage**, **Laser**, **Audio**, **Show**, **Control**, **AI Studio**, **Encode**	Compose
Beat lights	Show the four beats of the bar	—
BPM	Show tempo	20–300, default 120
TAP	Tap tempo (key **T**)	—
↻ (resync)	Resets the beat to beat 1	—
Quantise	Delays clip triggers to the next beat or bar	**Q off**, **Q beat**, **Q bar**
Timecode display	Shows the show timecode. Click it to choose the source, frame rate and locate point	00:00:00:00
▶ (timecode play)	Plays / stops the internal timecode generator (Shift+Space)	—
Master	Composition master opacity	0–1
PREVIEW	Preview mode: edit and trigger without touching the live output (Cmd/Ctrl+P)	Off
TAKE	Sends the preview to the live output (Cmd/Ctrl+Enter)	—
LEARN	Learn mode for MIDI, OSC and DMX mapping	Off
OUTPUTS	Opens or closes all outputs	—
BLACK	Blackout (key **B**)	Off

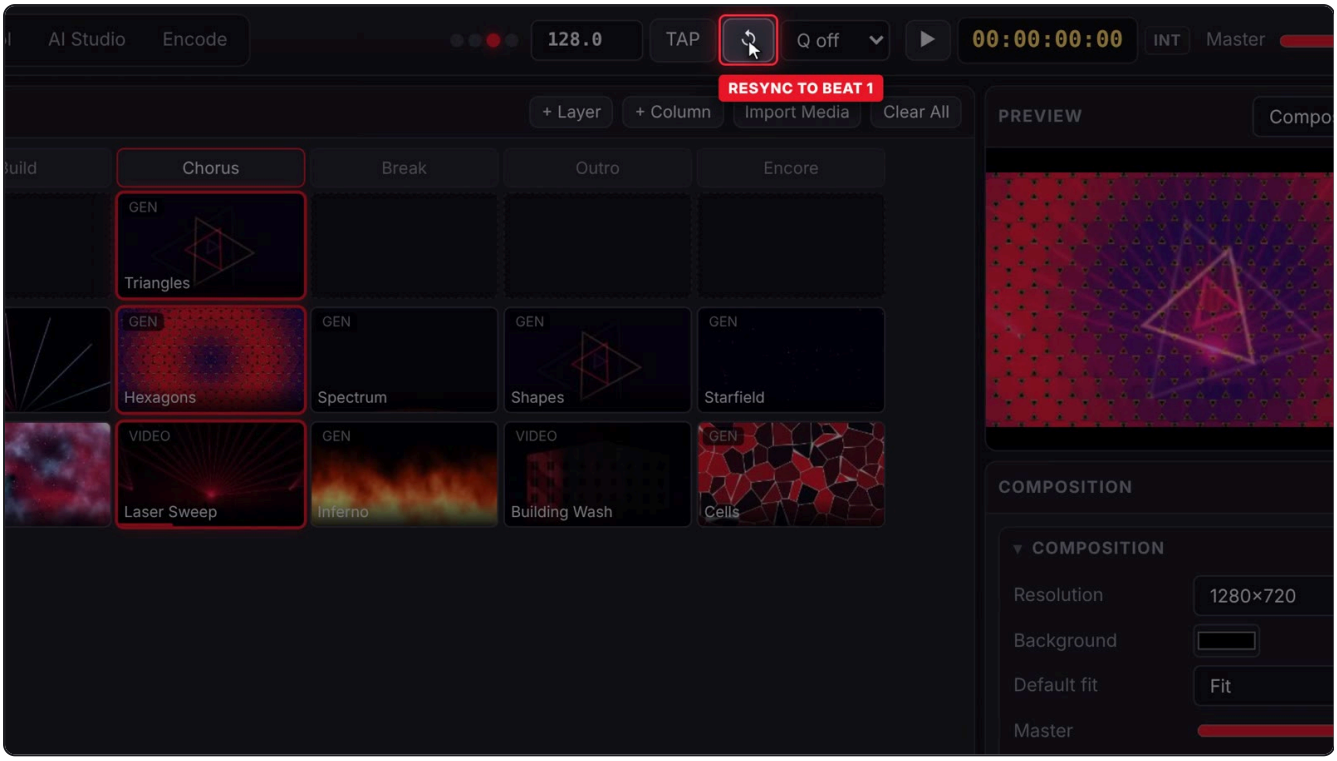


Figure 3. The top bar: tempo, quantise, timecode, master and the PREVIEW / TAKE / LEARN / OUTPUTS / BLACK buttons

The status bar

The status bar at the bottom shows messages, MIDI / OSC / DMX activity lights, the graphics card name and the licence state. Click the GPU name to open **GPU & Performance**.

The Compose workspace

Compose is where you build and play the show. It has five panels:

- **Deck**: the grid of layers (rows) and columns. Top layers are drawn over lower layers.
- **Browser**: tabs for **Media**, **Presentations & Info**, **Generators**, **Lasers**, **Effects** and **Live & Network** sources.
- **Preview**: a monitor that can show the composition, the selected layer, any layer or any output.
- **Program**: always shows the live composition, with a **LIVE** or **BLACK** tag. **Monitors…** opens external monitor windows.
- **Inspector**: the settings of whatever you selected (a clip, a layer or the composition).

Arranging the panels

- Drag the gap between two panels to resize them.
- Drag a panel's title bar onto another panel to swap them.
- Double-click a panel title to maximise it.
- **Layout ▾** in the deck header offers presets (**Standard — Preview + Program**, **Monitors on top**, **Big deck**, **Monitors left**, **Classic — Preview only**), **Hide / Show Program monitor**, **Lock panels** and **External monitors…**. Layouts are saved on each computer.

Other workspaces at a glance

Workspace	What you do there
Mapping	Outputs, slices, corner pin, mesh warp, masks, edge blending, colour matching
LED	Pixel-mapped fixtures, Art-Net / sACN / DDP output, LED wall designer, smart calculator, curved walls, LED processors
3D Stage	Models, build-to-scale objects, virtual projectors, projector catalogue, calibration
Laser	Laser cues on tracks, drawing, ILDA, laser projectors, external laser software, safety
Audio	Output device, speaker layout, monitoring mode, speaker management, analysis for visuals
Show	**Cue List**, **Timeline**, **Plan (conference)**, **Schedule** and timecode
Control	MIDI, OSC, DMX input, web remote, TCP/UDP, multi-server, NDI and stream outputs
AI Studio	Prompt-driven looks, effects, Auto-VJ and cloud generation
Encode	Batch conversion to DXV3, HAP, H.264, H.265, AV1 and WAV

BUILDING A SHOW IN THE DECK

Adding clips

- **Drag files** from your computer onto a cell (that cell) or onto a layer header (the next free cell of that layer). Video, images and audio files (WAV, BWF, AIFF, MP3, FLAC and more) are all clips.
- Use **Import Media** in the deck header, **File → Import Media…** (Cmd/Ctrl+I), or right-click an empty cell and choose **Import Media Here…**.
- Right-click an empty cell for **New Text Clip** or **New AI Synth Clip**.
- Drag anything from the **Browser** onto a cell.

Each filled cell shows a thumbnail, the clip name and a type tag. GPU-decoded clips show their codec (for example DXV3 or HAP); other tags are **GEN**, **AI**, **SLIDES**, **LIST**, **INFO**, **STREAM** and **NDI**. Video and audio clips show a progress bar while they play.

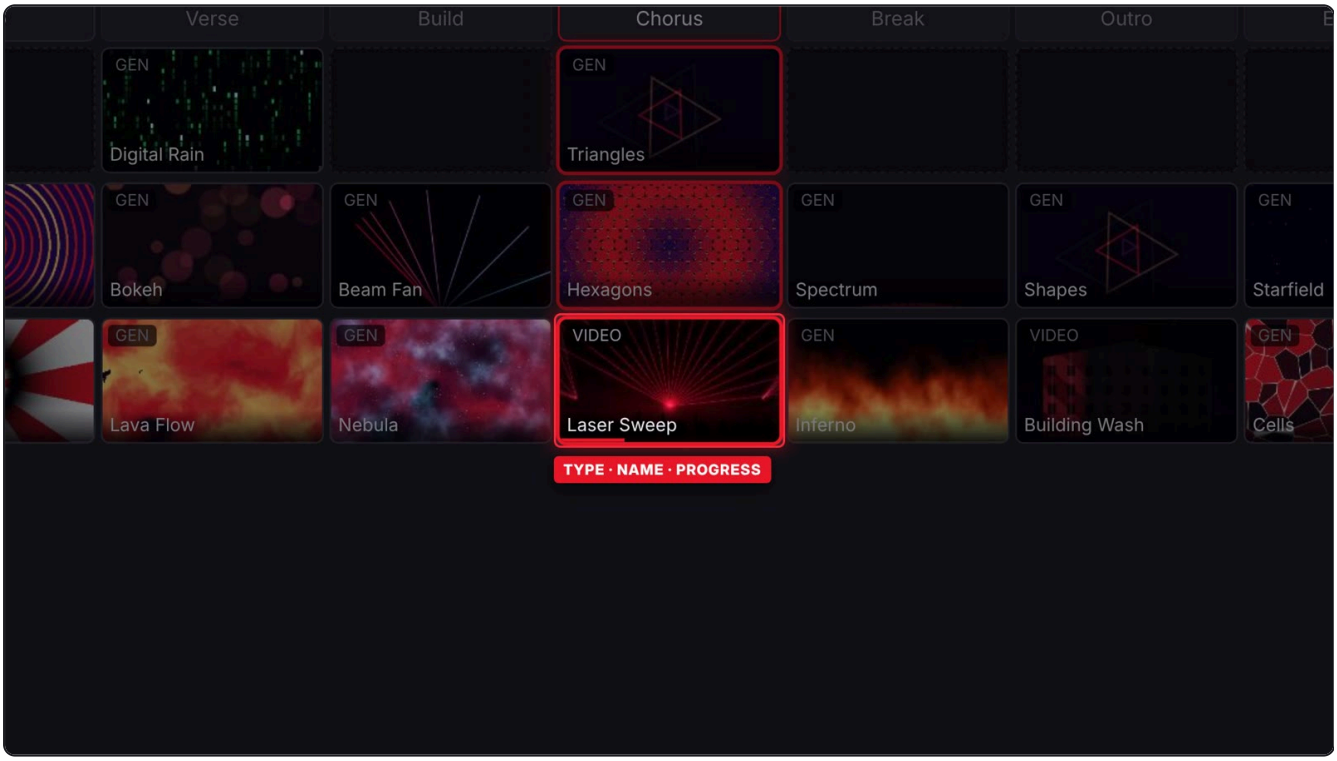


Figure 4. Clips in the deck: thumbnail, name and type tag

Playing clips and columns

- **Click a clip** to play it on its layer. A layer plays one clip at a time.
- **Click a column header**, or press **1**–**9**, to trigger every clip in that column.
- ✕ on a layer header clears that layer. **Clear All** in the deck header clears every layer.
- With **Column trigger clears empty layers** on (composition settings), a column also clears the layers that have no clip in it.

Organising the deck

- **+ Layer** and **+ Column** add rows and columns.
- Right-click a layer header: **Rename Layer**, **Add Layer Above**, **Move Up**, **Move Down**, **Delete Layer**.
- Right-click a column header: **Rename Column**, **Insert Column Before**, **Delete Column**.
- Right-click a clip: **Rename**, **Duplicate to Next Empty**, **Refresh Thumbnail**, **Show in Folder**, **Encode to DXV3 / HAP…**, **Timecode: Lock to Current TC**, **Timecode Settings…** and **Remove Clip**.
- Drag a clip to move it. **Alt-drag** to copy it. Press **Delete** to remove the selected clip.

Layer strips

Each layer header has:

Control	What it does	Range / default
Layer name	Click to select the layer and show it in the inspector	—
B	Bypass: hides the layer	Off
S	Solo: shows only this layer	Off
✕	Clears the layer	—
Blend mode	How the layer combines with the layers below	**Normal**, **Add**, **Screen**, **Multiply**, **Overlay**, **Lighten**, **Darken**, **Difference**, **Subtract**, **Exclusion**, **Hard Light**, **Soft Light**, **Color Dodge**, **Color Burn**, **Luma Key**, **Alpha Mask**
V fader	Video opacity	0–1, default 1
A fader	Audio level in dB, with a live level meter	up to +6 dB, default 0 dB

Drag a fader, use the mouse wheel, or Shift-drag for fine moves. Double-click a fader to reset it. Both faders can be learned from MIDI, OSC and DMX.

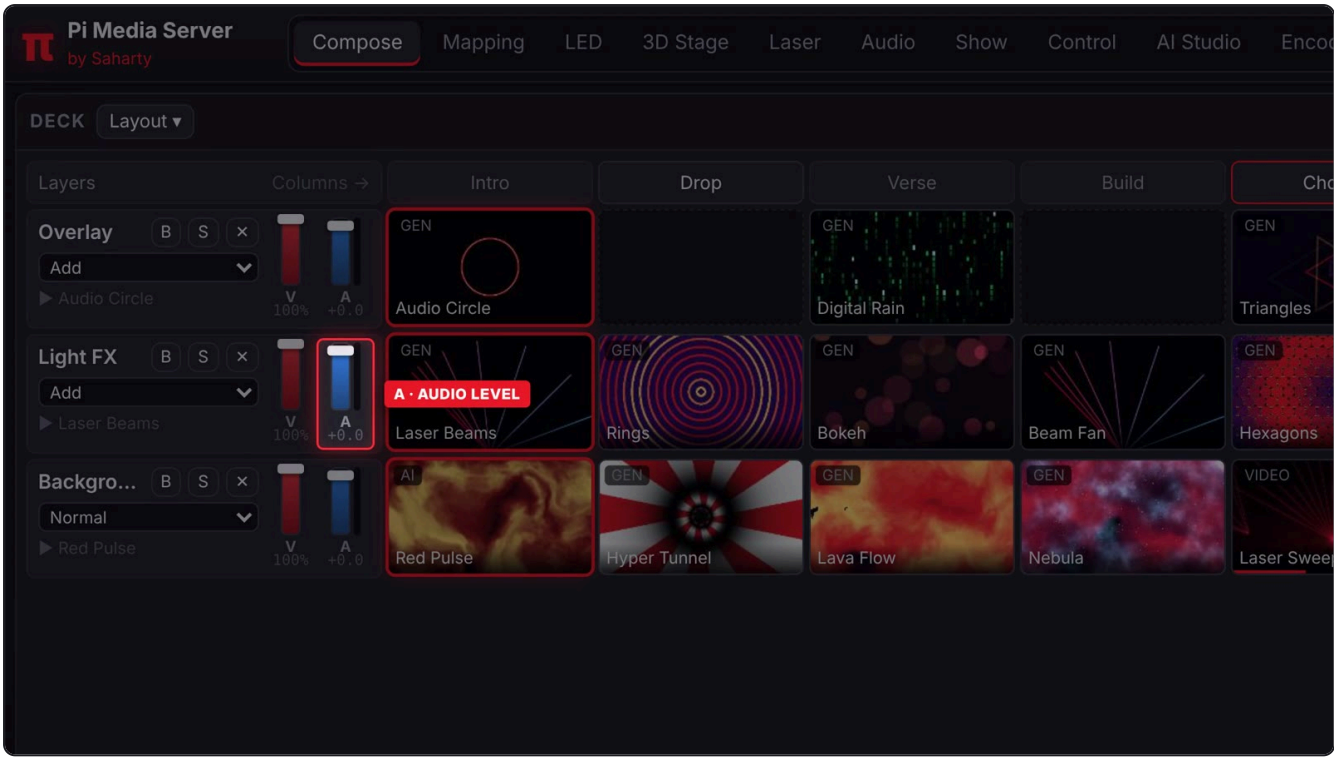


Figure 5. Layer strips: blend mode, video opacity (V) and audio level (A) faders

> **Tip: Alpha Mask** uses the layer as a cut-out for the layers below, and **Luma Key** removes the dark parts of the layer. Both are useful for logos and shapes over moving backgrounds.

Clip settings (inspector)

Select a clip to see its settings in the inspector.

Transport (video and audio clips)

Control	What it does	Range / default
Speed	Playback speed	0–4, default 1
At end	What happens at the end	**Loop**, **Bounce**, **Play once & hold**, **Play once & clear**
In point / **Out point**	Part of the clip that plays	0–1, default 0 / 1
Reverse	Plays backwards	Off
Beat sync length	Stretches the clip to a number of beats	Off
Length (beats)	Length when beat sync is on	1–128, default 16

Transform

Control	What it does	Range / default
Fit	How the clip fills the composition	**Comp default**, **Fit**, **Fill**, **Stretch**, **Native pixels**

Control	What it does	Range / default
Position X / Y	Offset	–2 to 2, default 0
Scale	Size	0.05–5, default 1
Rotation	Rotation in degrees	–180 to 180, default 0
Flip H / Flip V	Mirrors the clip	Off
Opacity	Clip opacity	0–1, default 1

Audio (clips with sound)

Control	What it does	Range / default
Volume	Clip level	0–2, default 1
Routing	**Channel bed (multichannel / immersive bed)** or **Object (3D positioned)**	Bed
Object X (L–R), **Object Y (B–F)**, **Object Z (height)**	Object position	X –1 to 1 (0), Y –1 to 1 (1), Z 0–1
Object size	Spreads the object over more speakers	0–1, default 0
Motion	**Static** or **Orbit**	Static
Orbit rate (Hz), **Orbit radius**, **Orbit height**	Orbit movement	rate 0–2 (0.1), radius 0–1.5 (1)

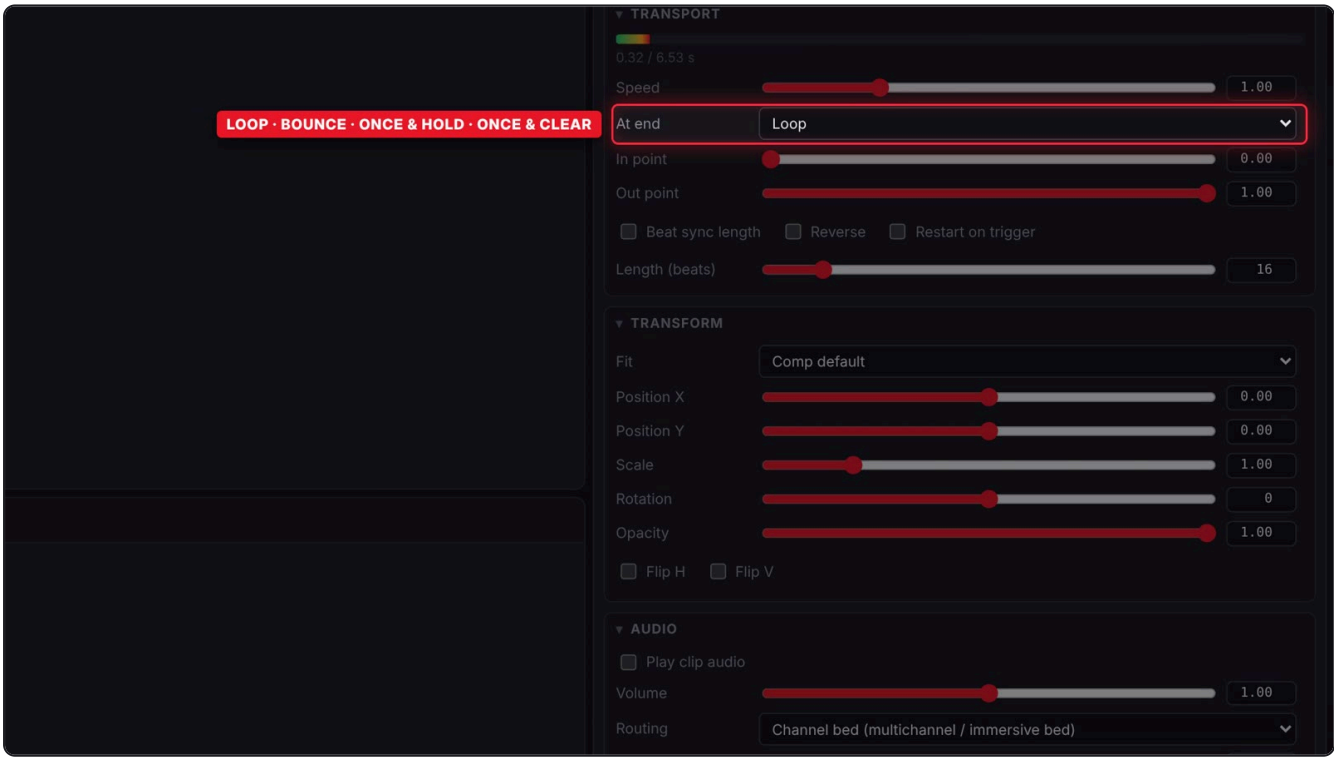


Figure 6. Clip transport: Loop, Bounce, Play once & hold and Play once & clear

Layer settings: transitions and autopilot

Select a layer header to see the layer settings.

Control	What it does	Range / default
Opacity, **Audio level (gain)**, **Blend mode**	Same as the layer strip	—
Transition → Type	How a new clip replaces the old one	**Cut**, **Fade**, **Dissolve**, **Wipe Left**, **Wipe Up**, **Iris**, **Zoom**, **Blur Fade**, **Slide**, **Glitch** (default Fade)
Duration (s)	Transition time	0–10 s, default 0.5
or beats	Transition time in beats instead	0–32
Autopilot → Mode	Plays clips automatically	**Off**, **Next clip**, **Random clip**
Advance	When autopilot moves on	**When clip ends**, **Every N beats**
Beats	N for **Every N beats**	1–128, default 16

Layer effects are listed below these settings (see the next chapter).

Composition settings

Click the **Layers / Columns** corner of the deck to open the composition settings.

Control	What it does	Range / default
Resolution	Composition size, from 1280 × 720 to 15360 × 2160, or **custom**	1920 × 1080
Background	Background colour	Black
Default fit	**Fit**, **Fill**, **Stretch** or **Native**	Fit
Master	Master opacity (also in the top bar)	0–1
Column trigger clears empty layers	See above	Off
Auto BPM from audio	Follows the tempo of the audio analysis	Off

The section also shows the GPU, its maximum texture size and whether the pipeline is **16-bit float** or **8-bit**.

> **Note:** Above 8K (7680 × 4320) the composition switches to 8-bit buffers automatically so that 12K canvases fit in GPU memory. A resolution larger than the GPU's maximum texture size is refused. 12K needs a GPU with 16384-pixel textures.

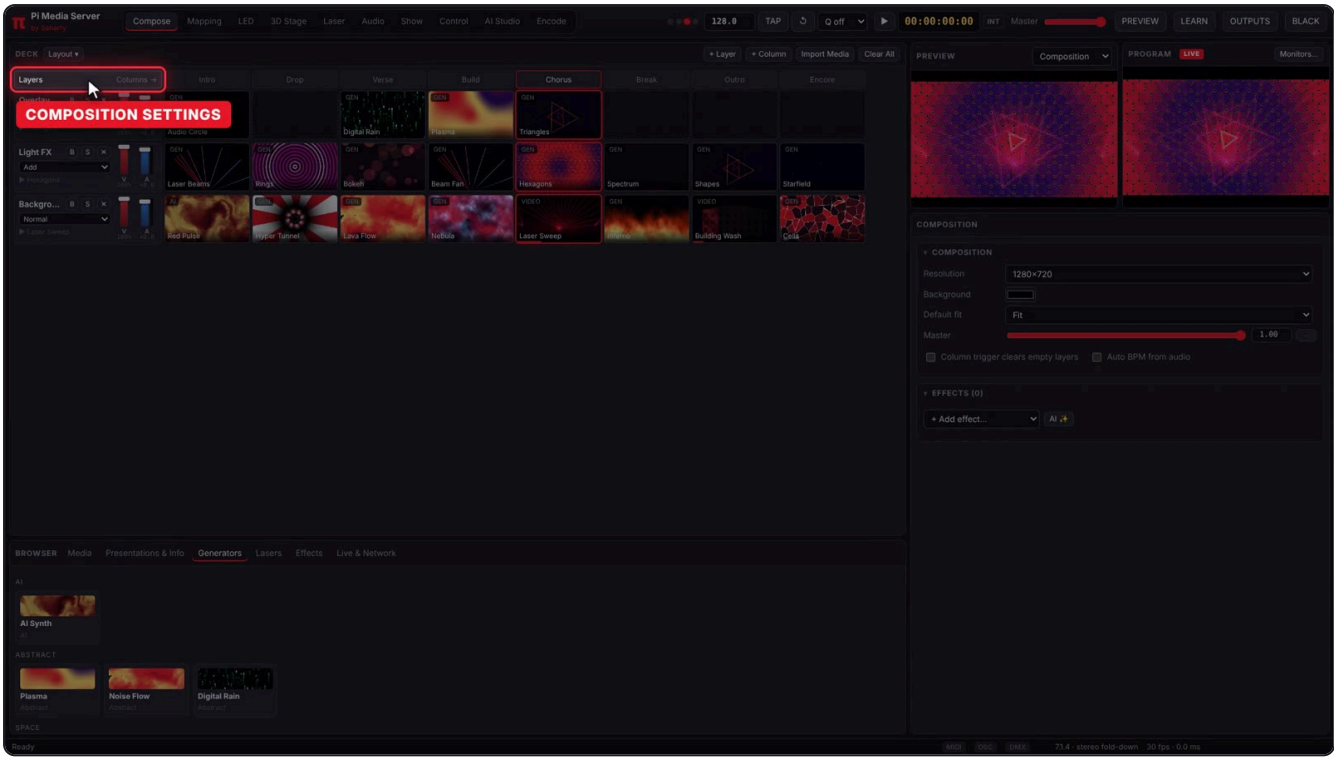


Figure 7. Composition settings

Preview and TAKE

Press **PREVIEW** (Cmd/Ctrl+P). Compose now edits a copy of the show: you can trigger clips and change effects without touching the live outputs, and a small **PROGRAM** monitor keeps showing what is live. When the look is ready, press **TAKE** (Cmd/Ctrl+Enter). The look goes live using each layer's transition.

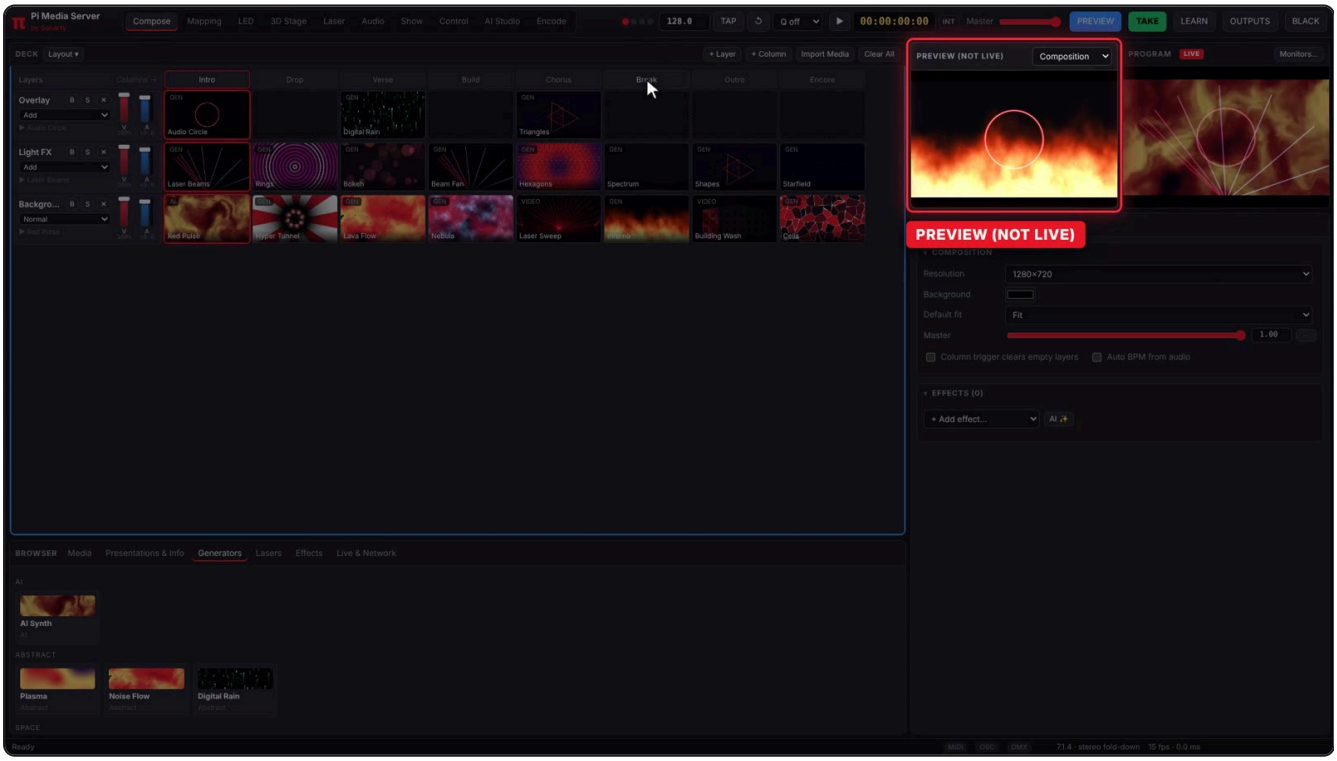


Figure 8. Building a look in PREVIEW and sending it live with TAKE ▶ **Animated in the online manual**

Tempo and quantise

Set the BPM by typing it, tapping **TAP** (or **T**), following MIDI clock (Control workspace), or turning on **Auto BPM from audio**. Choose **Q beat** or **Q bar** to make clip and column triggers land on the next beat or bar.

EFFECTS, GENERATORS AND MODULATION

Generators

Open **Browser** → **Generators** and drag a generator onto a cell. There are 24: **AI Synth**, **Plasma**, **Noise Flow**, **Tunnel**, **Starfield**, **Nebula**, **Rings**, **Stripes / Bars**, **Retro Grid**, **Checkerboard**, **Cells**, **Hexagons**, **Fire**, **Water Caustics**, **Aurora**, **Laser Beams**, **Bokeh Lights**, **Audio Spectrum**, **Audio Circle**, **Digital Rain**, **Gradient**, **Solid Color**, **Test Card** and **Geometric Shapes**.

Generator clips have their own parameters plus **Time speed** (0–4) and **Render res** (**Full resolution**, **Half resolution (faster)**, **Quarter resolution**).

AI Synth combines 16 pattern engines with warp, symmetry, palette, pulse and audio response.

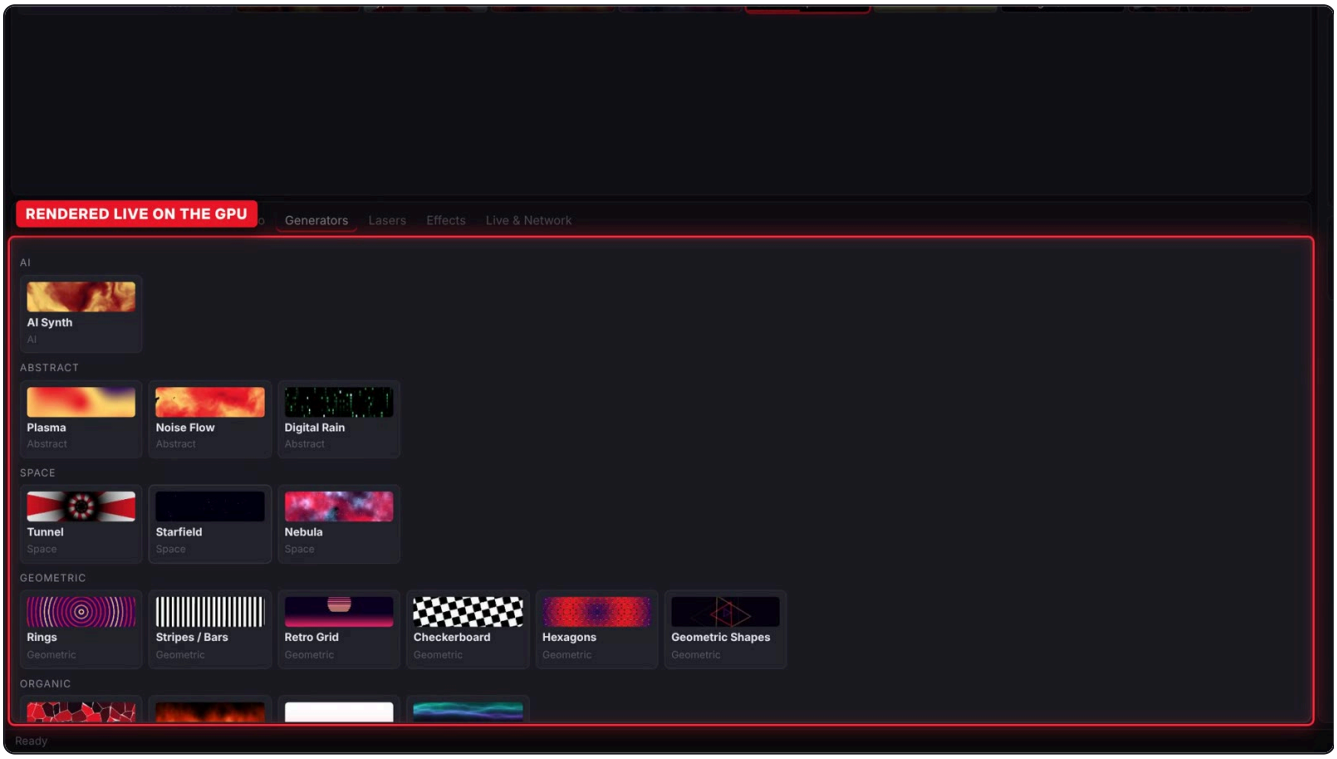


Figure 9. The Generators tab in the browser

Effects

There are 51 GPU effects in eight groups:

Group	Effects
Color	Brightness / Contrast, Hue Rotate, Levels / Gamma, Colorize, Duotone, Gradient Map, Invert, Threshold, Posterize, RGB Gain, Fade To Color
Blur	Blur, Glow / Bloom, Zoom Blur, Directional Blur, Sharpen
Distort	Wave, Twirl, Bulge / Pinch, Fisheye, Polar Coordinates, Noise Displace, Liquid

Group	Effects
Geometry	Transform, Mirror, Kaleidoscope, Tile, Scroll / Shift, Crop, Shape Mask
Stylize	Pixelate, LED Dot Matrix, Halftone, Edge Detect, Emboss, Scanlines / CRT, VHS, Film Grain, Vignette, Dot Code
Glitch	RGB Split, Glitch Blocks, Data Smear
Time	Feedback / Trails, Strobe, Beat Flash, Beat Zoom, Shake, Audio Pulse
Key	Chroma Key, Luma Key

To add an effect:

1. Open **Browser** → **Effects**.
2. Drag the effect onto a **clip** (clip effect), a **layer header** (layer effect) or the **Preview** monitor (composition effect).
3. Select the clip, layer or composition to adjust the effect in the inspector. Every effect has a **Mix** control (0–1) and can be reordered.

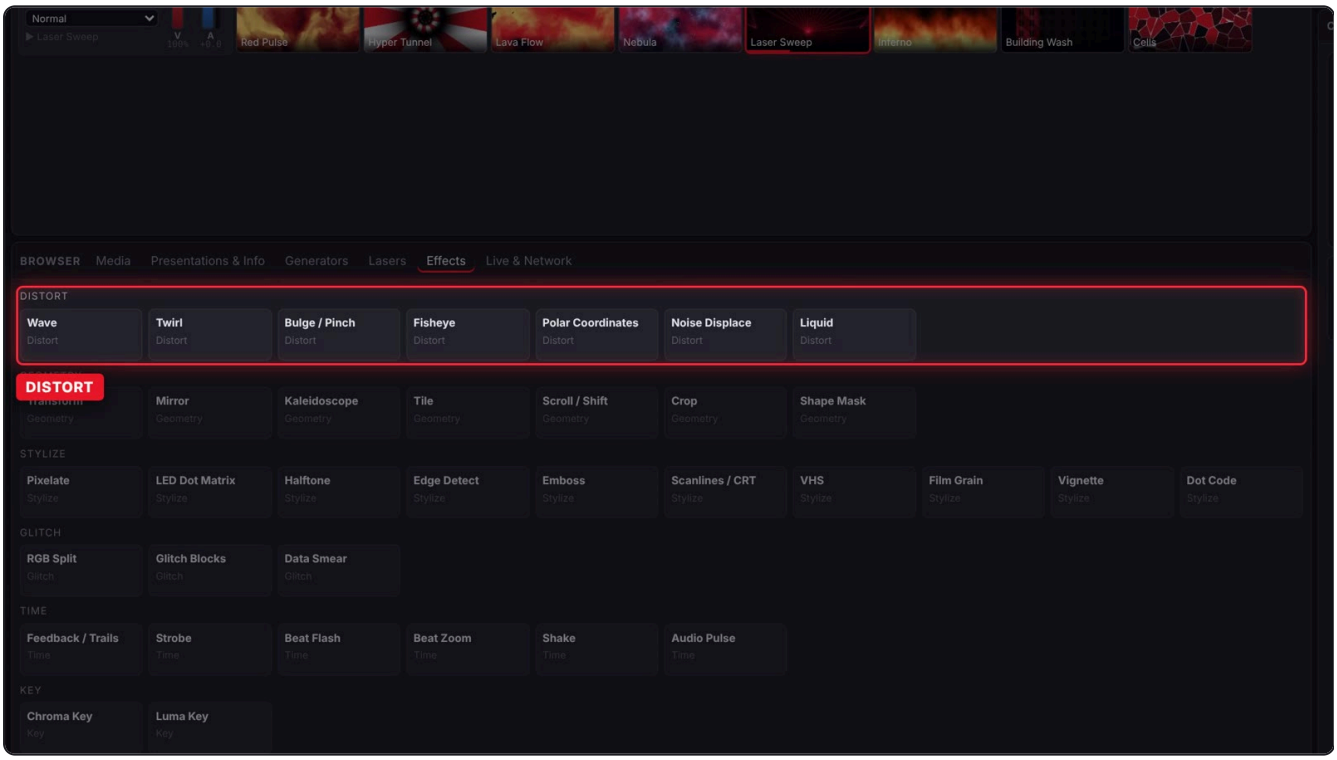


Figure 10. The Effects tab, grouped by category

Modulation

Most sliders have a small **~** button. Click it to cycle **None** → **LFO** → **Audio** → **Beat**. Right-click it for the settings:

Setting	Applies to	Range
Depth	All	0–1

Setting	Applies to	Range
Beats / cycle	LFO, Beat	0.25–64
Shape	LFO	sine, tri, saw, square, random
Bipolar	LFO	On / off
Band	Audio	bass, mid, high, level
Decay	Beat	1–20

The button shows **LFO**, **AUD** or **BT** when modulation is on. Audio modulation follows the analysis set up in the **Audio** workspace.

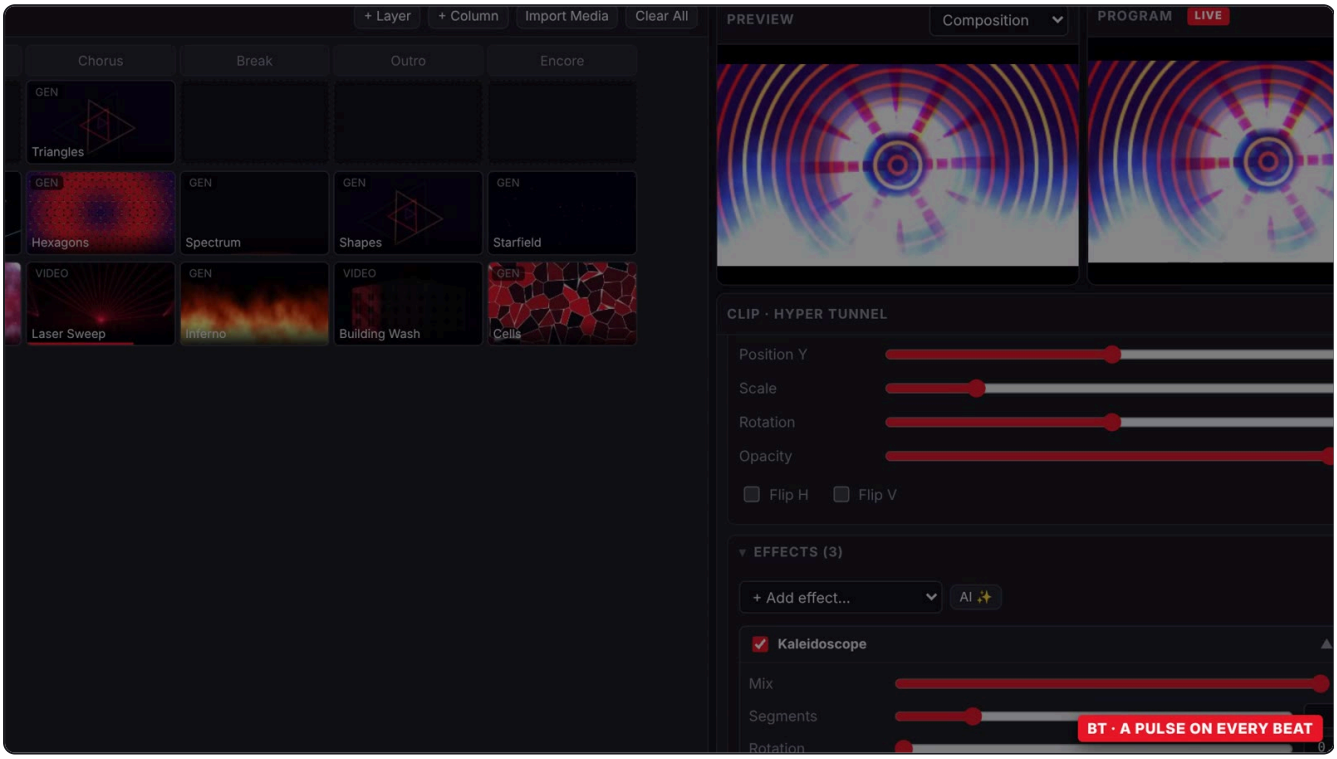


Figure 11. An effect parameter pulsing on every beat with Beat modulation ▶ Animated in the online manual

> **Tip:** Double-click any slider to reset it to its default.

Text and tickers

Drag **Text** from the Generators tab, or right-click a cell and choose **New Text Clip**. Settings: text, **Size** (10–600), **Color**, **Align**, **Weight**, **Font**, **Vertical** position, **Outline** (0–30), **Outline color** and **Ticker speed** (0–5) for scrolling tickers.

Presentations, playlists and info clips

The **Presentations & Info** tab of the browser holds:

- **Import PowerPoint / Keynote / PDF**: each slide becomes part of one slide clip, with speaker notes. On Windows, `.pptx` import uses the Microsoft PowerPoint installed on the computer; on a Mac it uses Keynote, or PowerPoint if Keynote is not available. PDFs import on any computer. Embedded videos and animations become still slides. Options include **Skip hidden slides** and **Restart at slide 1 on trigger**.
- **Image Folder as Slides**: every image in a folder becomes a slide.
- **Playlist**: videos and images in sequence, with **Image duration (s)** (1–120), **Crossfade (s)**, **Transition**, **Shuffle** and **Loop playlist**.
- **Info clips**: **Clock** (time zones, 24-hour, date), **Countdown** (to a duration of 5–7200 s or to a date and time, with **Warn at (s)**, **Warning colour**, **End text** and **Count negative after zero**), **Timer / Stopwatch**, and **Subtitles (SRT)** synced to **Clip time (from trigger)**, **Show timecode** or **Manual (line by line)**, with an **Offset (s)**.

Change slides with the arrow keys, PageUp / PageDown, a presentation clicker, OSC `/pims/slides/next`, TCP `SLIDE NEXT`, or the **Presenter View** window (Cmd/Ctrl+Shift+P), which shows the current slide, the next slide, notes, a clock and an elapsed timer.

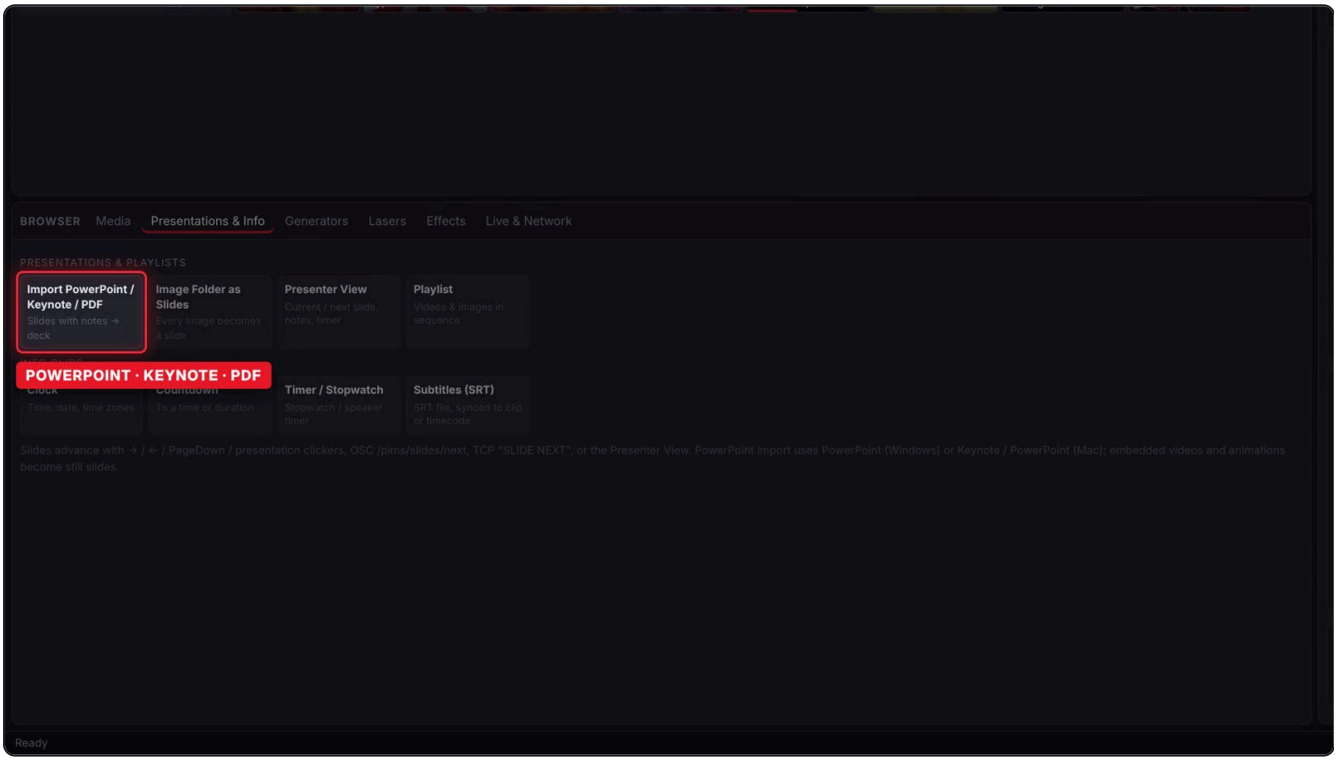


Figure 12. Importing PowerPoint, Keynote or PDF slides

Live and network sources

The **Live & Network** tab lists cameras and capture cards, **Screen / window capture**, **NDI source** and **Network Stream**. Network streams accept RTSP, RTMP, SRT, HLS, UDP and HTTP URLs. Options include **RTSP over UDP**, **Low-bandwidth (proxy) stream** and **RTMP: listen for a push**, which lets OBS push to `rtmp://this-ip:1935/live/key`.

> **Note:** Network stream inputs carry video only. Route their audio through your sound interface.

Finger Paint clips

Drag **Finger Paint** onto a cell to draw live visuals. Draw in the paint pad with a mouse, pen or touch screen (several fingers paint at once), click **Full-screen Pad**, or open the web remote's paint page on phones and tablets (see *Control*).

Control	Range / default
Brush	**Neon glow**, **Pen**, **Soft marker**, **Spray**, **Ribbon**, **Sparkles**, **Eraser**
Brush size	0.002–0.15, default 0.02
Colour, **Rainbow ink**	—
Glow	0–2, default 0.6
Opacity	0.05–1, default 1
Symmetry	**None**, **Mirror left / right**, **Mirror top / bottom**, **Four-way**, **Kaleidoscope 6**, **Kaleidoscope 8**
Fade after (s, 0 = keep)	0–30, default 0
Background	**Transparent (over lower layers)**, **Black**, **White**

Undo and **Clear** work on the painting. **Keep in Show** stores the current painting in the show file.

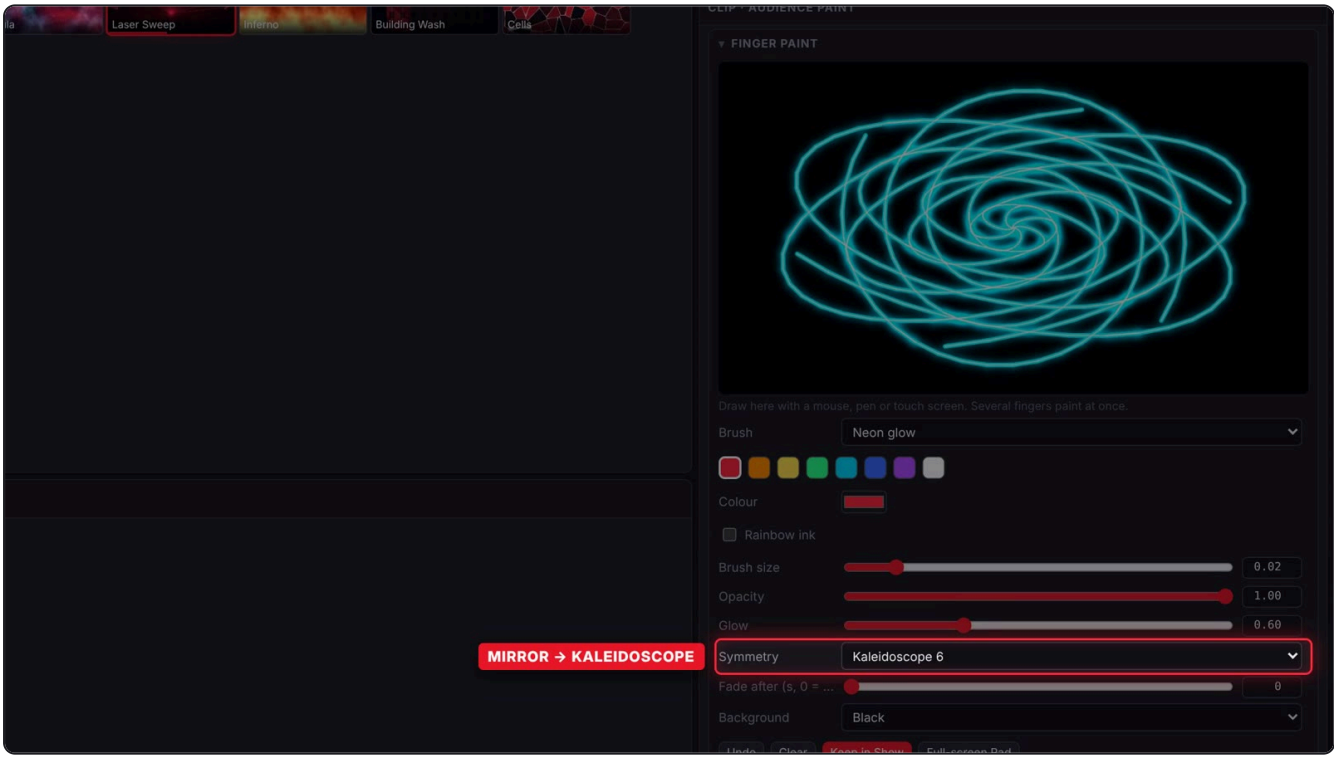


Figure 13. Finger Paint with Kaleidoscope symmetry ▶ Animated in the online manual

PROJECTION MAPPING

The **Mapping** workspace has three columns: **Outputs** (left), the **Input — composition** and **Output** canvases (centre), and **Properties** (right).

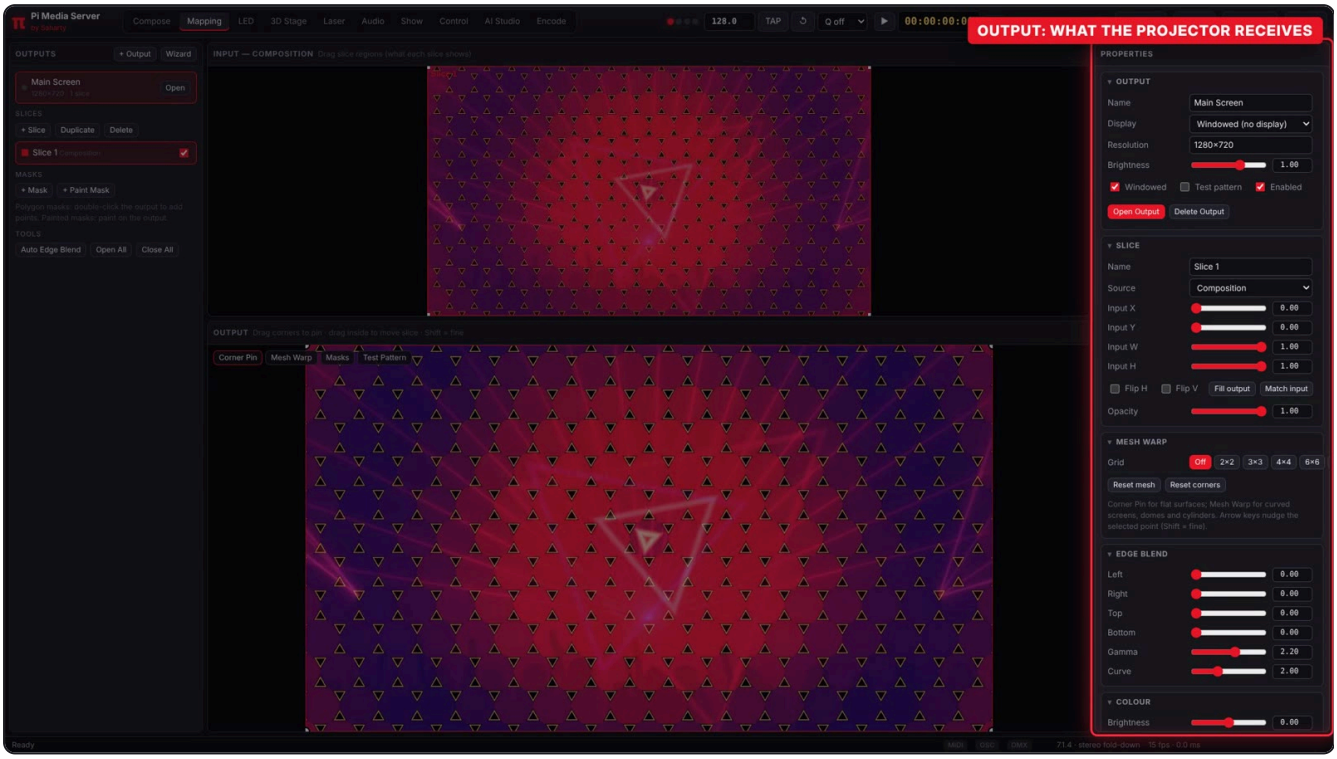


Figure 14. The Mapping workspace: outputs list, input and output canvases, properties

Outputs

An output is one physical display (projector, LED processor input, screen) or a window.

1. Click **+ Output**.
2. In **Properties → Output**, choose the **Display**. The output takes that display's resolution. Choose **Windowed (no display)** to show it in a window instead.
3. Click **Open Output**. **Open All** / **Close All**, the **OUTPUTS** button and **Output → Open All Outputs** (Cmd/Ctrl+Shift+O) work on every output.

Control	What it does	Range / default
Name	Output name	Output 1
Display	Target display	—
Resolution	Output size (type `width x height`)	Display size
Brightness	Output brightness	0–1.5, default 1
Windowed	Window instead of full screen	Off

Control	What it does	Range / default
Test pattern	Shows a test pattern with slice labels	Off
Enabled	Output on / off	On

Slices

Each output contains one or more slices. A slice takes part of a source and places it on the output.

1. Click **+ Slice** (or **Duplicate** an existing one).
2. Choose its **Source**: **Composition**, any **Layer**, or a **3D Projector** view from the 3D Stage.
3. Drag the slice region in the **Input** canvas, or set **Input X / Y / W / H** (0–1).
4. Use **Fill output** to stretch it over the whole output, or **Match input** to place it pixel-for-pixel where it sits in the composition.

Each slice also has **Flip H**, **Flip V** and **Opacity**.

Corner pin and mesh warp

Choose **Corner Pin** above the output canvas for flat surfaces. Drag the four corners onto the surface, drag inside the slice to move it, and hold Shift for fine moves. The arrow keys nudge the selected point (Shift = finer).

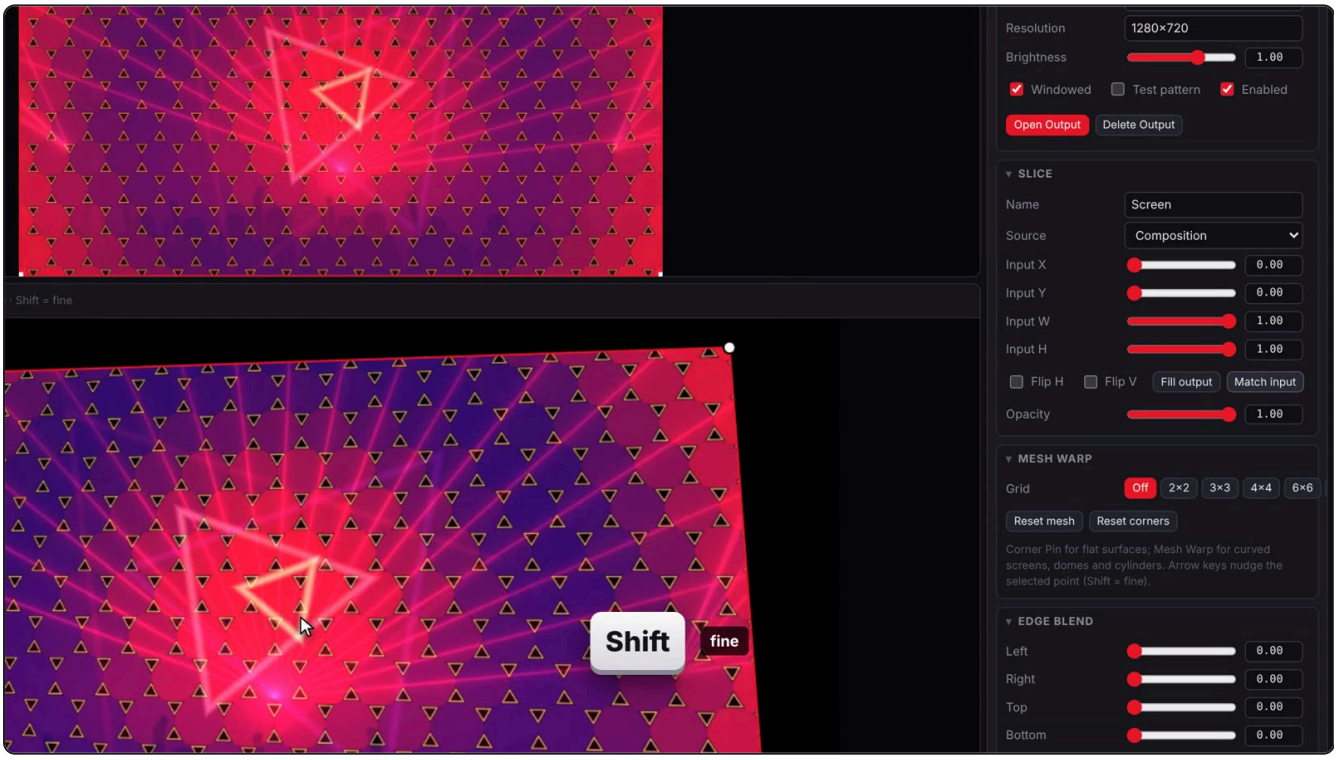


Figure 15. Corner pinning a slice, with Shift for fine adjustment ▶ Animated in the online manual

For curved screens, domes and cylinders, choose a **Mesh Warp** grid of **2×2**, **3×3**, **4×4**, **6×6**, **8×8**, **12×12** or **16×16**. Drag the mesh points; the surface between them bends smoothly (bicubic). **Reset mesh** and **Reset corners** start again; **Off** returns to corner pin.

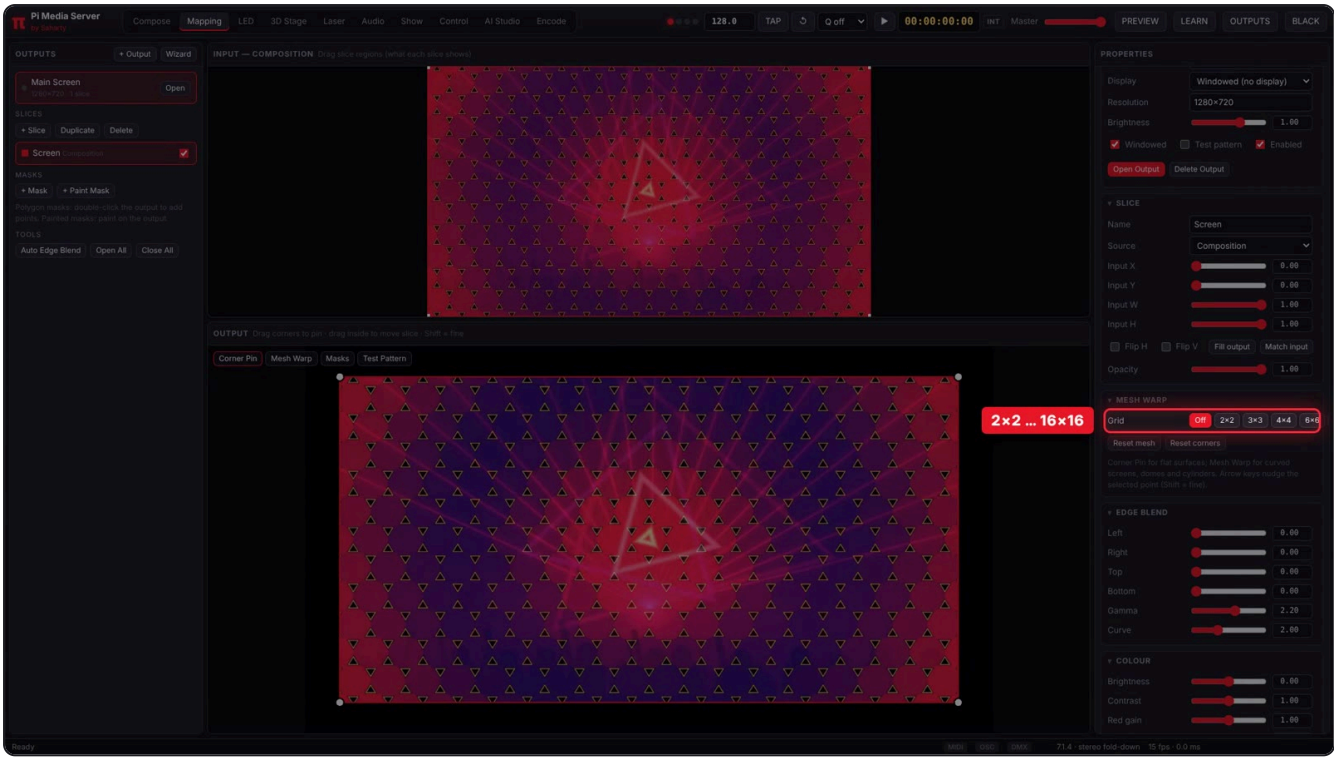


Figure 16. Mesh Warp grid sizes from 2×2 to 16×16

Masks

- **+ Mask** adds a polygon mask. Double-click the output to add points, double-click an edge to insert one, Alt+click to delete one.
- **+ Paint Mask** adds a painted mask. Paint straight onto the output with a mouse, pen (pressure sets the width) or touch screen, hold Alt to erase, or click **Paint Pad…** for a large pad or paint from a phone.

Mask settings: **Feather** (0–1), **Invert (show inside only)** and **Enabled**. Painted masks also have **Brush size** (0.005–0.25) and **Eraser**.

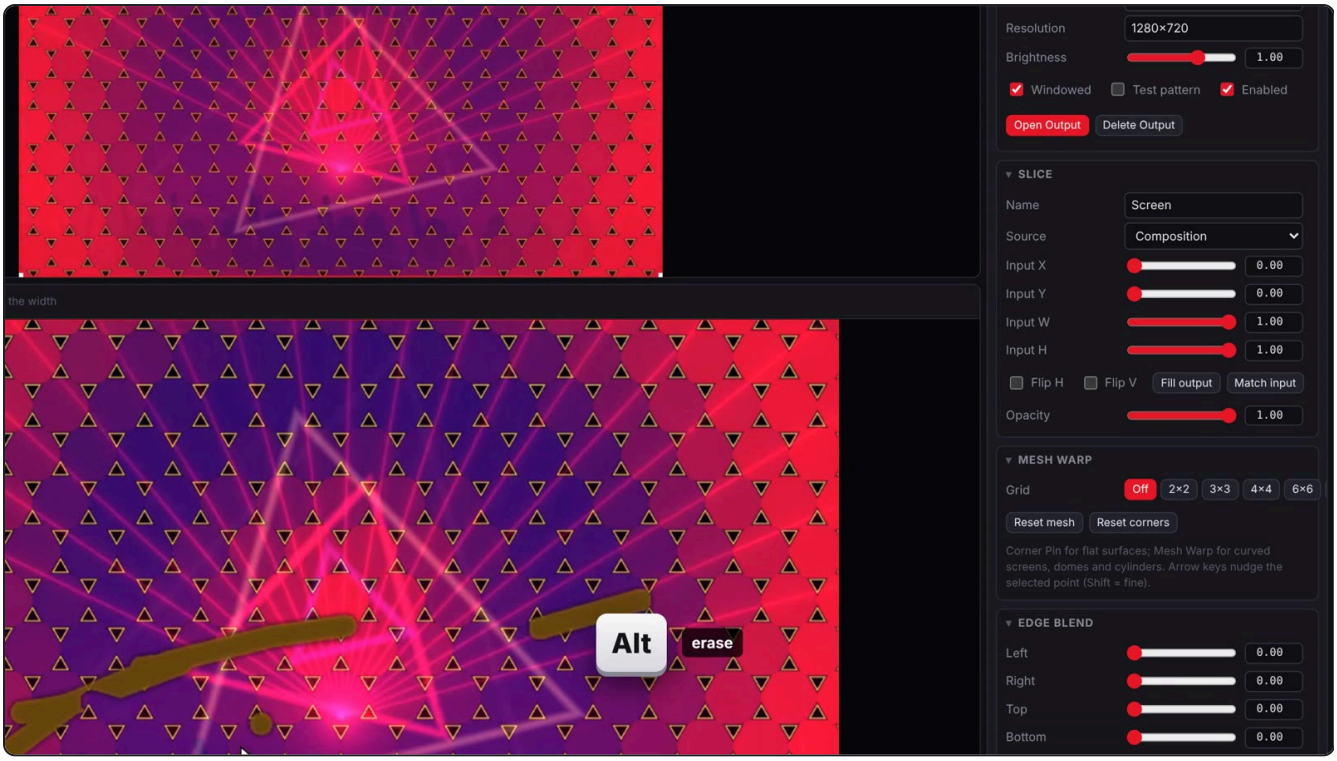


Figure 17. Painting a mask straight onto the output ▶ Animated in the online manual

Edge blending

For overlapping projectors, each slice has an **Edge Blend** section: **Left**, **Right**, **Top** and **Bottom** blend widths (0–0.5), **Gamma** (1–3, default 2.2) and **Curve** (1–4, default 2).

- **Auto Edge Blend** works out the blend zones from slices whose inputs overlap.
- **Wizard** (Projector array / blend wizard) builds an N × M blended setup in one step: **Projectors across** (1–8), **Projectors down** (1–4), **Overlap** (0–0.4, default 0.15), **Projector width** / **height** and **Replace existing outputs**.

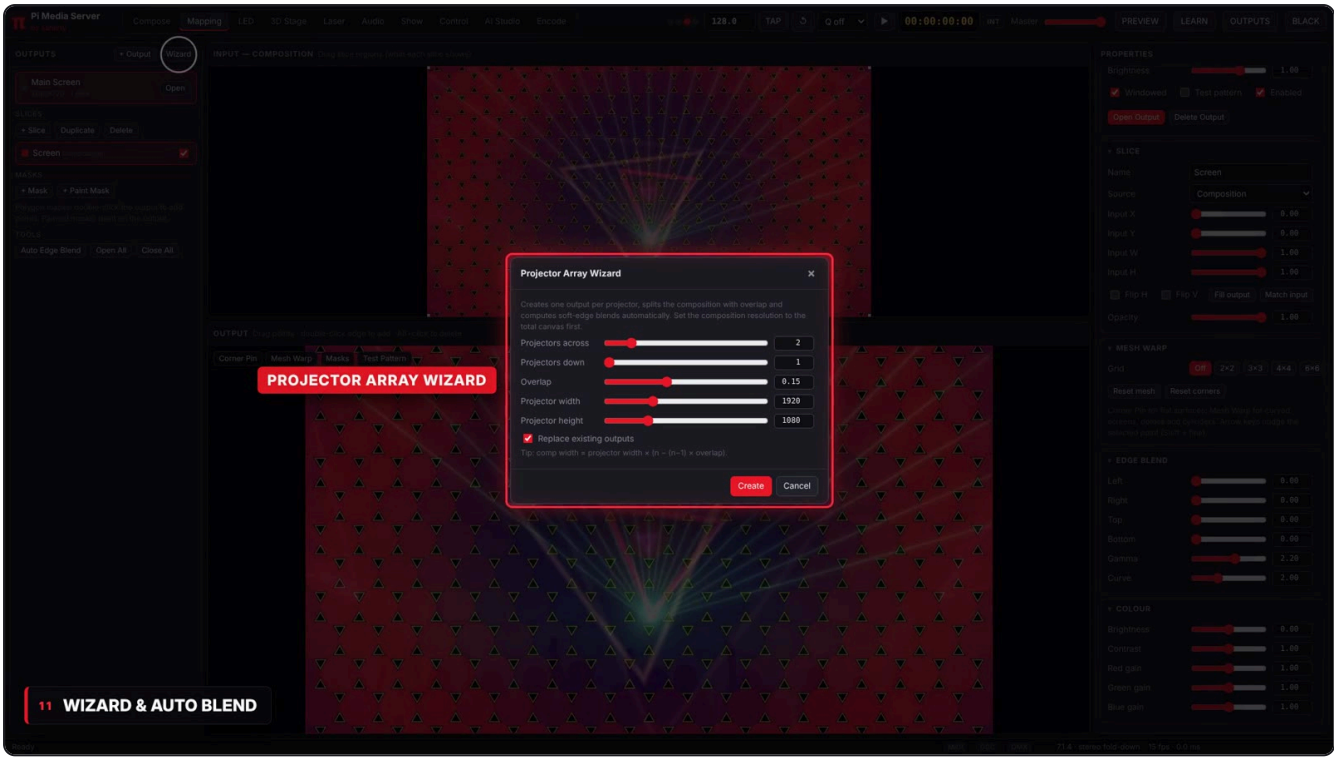


Figure 18. The Projector Array Wizard

Colour matching

Each slice has a **Colour** section to match projectors or panels: **Brightness** (–1 to 1), **Contrast** (0–2) and **Red / Green / Blue gain** (0–2).

> **Tip:** Turn on **Test Pattern** (or **Output → Test Pattern**, Cmd/Ctrl+T) while you pin and blend. Slice labels make it easy to see which projector shows what.

3D STAGE

The **3D Stage** shows your venue in 3D. You can map content onto models, plan projectors with real lenses and send each projector's view to an output.

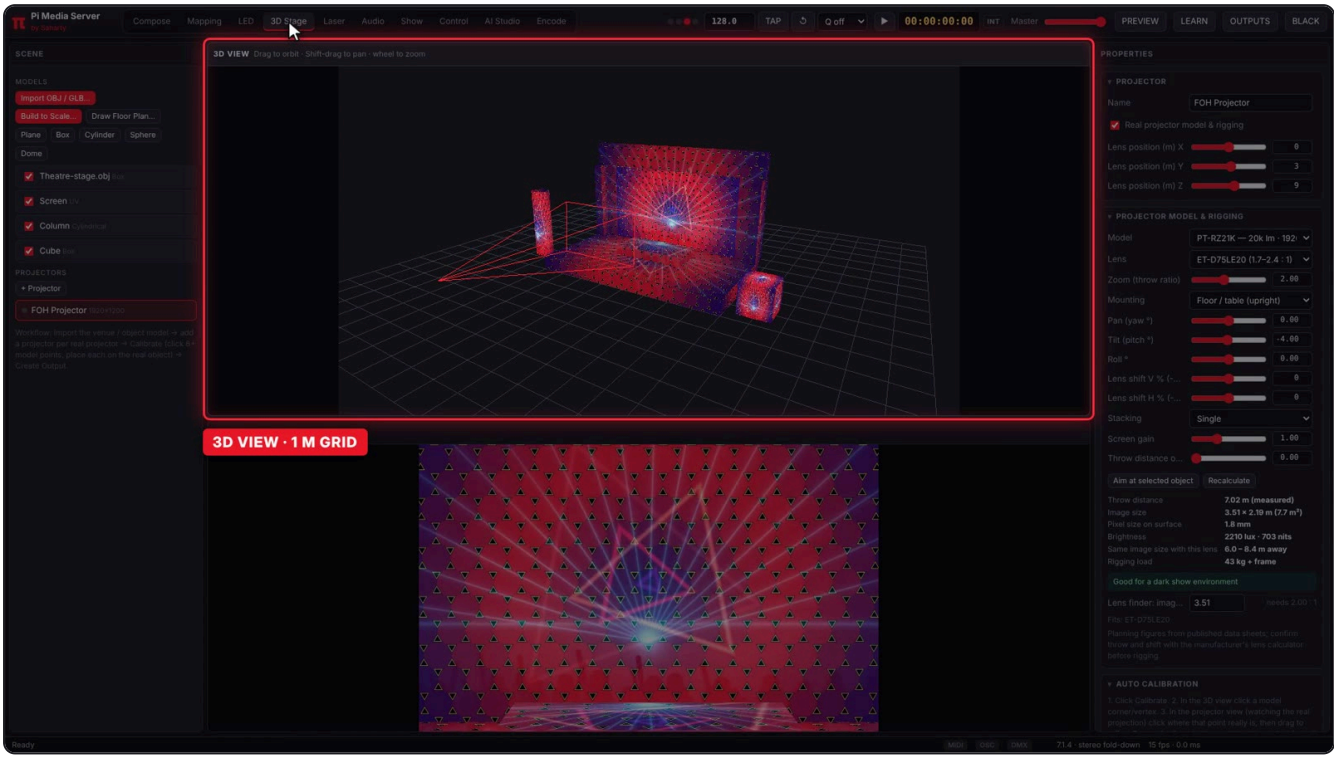


Figure 19. The 3D view and the Projector View

Models

- **Import OBJ / GLB...** imports OBJ, glTF or GLB models. A model is scaled to about 2 units and placed on the floor; give it its real size in **Real size (metres)**.
- **Build to Scale...** creates objects in metres: **Projection screen / flat surface**, **Wall / box / riser**, **Cylinder / column**, **Sphere**, **Dome (hemisphere)**, **Cone** and **Truss bar (0.29 m box)**.
- **Draw Floor Plan...** lets you draw any outline in plan view (snapping to 10 cm, with live edge lengths) and extrude it.
- Any object can be resized to its real width, height or depth (**Keep proportions**), set with **Sit on floor** or **Centre**.

Navigate the 3D view by dragging to orbit, Shift-dragging to pan and using the wheel to zoom.

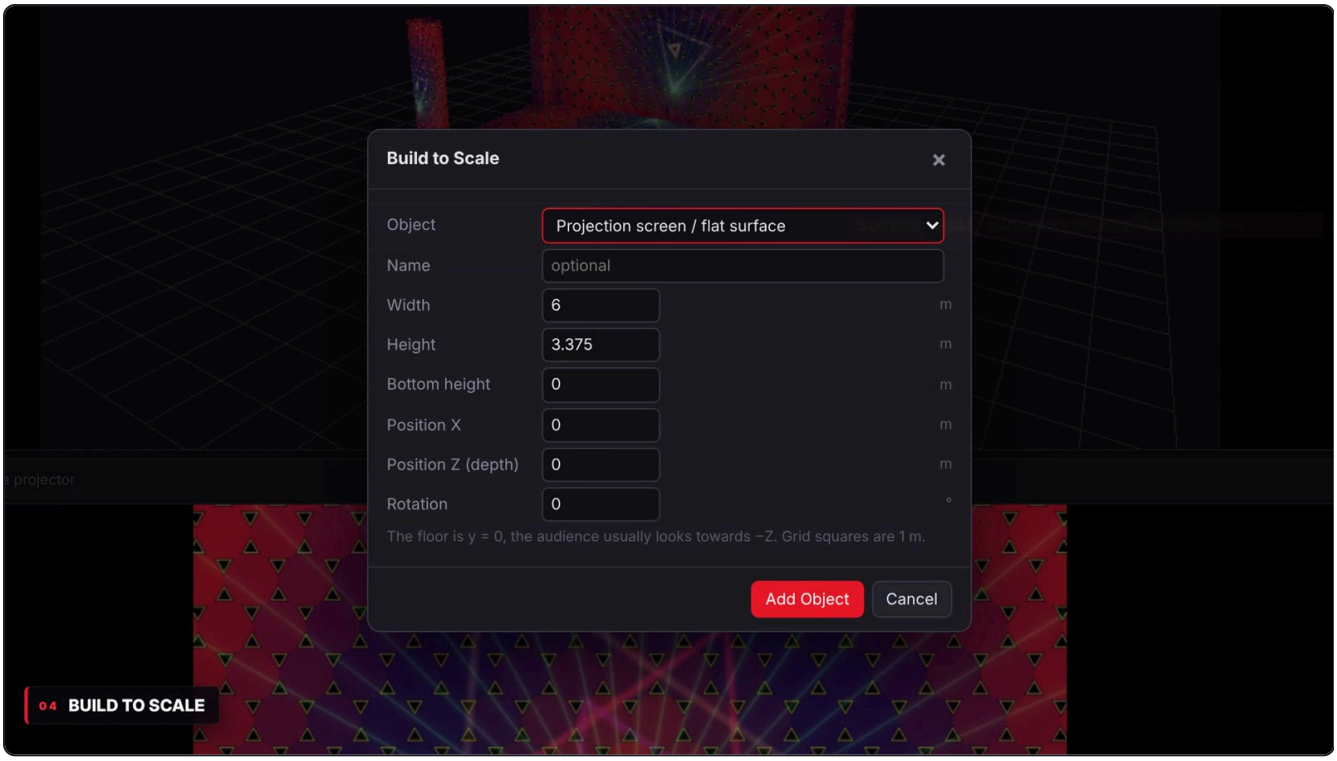


Figure 20. Build to Scale: objects in real metres

Mapping content onto models

Select a model and set **Content** (the composition or any layer), **Content X / Y / W / H** and **Texture mapping**: **UV**, **Planar**, **Box**, **Cylindrical**, **Spherical** or **Solid**.

Projectors and rigging

Click **+ Projector**. Each virtual projector has a position, aim (**Aim at selected object**), **Vertical FOV**, **Lens shift H / V** and a **Resolution**.

Under **Real projector model & rigging**, pick a real model (Panasonic, Barco, Christie, Epson, Sony, Sharp NEC or **Custom**) and a **Lens**, then set:

Control	Range / default
Zoom (throw ratio)	Limits of the chosen lens
Mounting	**Floor / table (upright)**, **Ceiling (inverted)**, **Truss hang (inverted)**, **Portrait (rotated 90°)**
Pan (yaw °)	−180 to 180
Tilt (pitch °)	−90 to 90
Roll °	−45 to 45
Stacking	**Single**, **Double stack**, **Triple stack**, **Quad stack**
Screen gain	0.3–2.5, default 1
Throw distance override (m)	0–120, 0 = measured

The panel reports the **Throw distance** (measured to the first object), **Image size**, **Pixel size on surface**, **Brightness** in lux and nits with a verdict, the distance range for the same image size, the **Rigging load**, and a **Lens finder** for a wanted image width.

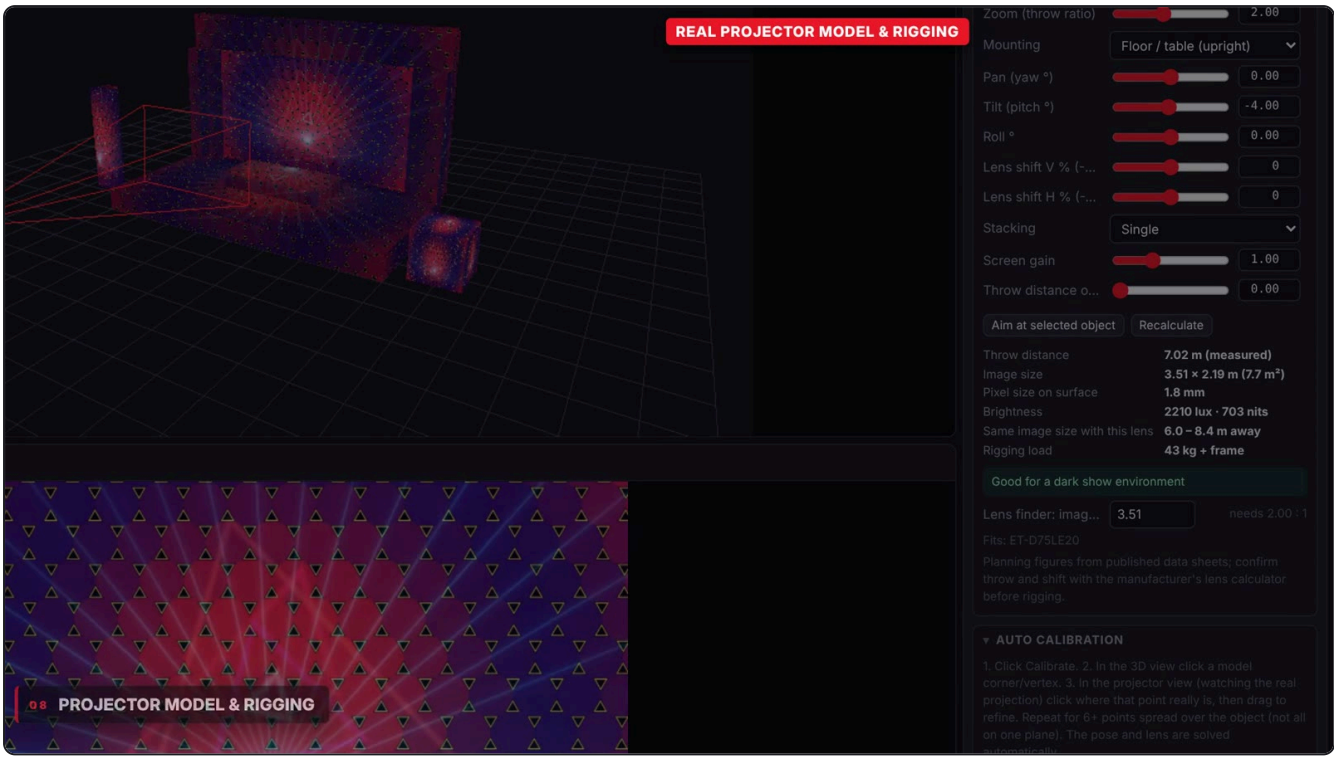


Figure 21. Projector model and rigging

> **Note:** These are planning figures from published data sheets. Confirm throw and shift with the manufacturer's lens calculator before rigging.

Projector view and outputs

Select a projector to see its **Projector View**. Click **Create Output for Projector** to send that view to a new output, or choose **3D Projector: name** as a slice source in Mapping.

Point-pair auto calibration

1. Select the projector and click **Calibrate**.
2. Click a point on the model in the 3D view (**Model point**).
3. Click where that point is on the real projection. Drag markers to refine.
4. Repeat for at least 6 points. The projector's pose and lens are solved automatically and the error in pixels is shown.
5. **Use solved pose** applies the result. **Clear Points** starts again; **Finish Calibrating** ends the session.

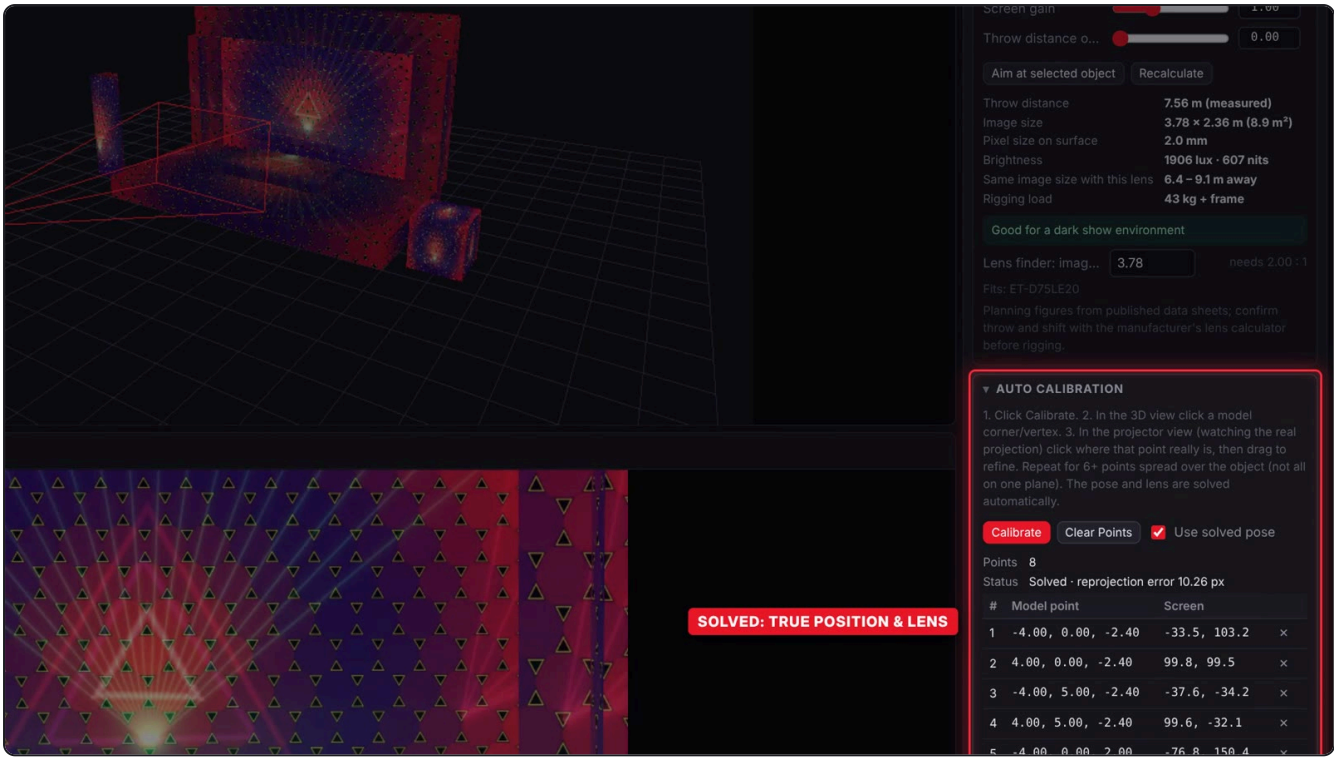


Figure 22. Point-pair calibration: pick a model point, then place it on the projection ▶ **Animated in the online manual**

LED WALLS AND PIXEL MAPPING

The **LED** workspace has **Fixtures** (left), the **Pixel Map** with a **DMX Monitor** (centre) and **Properties** (right).

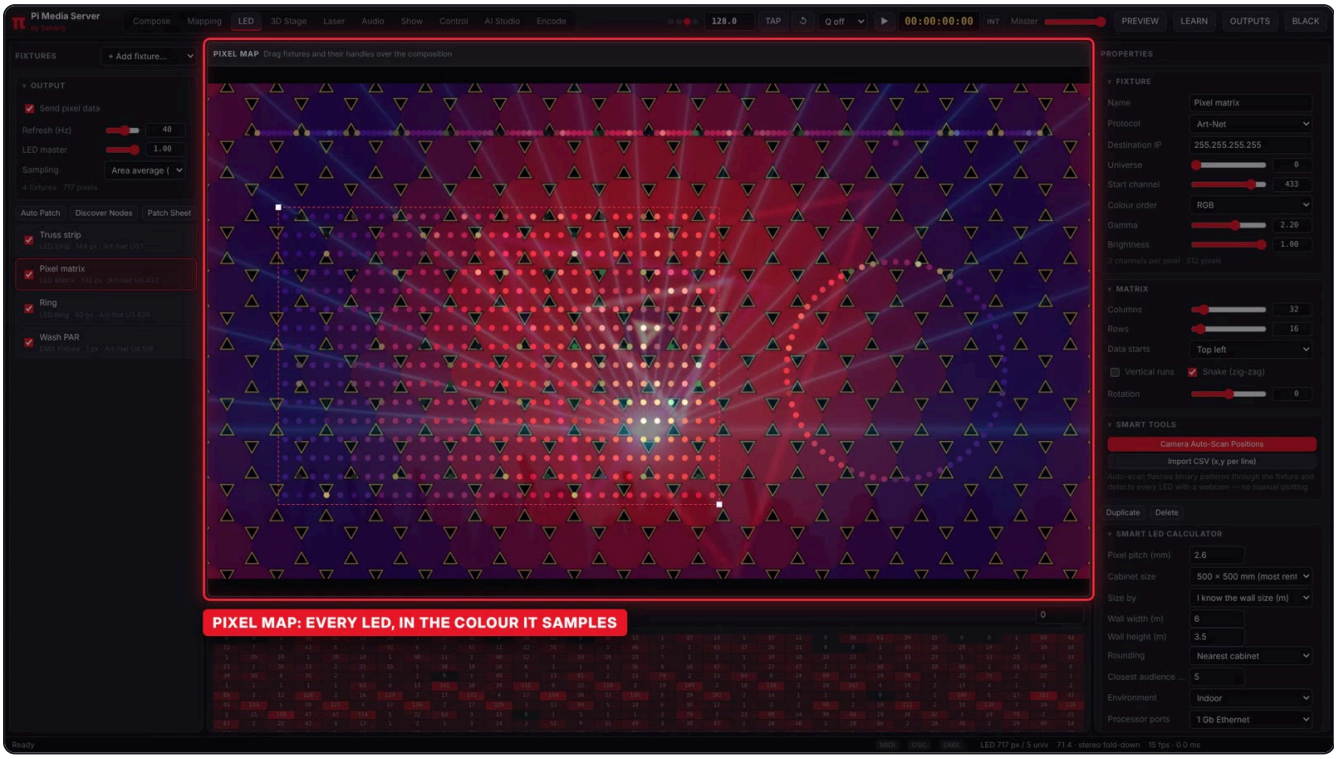


Figure 23. The Pixel Map: every LED shows the colour it samples

Pixel-mapped fixtures

1. Choose **+ Add fixture…**: **LED Strip**, **LED Matrix**, **LED Ring**, **Custom / Scanned** or **DMX Fixture**.
2. Drag the fixture and its handles over the composition in the Pixel Map.
3. Set the output protocol and address in **Properties → Fixture**.

Control	What it does	Range / default
Protocol	**Art-Net**, **sACN (E1.31)**, **DDP (pixel controllers, WLED, Falcon…)**	Art-Net
DDP start pixel	First pixel for DDP	0–65535
Destination IP	Controller address, broadcast or multicast	—
Universe	Start universe	0–32767
Start channel	Start channel	1–512
Colour order	RGB, GRB, BRG, RBG, GBR, BGR, RGBW, GRBW, W, DRGB, RGBWAU	RGB
Gamma	Per-fixture gamma	1–3, default 2.2
Brightness	Per-fixture brightness	0–1, default 1

Type-specific settings: strips have **Pixels** (1–2048), **+ Point / – Point** and **Reverse**; matrices have **Columns** and **Rows** (1–256), **Snake (zig-zag)**, **Vertical runs** and **Data starts** (**Top left**, **Top right**, **Bottom left**, **Bottom right**); rings have **Pixels**, **Radius**, **Start angle** and **Clockwise**.

Patching and output

- **Auto Patch** assigns universes in sequence so a pixel never splits across two universes.
- **Patch Sheet** shows every fixture with its pixels, channels, start and end addresses, protocol and destination.
- **Discover Nodes** finds Art-Net nodes on the network.
- The **DMX Monitor** shows the live values of any universe.
- **Send pixel data** turns LED output on. **LED master** (0–1) sets the overall level, **Refresh (Hz)** (10–60, default 40) sets the send rate, and **Sampling** chooses **Point sampling**, **Area average (smooth)** or **Wide average**.

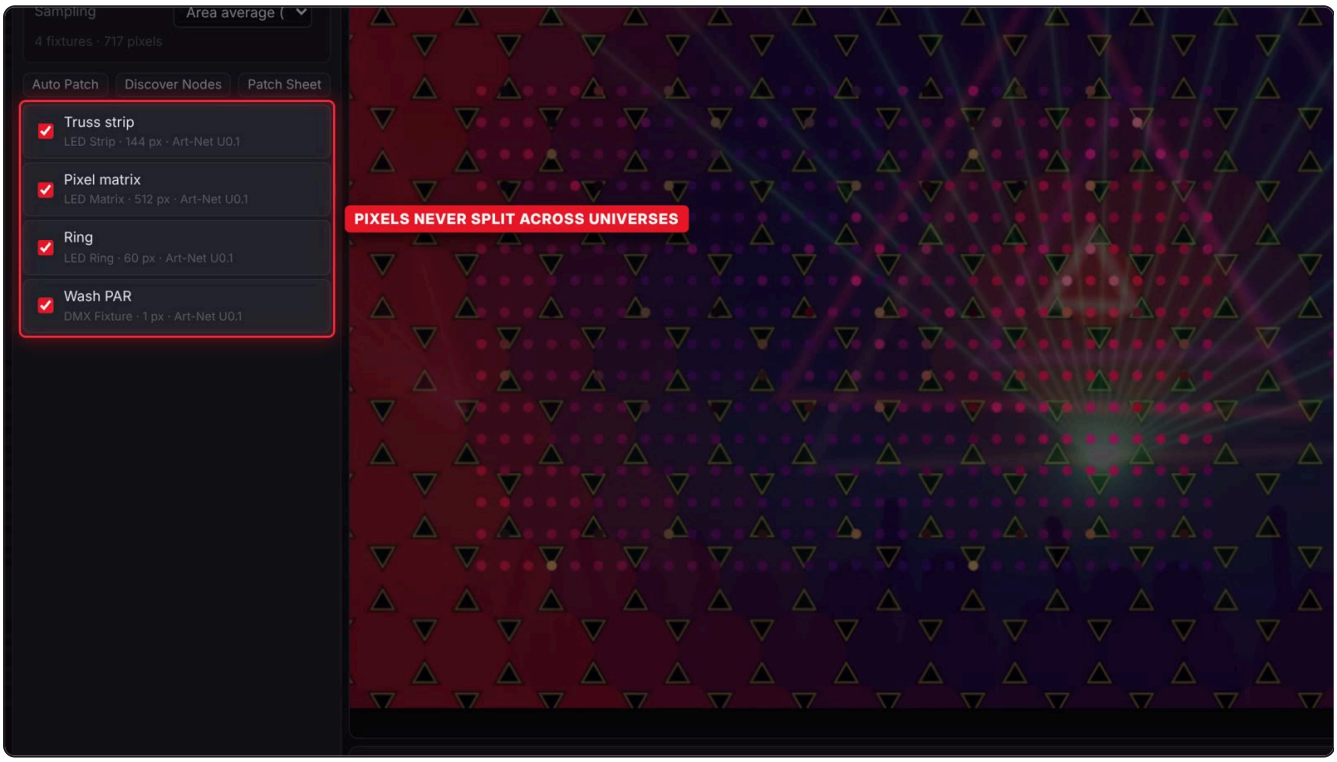


Figure 24. Auto-patched universes: a pixel never splits across two universes

Camera auto-scan

Camera Auto-Scan Positions finds the real position of every LED. Point a webcam at the whole fixture, darken the room, make sure LED output is enabled and patched, and click **Start Scan**. The app flashes binary patterns and builds the pixel positions from what the camera sees. You can also **Import CSV (x,y per line)**.

LED Wall Designer

Set **Cabinets across** (1–64) and **down** (1–32), **Cabinet px W / H** (16–1024), **Pixel pitch (mm)** (0.9–20), **Port capacity** (1G, 1G at high fps, 5G or 10G fibre), **Ports / processor** (1–40) and **Wiring** (**Snake by columns** or **Snake**

by rows). The designer reports the **Raster**, **Physical** size, **Cabinets / port**, **Ports** and **Processors**, and draws the wiring path.

- **Create LED Output** creates an output named "LED Wall" at the raster size. Assign it to the processor's display in Mapping.
- **Export Cabinet Map PNG** saves a cabinet map at the raster size.

Smart LED Calculator

Enter what you know and the calculator works out the rest.

Inputs: pixel pitch, cabinet size, the wall size in metres (with **Rounding** to the **Nearest cabinet**, **Fit inside the opening** or **Cover the opening**) or the cabinet count, **Closest audience (m)**, **Environment**, processor ports, frame rate (50–120 Hz), bit depth, cabinet power and weight, **Mains** voltage and **Shot on camera (broadcast / virtual production)**.

Results: real pitch, cabinet count, wall size, resolution and aspect ratio, minimum / seamless / retina viewing distances, ports, processors and receiving cards, power (kW, amps, 16 A circuits), weight and the best content canvas, with warnings when a size and pitch don't divide.

Buttons: **Apply to Wall Designer**, **Composition = native raster**, **Create LED Output** and **Add Test Card**.

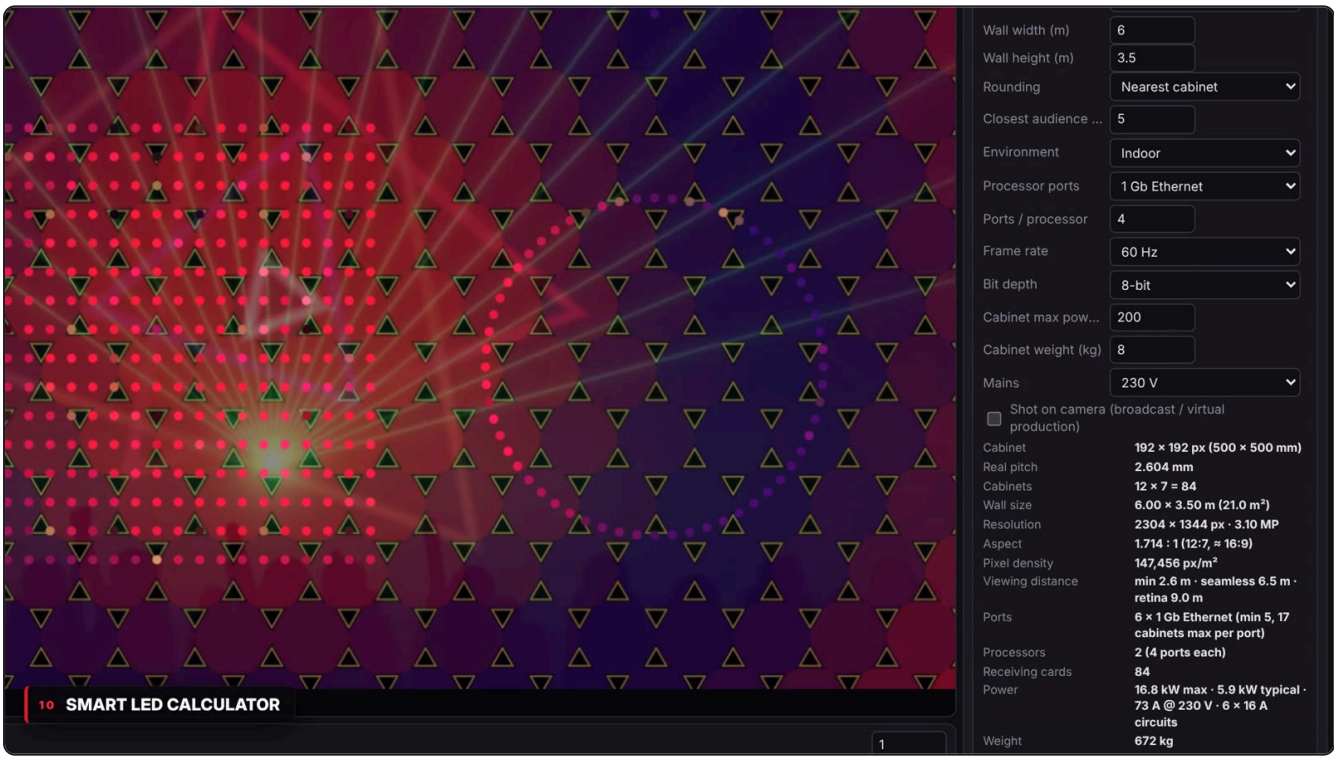


Figure 25. The Smart LED Calculator

Curved LED walls

Turn on **Curved wall** and choose:

- **Curve**: **Horizontal curve (bends left / right)** or **Vertical curve (bends top / bottom)**.

- **Cabinet locks**: **Generic ±10° (2.5° locks)**, **Generic ±5° (1° locks)**, ROE Black Pearl BP2V2, ROE Ruby-C, Unilumin Upad IV, Leyard / Planar LN, **Free angle (flexible / no detents)** or **Custom range…** (Min °, Max °, Lock step °).
- **Design by**: **Target radius**, **Total wrap angle**, **Fit an opening width (chord)**, **Maximum depth**, **Angle per joint** or **Custom joint list (S-curves)** (for example `5,5,5,0,-5,-5`; + is concave, – is convex).
- **Direction**: **Concave (ends toward audience)** or **Convex (bulges toward audience)**.

Angles snap to the cabinet's locks, with a warning when the target falls between locks or outside the cabinet's range. The panel shows the joint angles, radius, wrap, straight width (chord), depth, LED surface length, floor footprint and a plan view, plus a table of suggestions (cabinet count and lock angle) with a **Use** button.

- **Audience sweet spot**: **Across (m)**, **Eye height (m)** above the wall's bottom edge, and **Distance (m)** from the straight line between the wall's ends.
- **Add to 3D Stage** builds the wall at real size from the cabinet geometry.
- **Correct for Sweet Spot** warps the LED output so flat content looks straight from the sweet spot, scaling the picture down only as much as needed so nothing is cropped. Reset it in Mapping → Mesh Warp.
- **Build Sheet (CSV)** saves a joint-by-joint list for the crew.

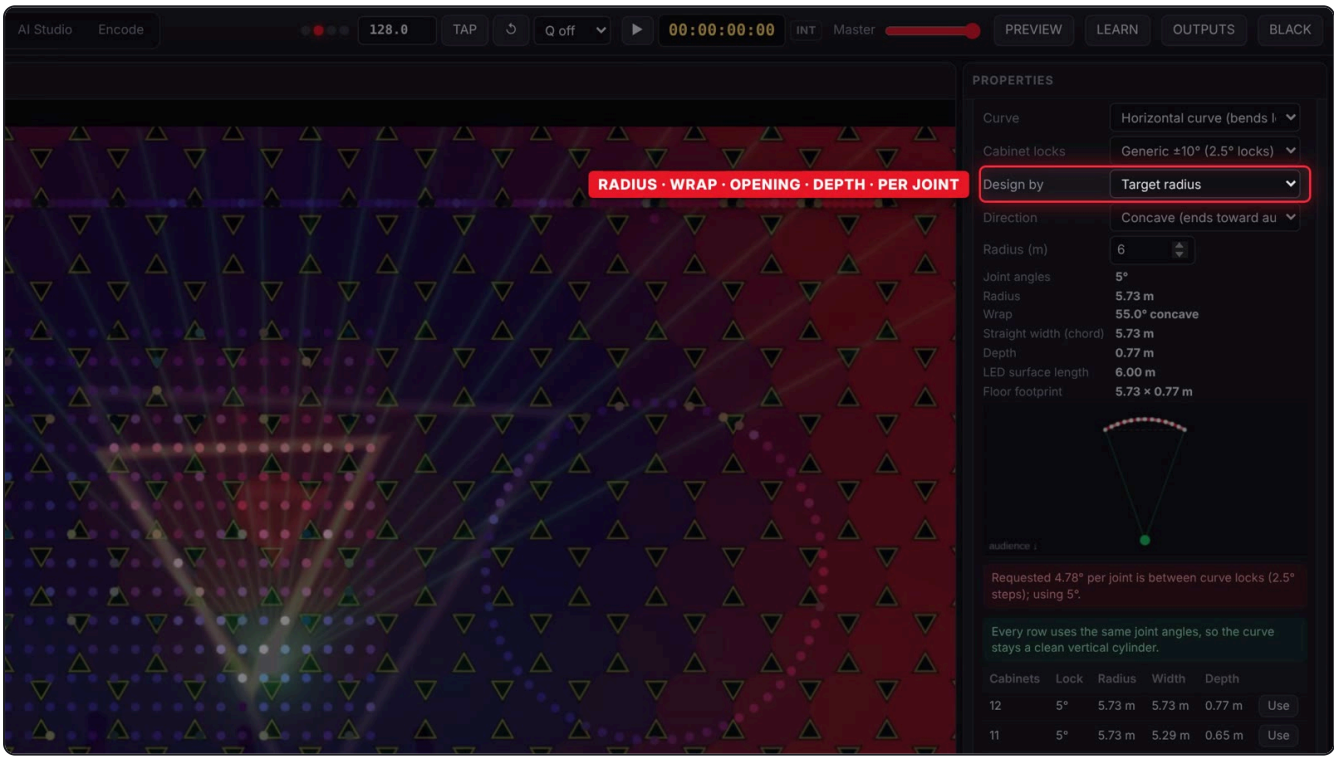


Figure 26. Curved wall design by radius, wrap, opening, depth or joint

> **Warning:** Curve-lock angles differ between cabinet models. Confirm the step and range on the cabinet data sheet before building.

LED PROCESSORS

The **LED Processors** section (LED workspace) connects to processors and drives them from the show.

Connecting

1. Click **Find on Network**. The app scans the local networks for NovaStar COEX, Megapixel HELIOS and Brompton Tessera processors.
2. Or add one by hand: choose the **Type** (**NovaStar COEX (MX / CX / VX Pro)**, **Megapixel HELIOS**, **Brompton Tessera** or **Other brand (custom commands)**) and enter the **IP address**. - NovaStar uses port 8001 (OpenAPI). If the processor has several screens, choose the **Screen**. - HELIOS needs an **API user** and **Password** if one is set. - Tessera: enter **Wall max (nits)** so brightness can be shown in nits.
3. Click **Connect**. The panel shows vendor, model, name, serial, firmware, cabinets and brightness.



Figure 27. Find on Network

Live control

Control	What it does
Brightness	0–1, sent live
Colour temp (K)	Colour temperature
Blackout / **Un-Blackout**	Blacks out the wall
Freeze / **Unfreeze**	Freezes the picture

Control	What it does
Test pattern	Off, Red, Green, Blue, White, Grid, Checkerboard, Horizontal lines / steps, Vertical lines / steps, Diagonal, Gradient / grey, Colour bars
Identify Cabinets	Shows cabinet IDs on the wall
Load Presets	Lists the processor's presets as buttons to recall
Load Inputs	Lists the inputs so you can switch with **Input**

An **All processors** row applies brightness, blackout and freeze to every processor at once. OSC: `/pims/ledproc/{n|all}/brightness f`, `/blackout i`, `/freeze i`, `/test s`, `/preset s` and `/cct f`.

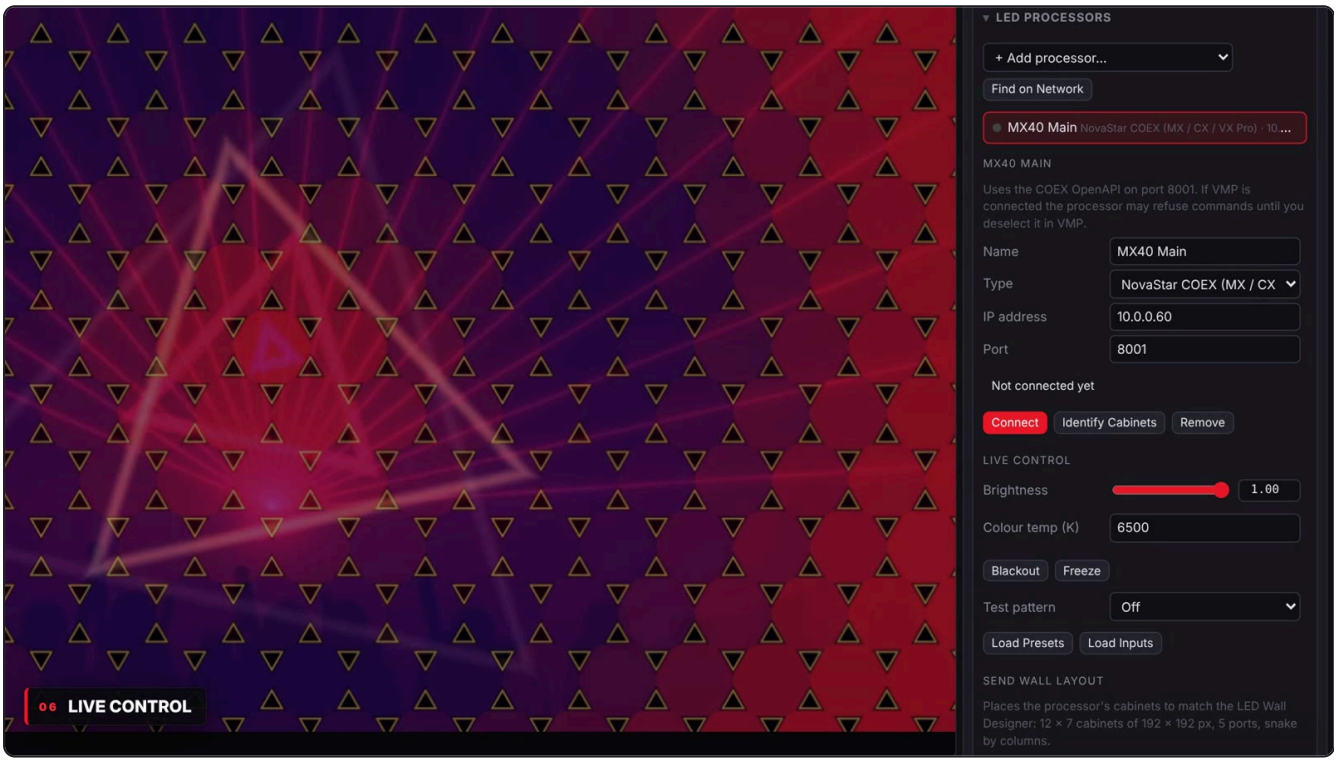


Figure 28. Live control: brightness, blackout, freeze and test patterns

Sending the wall layout

Send Layout... places the processor's cabinets (NovaStar) or tiles (HELIOS) to match the wall designer's grid, ports and wiring, with an optional **Canvas X / Y** offset. On NovaStar it repositions the cabinets of a screen that already exists; on HELIOS it sets each tile's position in output-port and chain order. Check the result in the processor's own software.

Tessera's IP control has no layout commands, so use the exports: **Cabinet CSV**, **Layout JSON** (including the curve) and the cabinet map PNG work with any processor software.

Other brands

For Colorlight, Linsn, Kystar, Absen, older NovaStar and others, choose **Other brand (custom commands)**. Set the **Protocol** (**TCP**, **UDP** or **HTTP (METHOD /path body)**), **Port**, **Brand / model** and **Preset count**, then enter the

commands from the maker's control protocol for **Brightness**, **Colour temperature**, **Blackout on/off**, **Freeze on/off**, **Test pattern on/off**, **Recall preset {value}** and **Select input {value}**.

Placeholders: `{pct}` 0–100, `{byte}` 0–255, `{value}` raw value, `{k}` kelvin. Start a command with `hex:` to send bytes, for example `hex:55 AA 01 {byte}`.

LASERS

The **Laser** workspace runs laser cues on tracks, previews them, and sends them to laser DACs or to external laser software.

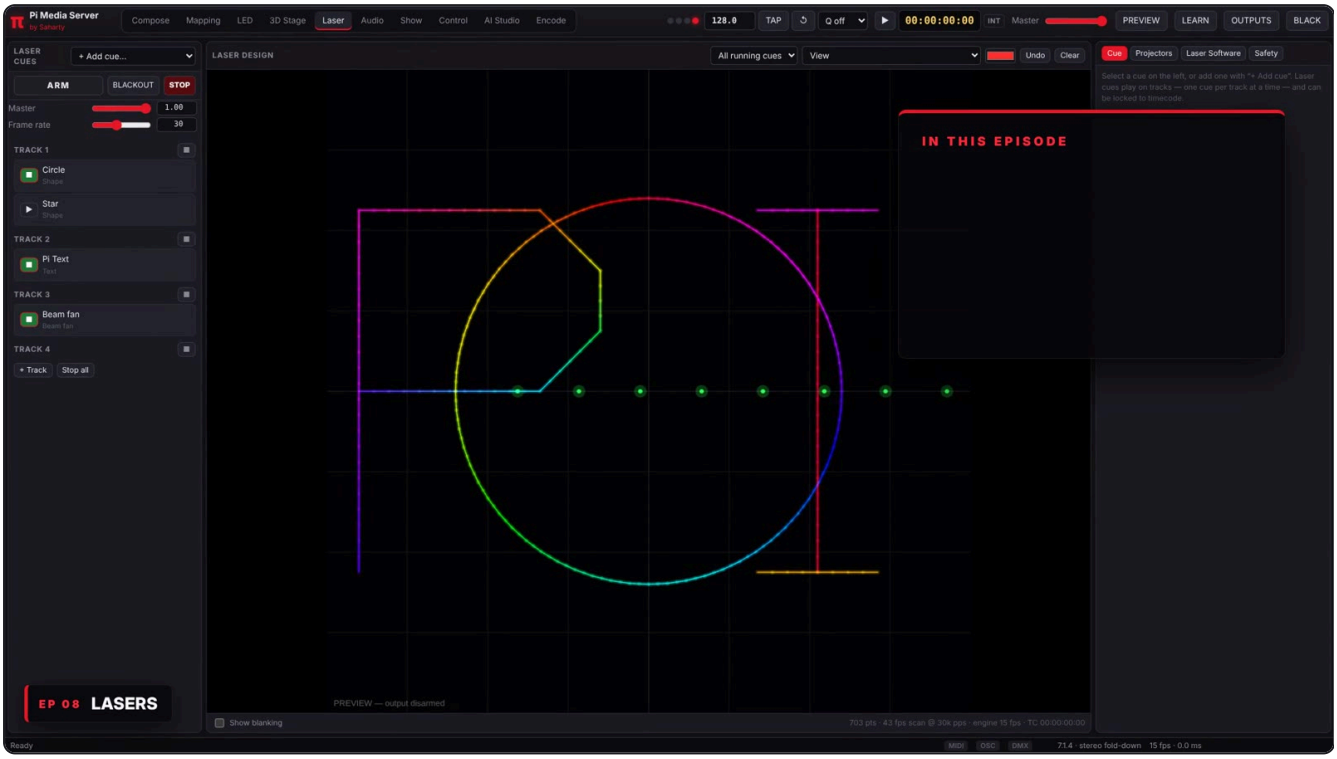


Figure 29. The Laser workspace

Laser cues

Cues sit on tracks like clips on layers: one cue per track plays at a time. Click **+ Track** to add a track. Cue types:

Shape (Circle, Square, Triangle, Polygon, Star, Line, Cross, Heart, Flower, Dot (beam)), **Text** (single-stroke laser font), **Beam fan**, **Tunnel**, **Wave lines**, **Spiral**, **Lissajous**, **Grid / lattice**, **Drawing**, **Auto trace (edges of media)**, **ILDA file** (formats 0, 1, 2, 4, 5) and **External trigger only**.

Each cue has **Transform** (**Size**, **Size X / Y**, **Position X / Y**, **Rotation (°)**, **Spin (°/s)**, **Mirror X**), **Colour** (**Solid**, **Gradient**, **Rainbow along path**, **Colour cycle**, **Change on beat**, **File / media colours**) and **Effects** (**Wave**, **Beat pulse**, **Audio size**, **Strobe (per beat)**, **Dashes**, **Draw-on rate**).

Drawing and auto trace

- Choose a drawing tool: **Pen (click points, double-click to finish)**, **Freehand**, **Line**, **Rectangle** or **Ellipse**. **Undo** and **Clear** edit the drawing.
- **Auto trace** draws the edges of the composition, a layer or an image live. **Detect** chooses **Edges (all detail)** or **Outline (shapes by brightness)**, with **Edge strength**, **Smoothing**, **Analysis width (px)** and **Trace rate (fps)**.

- **Freeze into a drawing cue** turns the current trace into an editable drawing. **Trace image…** traces a picture straight into a drawing cue.

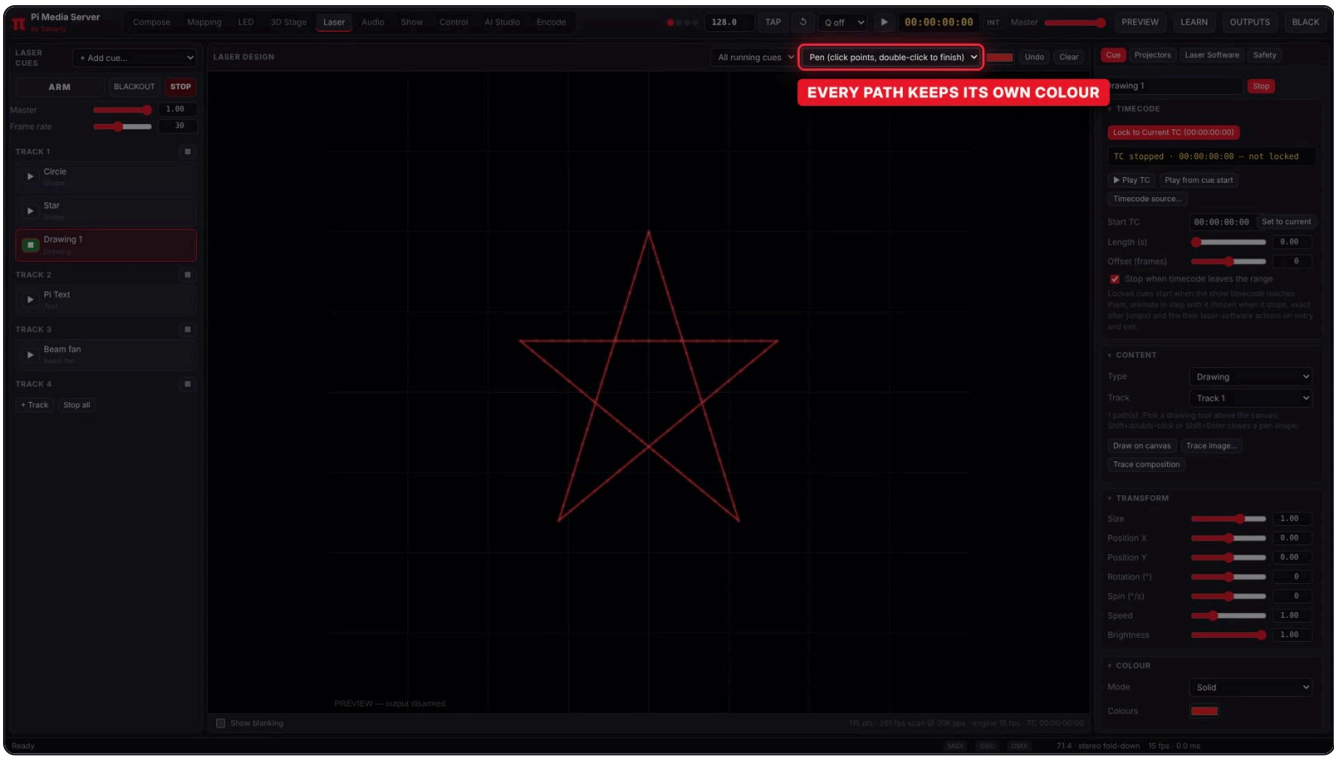


Figure 30. Drawing a laser path on the canvas ▶ Animated in the online manual

Timecode lock and export

Turn on timecode lock for a cue and set its **Start TC**, **Length (s)** and **Offset (frames)**. The cue triggers when the show timecode reaches its start, animates in step with the timecode (frozen when it stops, exact after jumps) and stops when the range ends (**Stop when timecode leaves the range**).

Export cue as ILDA… writes ILDA format 5 frames that most laser show software can load.

Laser projectors

On the **Projectors** tab, click **Find DACs** to search the network for Ether Dream, LaserCube and IDN devices, or add one with **+ Projector** and set the **Protocol** and **IP address** (and **IDN channel** for IDN).

Section	Controls
Scanner optimiser	**Scan rate (pps)** 5000–100000 (30000), **Point budget** 50–3000 (900), **Blank dwell** 0–30 (5), **Corner dwell** 0–20 (3), **Beam dwell** 4–200 (40), **Point density** 0.3–3 (1)
Geometry	**Size X / Y**, **Offset X / Y**, **Rotation (°)**, **Keystone H / V** (−0.5 to 0.5), **Invert X / Y**, **Swap X/Y**, **Scan limit** (0.1–1)
Colour & safety	**Red / Green / Blue** balance, **Diode threshold** (0–0.4), **Brightness**, **Static beam limit** (0–1, default 0.3), safety masks



Figure 31. The scanner optimiser

Safety

- Nothing leaves the DACs unless you arm the output: click **ARM** (it reads **ARMED** while armed). Every session starts disarmed.
- **STOP** or **Esc** is an emergency stop that stops output and disarms.
- **BLACKOUT** blacks out all laser output.
- **Safety masks**: choose **Safety mask (projector)** in the tool menu and drag over a projector's output to block an area (stage edges, balconies, cameras).
- **Static beam limit** caps brightness when content collapses into dots or beams.
- If frames stop arriving (crash, cable pulled), the drivers blank within 0.4 s.
- Remote arming over OSC, TCP, the web remote or sync is off unless you turn on **Allow arming the lasers remotely** on the **Safety** tab.

> **Warning:** Audience scanning needs the appropriate variance or permit and must stay below the maximum permissible exposure at every position. Use a hardware emergency stop and a qualified laser safety officer for public shows. LaserCube network firmware may keep scanning its last data on packet loss: use a wired connection and physical masking.

External laser software

On the **Laser Software** tab, add actions that fire when a cue starts or stops (**On start** / **On stop**):

- **+ OSC**: start / stop cues by name or page + cue, blackout and BPM sync in laser show software.
- **+ MIDI**: note, control change or program change to **Laser MIDI out**.

- **+ DMX**: Art-Net or sACN values for laser controllers and DMX lasers.

Under **Timecode to laser software**, send MTC to the Control tab's MIDI output, or generate LTC on an audio output channel, so the laser software chases the same timecode.

Lasers in the deck

Drag a cue from **Browser** → **Lasers** onto a cell. The clip draws the laser on screens and LED walls as glowing beams (**Beam width**, **Glow**, **Intensity**, **Render scale**, **Fit**) and, with **Fire the physical laser cue while this clip is live**, fires the real laser cue in sync. **All laser output** clips mirror exactly what the lasers draw.

IMMERSIVE AUDIO

The **Audio** workspace shows the **Speaker & Object View**, the **Analysis** panel and **Audio Setup**.

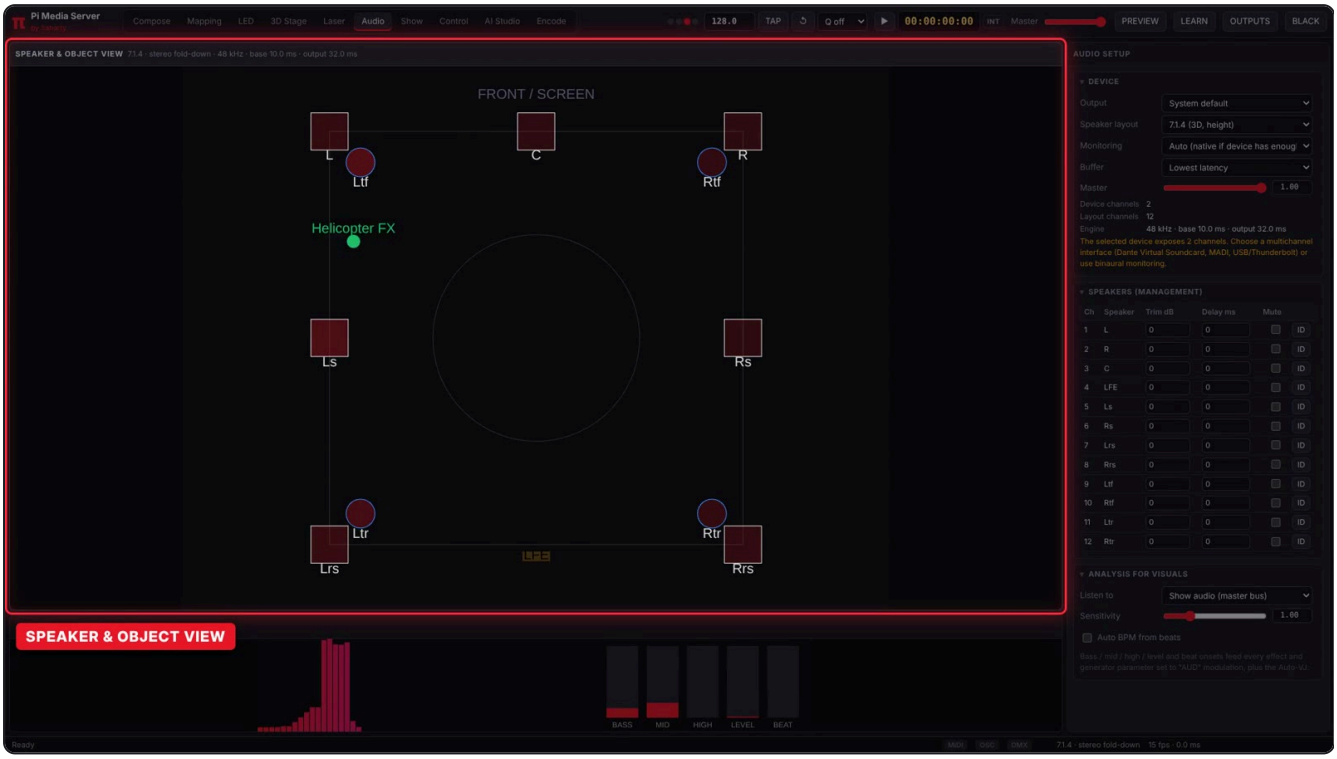


Figure 32. The Speaker & Object View: floor speakers as squares, height speakers as circles

Device and layout

Control	What it does	Options / default
Output	Audio device	System default
Speaker layout	1.0, 2.0, 2.1, 3.0, 4.0, 5.1, 7.1, 5.1.2, 5.1.4, 7.1.2, 7.1.4, 7.1.6, 9.1.4, 9.1.6	7.1.4
Monitoring	**Auto (native if device has enough channels)**, **Native multichannel**, **Binaural headphones (HRTF)**, **Stereo fold-down**	Auto
Buffer	**Lowest latency** or **Safe (larger buffer)** (applies after restart)	Lowest latency
Master	Audio master	0–1

The panel shows the device's channel count and the layout's channel count. If the device has fewer channels than the layout, choose a multichannel interface (Dante Virtual Soundcard, MADI, USB / Thunderbolt) or binaural monitoring.

Speaker management

The **Speakers (management)** table has, per speaker: **Trim dB** (−40 to +12), **Delay ms** (0–1000), **Mute** and **ID** (pink noise on that speaker for line checks).

Beds, objects and ADM masters

- Set a clip's **Routing** to **Channel bed** to send its channels to the matching speakers, or **Object (3D positioned)** to place it in the room with distance-based panning across floor and height layers. Objects appear as green dots in the view.
- **ADM BWF / BW64 / RF64** object-based masters play natively: beds go to their speakers and objects follow their own time-varying position metadata. Multichannel WAV files with more than 8 channels (16, 24 or 32-bit) also play.

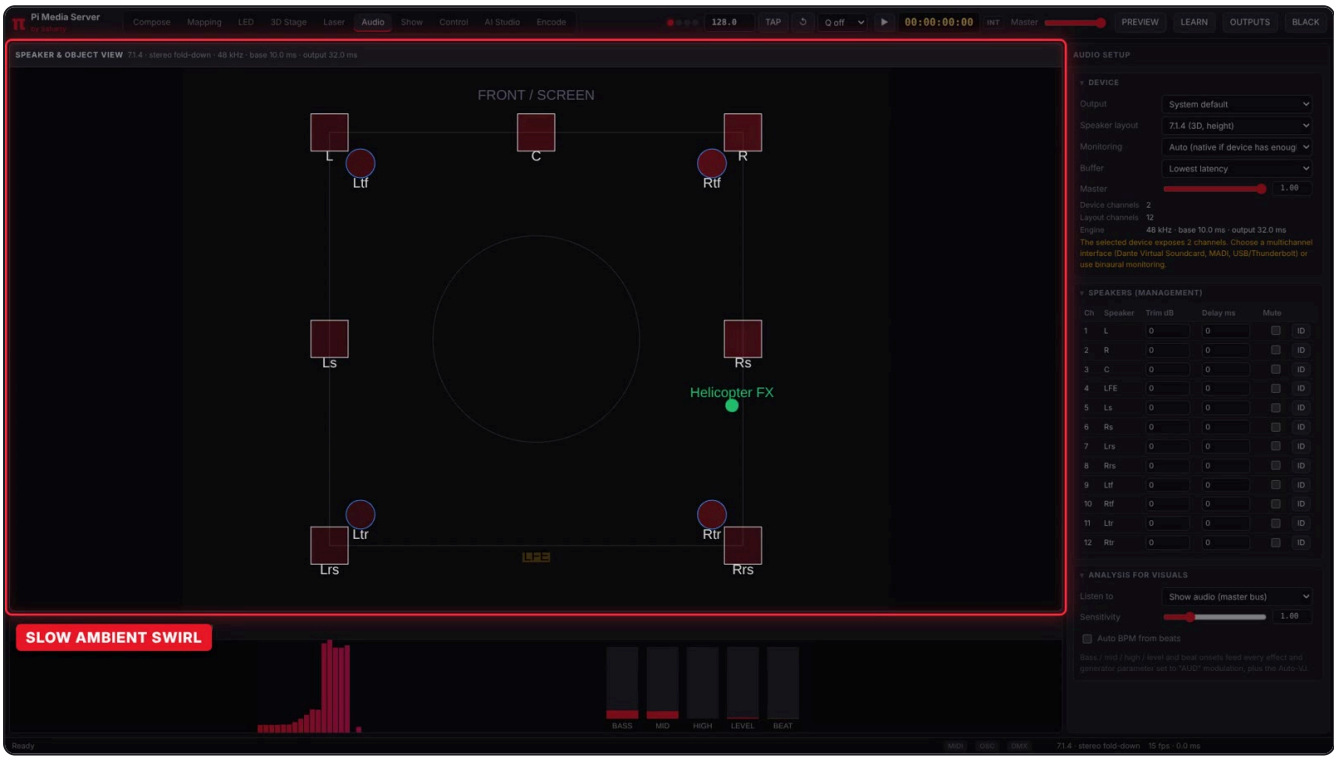


Figure 33. An audio object orbiting the room ▶ Animated in the online manual

Analysis for visuals

Listen to chooses the show audio (master bus) or any audio input. **Sensitivity** (0.1–4, default 1) sets the response. The panel shows **BASS**, **MID**, **HIGH**, **LEVEL** and **BEAT**, which drive every parameter set to **AUD** modulation and the Auto-VJ. **Auto BPM from beats** follows the tempo.

> **Note:** Encoded immersive streams that need a licensed decoder are not decoded. Export an ADM BWF master from your DAW or renderer instead: it plays with full object metadata.

SHOW CONTROL AND TIMECODE

The **Show** workspace has four tabs: **Cue List**, **Timeline**, **Plan (conference)** and **Schedule**.

Cue List

- **GO** (or Space) fires the next cue, **BACK** goes back, **STOP** stops.
- **+ Cue** adds a cue. **Record Current State** creates a cue from the current look.
- Each cue has a **Number**, **Name**, **Pre-wait (s)** (0–60) and **Auto-follow (s, -1 off)** (–1 to 120).

Cue actions: **Trigger Clip**, **Trigger Column**, **Clear Layer**, **Clear All**, **Set / Fade Parameter**, **Set BPM**, **Send OSC**, **Send MIDI**, **Set DMX Channel**, **Blackout**, **Fade Master**, **Fade Audio Master**, **Timecode Play**, **Timecode Stop** and **AI Generate Look**.

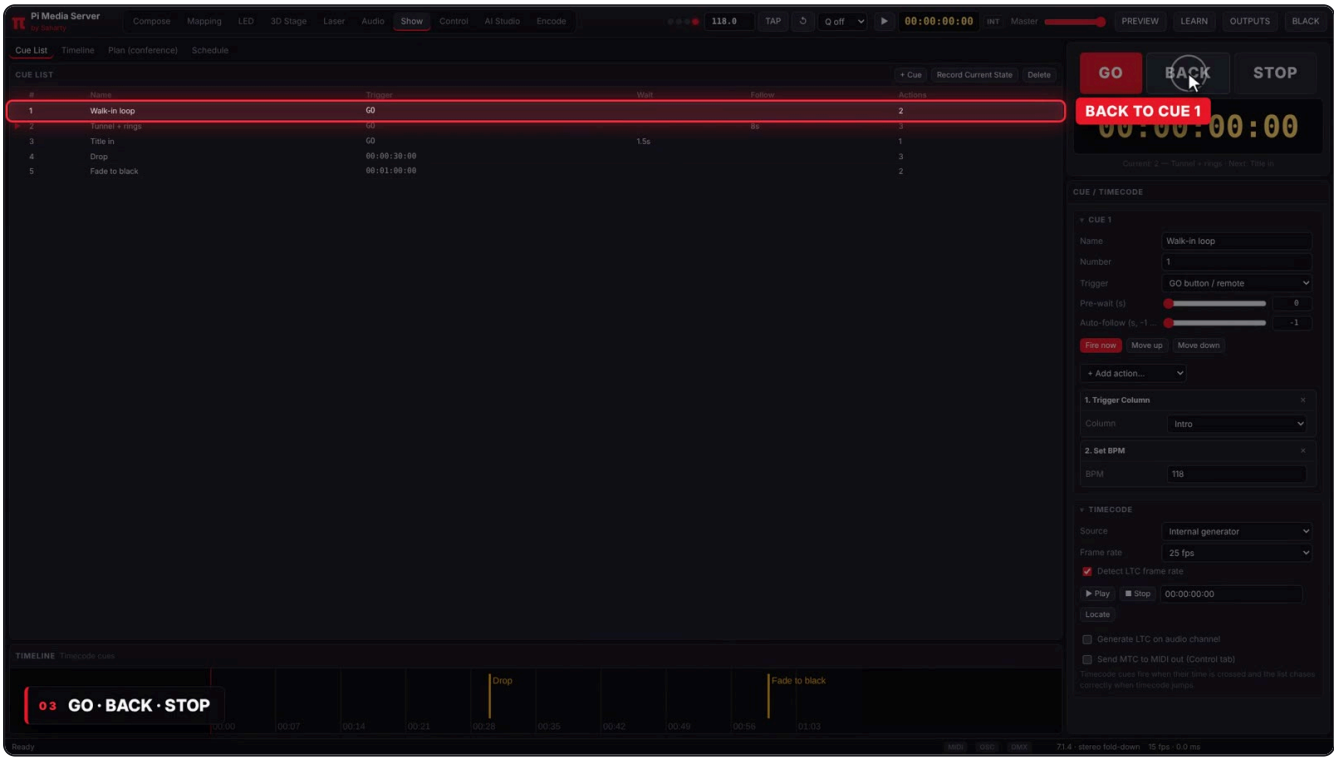


Figure 34. The Cue List with GO, BACK and STOP

Timecode

Click the timecode display in the top bar to choose the **Source**:

Source	Notes
Internal generator	Play / stop with ▶ or Shift+Space; ⏮ **Zero** and **Locate**
LTC (audio input)	Choose the **LTC input** and **Input channel**; **Detect LTC frame rate**
MTC (MIDI in)	From the MIDI input

Source	Notes
Art-Net timecode	Received on UDP 6454
OSC /pims/timecode	`"hh:mm:ss:ff"` strings

Frame rate: 24, 25, 29.97 DF or 30 fps (default 25). Pi Media Server can also **Generate LTC on audio channel** and **Send MTC to MIDI out**.

Cues chase correctly when the timecode jumps.

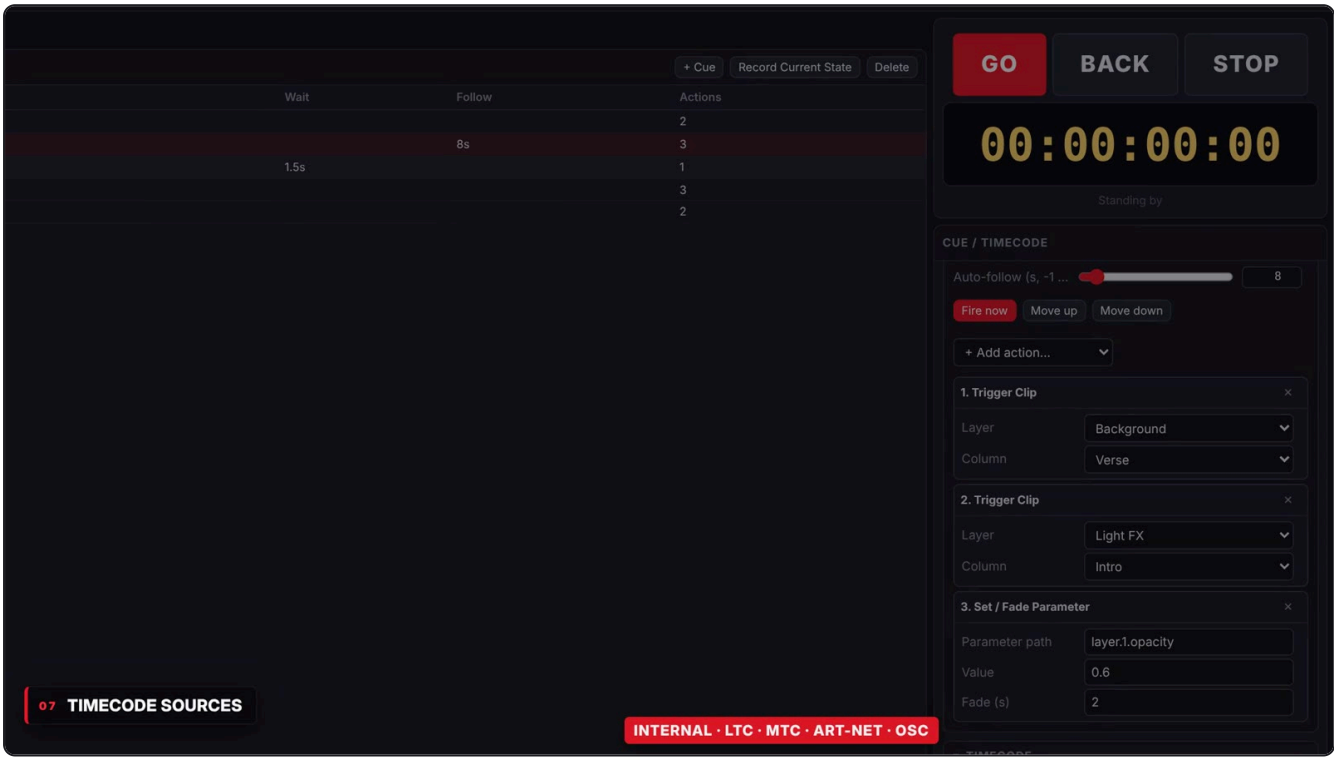


Figure 35. Timecode sources: internal, LTC, MTC, Art-Net and OSC

Clips on timecode

Right-click a clip and choose **Timecode: Lock to Current TC**, or open the clip's **Timecode** section:

Control	Range / default
Start TC	hh:mm:ss:ff (**Set to current**)
Length override (s)	0–3600, 0 = clip length
Offset (frames)	–500 to 500
Free-wheel (s)	0–10, default 1
Hold frame when TC stops	On / off
Trigger when TC enters, **Clear when TC leaves**	On / off

The clip triggers itself when the show timecode reaches its start. It chases frame-accurately (seeking on jumps and nudging the rate on drift), holds its frame when the timecode stops, free-wheels through dropouts and clears its layer at the end. Locked clips show a **TC** tag in the deck.

Timelines

Click **+ New** on the Timeline tab. Add:

- **+ Clip track**: frame-accurate clips (video positions locked to the timeline). Drag to move, drag the right edge to trim, right-click for **Set exact start / length...**.
- **+ Parameter track**: keyframes for any parameter path (for example `comp.opacity`, `layer.1.opacity`, `bpm`; Learn mode shows paths). Click the lane to add a key; right-click for **Ease: linear**, **smooth**, **in**, **out** or **hold**.
- **+ Cue track**: fires cues from the Cue List.

Timeline options: **Loop**, **Clear layer in gaps** and **Chase timecode from** a start time.

Plan (conference mode)

Add sessions with **+ Session**. Each row has **Start**, **Title**, **Speaker**, **Min**, **L3** (lower third) and **Timer** (speaker countdown). **Use current look** captures the current deck state for that session. Choose the **Lower-third layer** and **Speaker-timer layer**, drag rows to reorder, and run the day with ◀ **Prev**, **Next** ▶ or **GO** on a row. Remote: OSC `/pims/plan/next`, TCP `PLAN NEXT`.

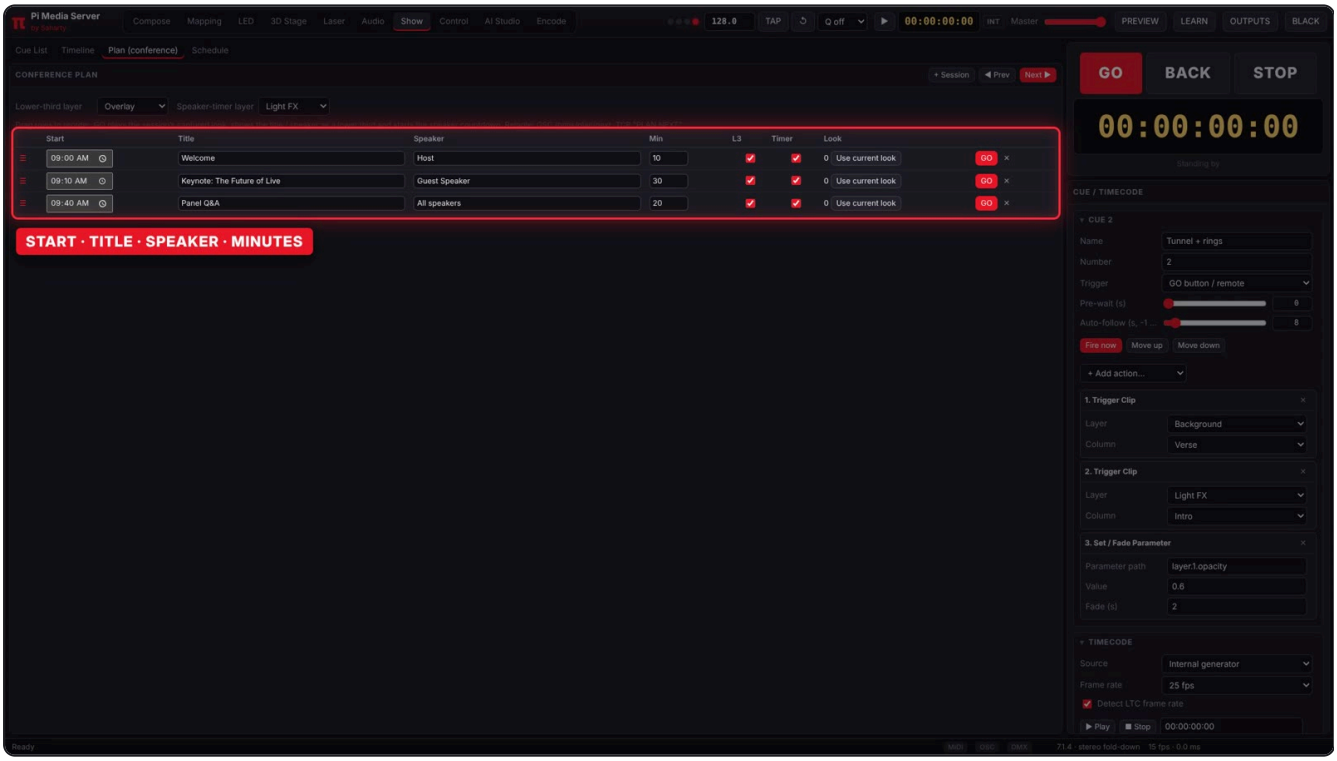


Figure 36. The conference plan: start, title, speaker and minutes

Schedule

+ Event runs an action at a set date and time (**Once**), **Daily** or **Weekly** on chosen weekdays. Actions: **Cue GO (next)**, **Fire cue #**, **Trigger column #**, **Play timeline**, **Stop timeline**, **Plan session #**, **Blackout**, **Open outputs**, **Close outputs** and **Clear all layers**. **Run now** tests an event.

External monitors

Program → Monitors... opens monitor windows on any display (or windowed): multiview grids (2 side by side, 2 × 2, 1 big + 5, 2 big + 4, 3 × 3, 4 × 4) with Program, Preview, layers, outputs, laser outputs and a **Clock / timecode** tile, with red / green / orange tally borders (**Labels and tally borders**); or a **Tabs** view that switches full-window sources with tabs or keys 1–9.

CONTROL

The **Control** workspace connects controllers, lighting desks, control systems, phones and other servers.

Learn mode

1. Click **LEARN** in the top bar. Learnable controls are outlined in amber.
2. Click a control (a fader, a clip, a column, a button).
3. Move a MIDI fader, send an OSC message or change a DMX channel. The mapping is created and shown in **Mappings**.
4. Press **Esc** or click **LEARN** again to exit.

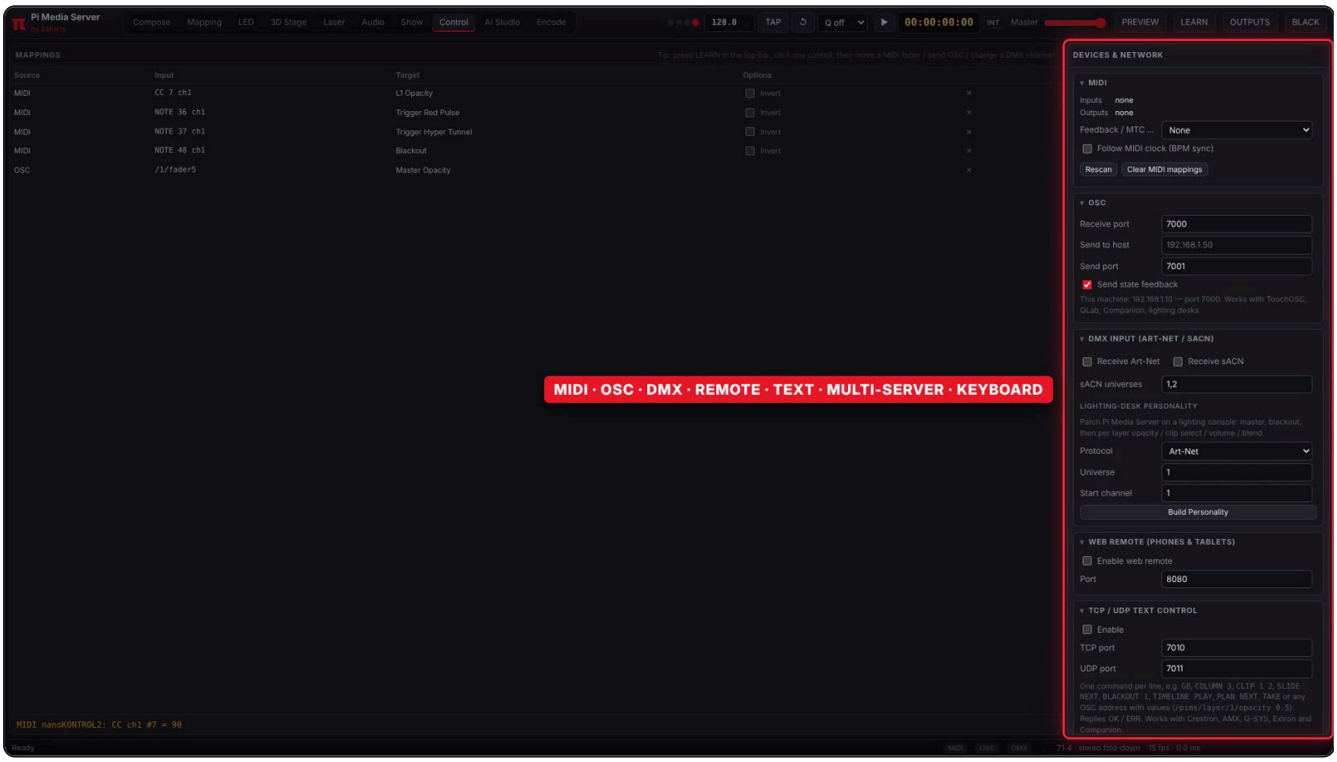


Figure 37. Learn mode: every learnable control is outlined

MIDI

- Choose the MIDI **Input** and **Feedback / MTC out** device.
- Notes, CC, pitch bend and program change can be learned.
- **Follow MIDI clock (BPM sync)** locks the tempo to an external clock.
- Feedback lights up pads mapped to clips: playing, filled and empty cells use different velocities.
- **Clear MIDI mappings** removes all MIDI mappings.

OSC

Receive port (default 7000), **Send to host** and **Send port** (default 7001) for feedback, with **Send state feedback**. The full address list is under **Help → OSC Address Reference** (see *Remote control reference* below).

DMX input

Turn on **Receive Art-Net** and/or **Receive sACN** (with **sACN universes**). Learn any control from a DMX channel, or build a **Lighting-desk personality**: set **Universe**, **Start channel** and **Protocol**, then click **Build Personality**. It maps the master and blackout, then four channels per layer (opacity, clip select, audio level and blend mode).

Web remote

Turn on **Enable web remote** (default port 8080). Any phone or tablet on the network can open `http://<ip>:8080` for GO / Back, column triggers, layer faders, master and tap. `http://<ip>:8080/paint` is a full-screen finger-painting pad for paint clips and painted masks. The same OSC addresses work over HTTP: `GET /api/osc/pims/...?v=value`.

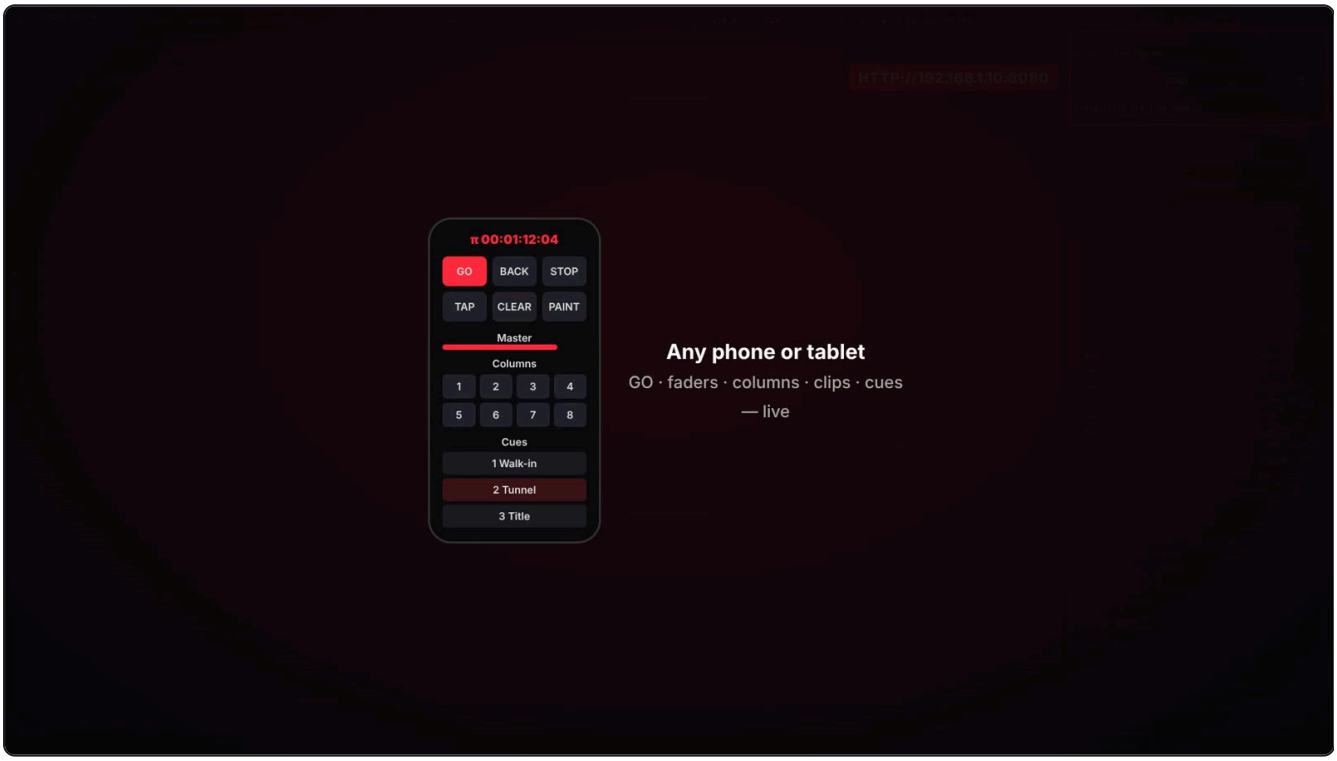


Figure 38. The web remote on any phone or tablet

TCP / UDP text control

Turn on text control (default TCP port 7010, UDP port 7011). Send one command per line; the server replies `OK` or `ERR <reason>`. Commands: `GO`, `BACK`, `STOP`, `TAP`, `RESYNC`, `TAKE`, `BLACKOUT 1`, `COLUMN 3`, `CLIP 1 2` (layer, clip), `CLEAR` / `CLEAR 2`, `OPACITY 1 0.5`, `MASTER 0.5`, `VOLUME 0.8`, `BPM 128`, `CUE 4`, `SLIDE NEXT` / `PREV` / `n`, `TIMELINE PLAY` / `STOP` / `PAUSE` / `n`, `PLAN NEXT` / `PREV` / `n`, `TIMER START`, `TEST 1`, `PROMPT text`, or any OSC address with arguments. Works with Crestron, AMX, Q-SYS and Extron.

Stream Deck and Bitfocus Companion

The **Stream Deck / Bitfocus Companion** section lists suggested button commands for a Companion **Generic TCP** or **Generic OSC** connection. Pi Media Server sends feedback to Companion.

Multi-server

Turn on **Enable multi-server** and choose **This server**:

- **Main — controls the show**
- **Backup — mirrors main, takes over automatically**
- **Render node — mirrors main for extra outputs**

Settings: **Show group name**, **Sync UDP port** (default 7020), **Peer IPs (blank = broadcast)**, **Failover after (s)** (default 1.5) and **On failover send OSC** (for example to a video switcher). The main sends triggers, levels, tempo, timecode, video positions, slides and timelines 10 times per second. The backup takes over when the main goes silent and returns to standby when it comes back. **Push Show & Media to Peers** sends the show file and every media file it uses; peers keep their own outputs and audio devices.

NDI and stream outputs

- **+ NDI Output**: send the composition, any layer or any mapped output as NDI 6. NDI sources also appear as inputs in the browser.
- **+ Stream Output**: **RTMP (YouTube, Facebook, Twitch, vMix)**, **SRT**, or **Browser (any device on the network)**, viewable at `http://<ip>:8091/view`. Set the **Source**, **Resolution**, **Frame rate** and **Video kbps**. Streams are encoded with the bundled FFmpeg (H.264 + AAC); show audio is mixed to stereo.

AI STUDIO, ENCODING AND PERFORMANCE

Offline AI looks

The offline AI engine needs no internet or API keys.

1. Type a prompt (colours, moods, motion, energy, shapes, effects, quoted text), or click one of the **Ideas**.
2. Choose the **Target layer**.
3. Click ✨ **Generate Look** (Cmd/Ctrl+Enter). A live generative shader with a modulated effect chain lands on the layer.

Other buttons: **4 Variations** (four looks in free cells), **Generate Effect for Selection** (an effect chain for the selected clip or layer) and **Render to Video Clip** (saves a WebM file, **Video length (s)** 2–120). From OSC: `/pims/layer/{n}/prompt "text"`.

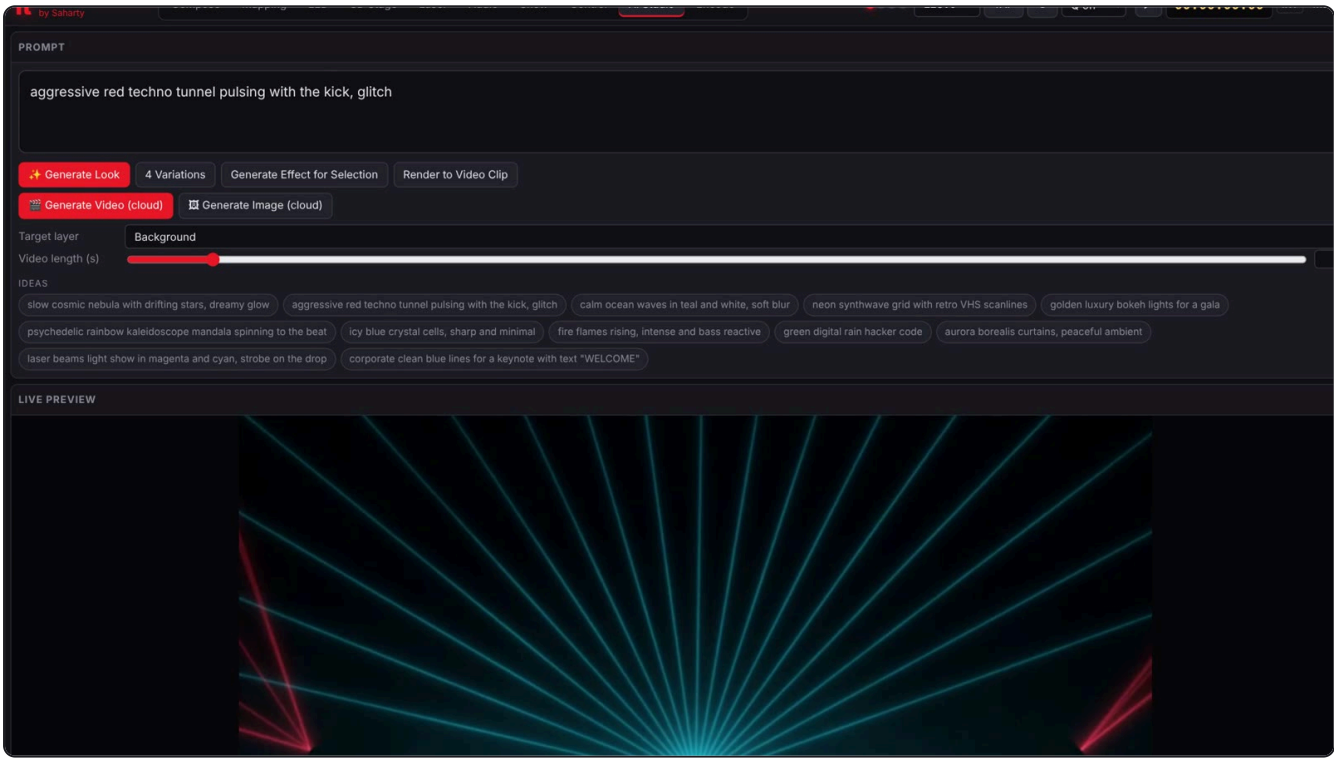


Figure 39. Generate a look from a prompt ▶ Animated in the online manual

Auto-VJ

Turn on **Let the AI perform (follows music energy & phrasing)** in the **Auto-VJ** section and set **Phrase (beats)** (4–64). Auto-VJ triggers columns and gradually changes the looks with the music.

Cloud AI (your own keys)

Open **AI Preferences…** (or **Preferences…**) and enter keys for the providers you use: Google Gemini API, fal.ai, Runway, Luma, OpenAI, Black Forest Labs and Stability AI, or a custom HTTP endpoint. Keys are stored only on this computer; prompts go to the provider you choose and are billed to your account.

- **Video**: Google Veo 3.1 and Gemini Omni, Kling, Seedance, Hailuo, Wan, FLUX and Grok through fal.ai, Runway Gen-4.5 and Luma Ray 2, at 720p, 1080p or 4K (where supported), 4–15 s long. **Convert finished clips to DXV3 for GPU playback** is available.
- **Images**: Nano Banana, GPT Image 2, FLUX.2, Seedream, Stability AI and others.

Click 🎬 **Generate Video (cloud)** or 🖼 **Generate Image (cloud)**. Jobs run in the background (video usually takes 1–5 minutes) and land in the deck.

Mode: **Offline engine + cloud on demand**, or **Cloud only (online)**, where Generate Look renders photoreal video while the computer is online. Offline, the built-in engine always takes over.

Encode workspace

Convert media into show formats in batches.

1. Drop files or folders, or click **+ Files...** / **+ Folder...**.
2. Choose the **Format**: **DXV3 Normal Quality**, **DXV3 Normal Quality + Alpha**, **DXV3 High Quality**, **DXV3 High Quality + Alpha**, **HAP**, **HAP Alpha**, **HAP Q**, **HAP Q Alpha**, **H.264 (hardware encoder)**, **H.265 / HEVC (hardware encoder)**, **AV1 (hardware encoder)** or **WAV 24-bit (audio only, all channels)**.
3. Set **Resolution** (keep, up to 12K or custom), **Frame rate** (keep, or 23.976–60), **Quality** (H.264 / H.265 / AV1: Standard, High (show playback), Maximum) or **Encoder threads** (DXV / HAP).
4. Choose the delivery options: **Keep audio (PCM in .mov, AAC in .mp4)**, **Protect (encrypt): plays only in Pi Media Server** (`.pimx`), **Replace the originals in the deck when done** and **Add finished files to the selected layer**.
5. The queue shows progress, speed and time left. **Stop all** and **Clear finished** manage it.

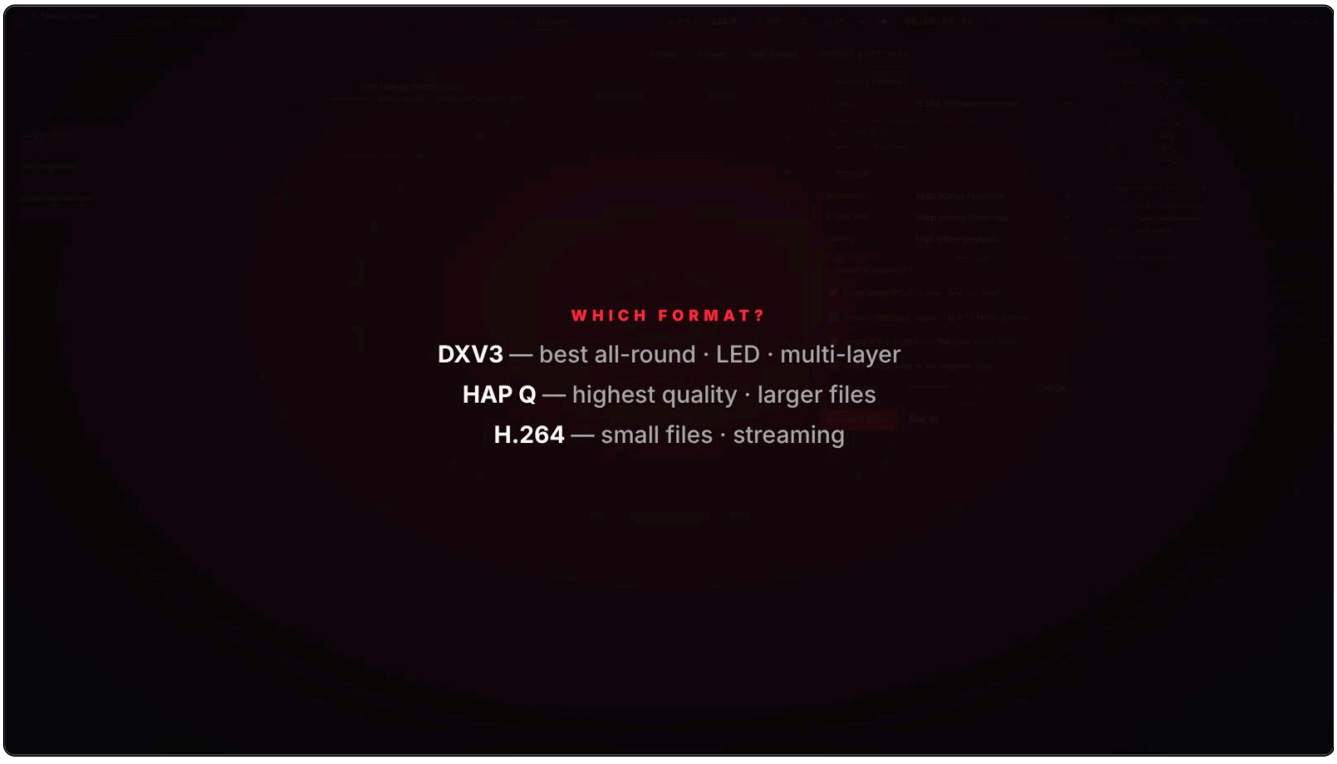


Figure 40. Which format: DXV3, HAP Q or H.264

Format	Best for
DXV3	Best all-round choice: LED, multi-layer, frame-accurate, up to 12K
HAP Q	Highest image quality, larger files
H.264 / H.265 / AV1	Small files and streaming; hardware decoding stops at about 4K (H.264) or 8K (H.265)

GPU & Performance

Open it from **Preferences → GPU & Performance...** or by clicking the GPU name in the status bar. It shows the GPUs found, renderer, driver, GPU codecs (DXT1/3/5, BC4/BC5, BC6H/BC7), maximum texture size, float buffers, CPU and GPU frame time, late frames and estimated render memory, with tips.

Setting	Options
Use the high-performance (discrete) GPU	On / off
Graphics API	Automatic, or a specific API for your system (Direct3D 11, Direct3D 11 on 12, Vulkan, Metal, OpenGL)
Sync	**V-sync on — tear-free, locked to the display** or **V-sync off — lowest latency, may tear**
GPU memory budget	**Driver default**, 4, 8, 12, 16 or 24 GB
Composition precision	**Automatic (float up to 8K, 8-bit above)**, **16-bit float (best gradients)**, **8-bit (half the memory, fastest)**
UI preview quality	Full, Half, Quarter
Render rate cap	**Follow the output display**, 120, 60, 50 or 30
DXV / HAP decode threads	Automatic, or 2–16

Auto-tune measures the show and picks the fastest settings that keep the display's frame rate. Graphics API, GPU selection, V-sync and memory limit take effect after a restart.

SETTINGS & PREFERENCES

Open **Preferences...** with Cmd+, (macOS, under the app menu) or Ctrl+, (Windows, **File** menu).

Section	Settings
AI — cloud mode	**When online, use only cloud AI**
AI — provider keys	Keys for Google Gemini API, fal.ai, Runway, Luma, OpenAI, Black Forest Labs, Stability AI
AI — realistic video	**Video provider**, **Video model**, **Resolution**, **Length**, loops, auto-convert to DXV3
AI — realistic images	**Image provider**, **Image model**, custom endpoint (URL, key, header, JSON body, result field)
AI — design model	**Use an OpenAI model to design looks & effect chains**, **Design model**
Performance	**Prevent display sleep while outputs are open**, **GPU & Performance...**

Click **Save** to apply. Preferences and panel layouts are stored per computer; the show itself (deck, mapping, LED, 3D, laser, audio, cues and mappings) is stored in the `.pims` file.

KEYBOARD SHORTCUTS / REMOTE CONTROL

Keyboard shortcuts

Key	Action
Space	Cue GO
Shift+Space	Play / stop internal timecode
1 – 9	Trigger column
T	Tap tempo
B / Cmd/Ctrl+B	Blackout
Cmd/Ctrl+T	Test pattern on all outputs
Cmd/Ctrl+Shift+O	Open all outputs
Cmd/Ctrl+Shift+W	Close all outputs
Cmd/Ctrl+N / O	New show / Open show
Cmd/Ctrl+S / Shift+S	Save / Save as
Cmd/Ctrl+I	Import media
Cmd/Ctrl+Z / Shift+Z	Undo / Redo
Delete	Remove selected clip
Alt-drag clip	Copy clip
Double-click slider	Reset to default
Right-click ~ button	Modulation settings
Esc	Exit learn mode; emergency stop in the Laser workspace
→ / PageDown, ← / PageUp	Next / previous slide
Cmd/Ctrl+P	Preview mode
Cmd/Ctrl+Enter	TAKE (preview → live)
Cmd/Ctrl+Shift+P	Presenter View
Arrow keys (Mapping)	Nudge the selected point (Shift = fine)

OSC address reference (default receive port 7000)

Layers and columns are numbered from 1.

Address	Action
`/pims/layer/{n}/clip/{m}/connect`	Trigger clip m on layer n
`/pims/layer/{n}/clear`	Clear layer
`/pims/layer/{n}/opacity f` · `/volume f`	0–1
`/pims/layer/{n}/bypass i` · `/solo i`	0 / 1
`/pims/layer/{n}/blend i`	Blend mode index
`/pims/layer/{n}/select f`	0–1 selects a clip
`/pims/layer/{n}/prompt s`	AI-generate a look on layer n
`/pims/column/{m}/connect`	Trigger column
`/pims/composition/opacity f` · `/clear`	Master · clear all
`/pims/blackout i`	0 / 1
`/pims/bpm f` · `/pims/tap` · `/pims/resync`	Tempo
`/pims/cue/go` · `/back` · `/stop` · `/pims/cue/{n}/go`	Cue list
`/pims/audio/master f`	Audio master
`/pims/timecode s`	`"hh:mm:ss:ff"` when the source is OSC
`/pims/slides/next` · `/prev` · `/goto n`	Presentations
`/pims/take` · `/pims/preview i`	TAKE · preview mode
`/pims/timeline/play` · `/pause` · `/stop` · `/seek f` · `/{n}/play`	Timeline
`/pims/plan/next` · `/prev` · `/{n}/go`	Conference plan
`/pims/timer/start` · `/stop` · `/reset` · `/toggle`	Timer and countdown clips
`/pims/param s f`	Any parameter path, normalised value
`/pims/output/test i`	Test pattern
`/pims/ledproc/{n|all}/brightness f` · `/blackout i` · `/freeze i` · `/test s` · `/preset s` · `/cct f`	LED processors
`/pims/paint/clear` · `/color s` · `/size f` · `/brush s`	Finger Paint
`/pims/laser/go "name"|n` · `/stop` · `/arm 0|1` · `/blackout 0|1` · `/master f`	Lasers (arming only when allowed)
Feedback: `/pims/layer/{n}/clip/{m}/connected i`	Sent to the OSC output host

Network ports

Service	Default
OSC in / feedback out	7000 / 7001
Web remote	8080
Browser stream output	8091
TCP / UDP text control	7010 / 7011
Multi-server sync	7020
Art-Net (and Art-Net timecode)	UDP 6454
RTMP listen input	1935

TIPS FOR LIVE/STUDIO USE

- **Play DXV3 or HAP for heavy shows.** They decode on the GPU, frame-accurately, with instant cueing and smooth reverse. Use **Encode to DXV3 / HAP…** from a clip's right-click menu or the Encode workspace. ProRes and other formats the GPU can't decode are not played directly: convert them first.
- **Match the composition to the wall.** On LED shows, use **Composition = native raster** in the Smart LED Calculator so every pixel maps 1:1.
- **Rehearse in PREVIEW.** Build the next look privately, then press **TAKE** on the musical change.
- **Use quantise for clean drops. Q bar** makes column triggers land exactly on the next bar.
- **Lock critical cues to timecode.** Clips, timelines and laser cues chase LTC, MTC or Art-Net timecode, hold on stop and free-wheel through short dropouts (**Free-wheel (s)**).
- **Keep a backup server.** With multi-server sync, a backup takes over automatically after **Failover after (s)** and can switch your video switcher with **On failover send OSC**.
- **Leave headroom.** Use **Auto-tune** in GPU & Performance during rehearsal, and set displays to their native refresh rate.
- **Large ADM masters are loaded into memory.** Masters over about 30 minutes with 100+ tracks need plenty of free RAM.
- **Lasers:** stay disarmed until the show and keep a hardware e-stop within reach.
- **Use NDI to share video with other apps** such as Resolume, TouchDesigner, OBS and vMix.
- **Save often** (Cmd/Ctrl+S). Saving is available once the app is activated.

TROUBLESHOOTING

Symptom	Cause	Fix
Only the licence window appears at launch	No activation and no running trial	Activate your key, start the trial, or use offline activation
"Saving shows is not available in the free trial"	Trial mode	Activate a licence to save shows
Pictures show a watermark	Free trial	Activate a licence; the watermark disappears
Banner with a countdown	Licence moved, trial ending or deactivated	Everything works during the 24-hour notice; reactivate or move the licence back
"The licence system is not available"	The licence helper is missing or damaged	Reinstall Pi Media Server
"This licence is active on another computer"	Machine limit	Click **Move it here**, or deactivate the other computer
Output does not appear on the projector	Output not opened or wrong display	Choose the **Display** in Mapping and click **Open Output** (or **OUTPUTS**)
"This GPU supports textures up to … px"	Composition larger than the GPU allows	Use a smaller composition, split across outputs, or use a GPU with 16384 px textures
Video stutters with several layers	Codec not GPU-decoded, or beyond the hardware decoder's size	Convert to DXV3 or HAP in Encode; run Auto-tune
ProRes file does not play	Format the GPU can't decode	Convert it in the Encode workspace
LED fixtures stay dark	LED output off, wrong IP or universe	Turn on **Send pixel data**, check **Destination IP**, run **Auto Patch**, watch the **DMX Monitor**
LED processor not found	Different subnet or blocked port	Add it by hand with its IP; check the network and firewall
Tessera layout not sent	Tessera IP control has no layout commands	Use **Cabinet CSV** / **Layout JSON** / PNG exports
No laser output	Not armed, or no DAC configured	Configure a projector, then click **ARM**
Laser cannot be armed remotely	Remote arming is off	Turn on **Allow arming the lasers remotely** on the Safety tab
Only 2 channels of a 7.1.4 layout play	Device has fewer channels than the layout	Choose a multichannel interface, or **Binaural headphones**
Clips do not follow timecode	Wrong source or frame rate	Check the timecode **Source** and **Frame rate**; turn on **Detect LTC frame rate**
Phones cannot open the web remote	Remote off or different network	Turn on **Enable web remote** and use the computer's IP on the same network

Symptom	Cause	Fix
Cloud AI job fails	Missing or invalid key, or offline	Check the key in Preferences; offline, use the built-in engine
macOS blocks the first launch	Gatekeeper	Right-click the app, choose **Open**, then **Open** again
Windows SmartScreen warning	New publisher check	Click **More info → Run anyway**

SPECIFICATIONS & SYSTEM REQUIREMENTS

Specifications

Item	Specification
Version	1.4.4
Composition	Custom resolutions up to 12K (15360 × 2160 preset); Preview and Program monitors
Rendering	GPU-accelerated, 16-bit float pipeline (8-bit automatically above 8K)
Video playback	DXV3 and HAP / HAP Alpha / HAP Q / HAP Q Alpha decoded on the GPU; H.264, H.265, VP9 and AV1 hardware decoding
Mapping	Unlimited outputs, corner pin and mesh warp up to 16 × 16, edge blending with auto blend and array wizard, polygon and painted masks
LED	Art-Net, sACN and DDP pixel output; flat and curved wall designer; NovaStar COEX, Megapixel HELIOS and Brompton Tessera control; custom command templates
3D stage	OBJ, glTF and GLB models; build to scale; projector and lens catalogue; point-pair auto calibration
Laser	Ether Dream, LaserCube and IDN output; ILDA formats 0, 1, 2, 4, 5; OSC, MIDI and DMX to external laser software
Audio	Layouts up to 9.1.6; ADM BWF / BW64 / RF64 object-based masters; binaural monitoring; stereo fold-down
Control	MIDI, OSC, DMX (Art-Net / sACN in), SMPTE (LTC, MTC, Art-Net, OSC), TCP / UDP text, web remote, Stream Deck / Companion
Network video	NDI 6 in and out (runtime included); RTMP / SRT / browser stream outputs; network stream inputs
Multi-server	Main, backup and render nodes with automatic failover
Show file	`.pims`

System requirements

macOS

	Minimum	Recommended
OS	macOS 12 Monterey	Latest macOS
Processor	Apple silicon or Intel (native builds for both)	Apple M2 Pro or later
Memory	8 GB	16 GB or more
Disk	1 GB + media	1 GB + media
Graphics	Integrated GPU, 1080p output	Dedicated GPU, multiple outputs; 16384 px textures for 12K

	Minimum	Recommended
Network	—	Gigabit for NDI, LED pixel output and multi-server

Windows

	Minimum	Recommended
OS	Windows 10 64-bit	Windows 11 64-bit
Processor	Intel Core i5 / AMD Ryzen 5, 4 cores	Intel Core i7 / AMD Ryzen 7, 8 cores
Memory	8 GB	16 GB or more
Disk	1 GB + media	1 GB + media
Graphics	DirectX 12 GPU, 1080p output	Dedicated GPU (NVIDIA / AMD), multiple outputs; 16384 px textures for 12K
Network	—	Gigabit for NDI, LED pixel output and multi-server

Linux is not supported.

Compatibility notes

- Spout and Syphon are not included yet: use NDI.
- Helios USB laser DACs are not driven directly yet. DACs with closed protocols are controlled through their own laser software over OSC, MIDI, DMX and timecode.
- Brompton Tessera's IP control cannot change panel layout.

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SUPPORT

- **Email:** support@pi-ware.com
- **Website:** www.pi-ware.com (downloads, free updates, your account and licences)
- **Tutorials:** the 12-part Pi Media Server tutorial series on youtube.com/@pibysaharty
- **In the app: Help → Keyboard Shortcuts**, **Help → OSC Address Reference**, **Help → Licence Agreement...** and **Help → Open-Source Licences...**

When you contact support, include the version and GPU shown in **About Pi Media Server**, your operating system and the steps that lead to the problem.

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www.pi-ware.com · support@pi-ware.com

Video tutorials: youtube.com/@pibysaharty

Online manual with animations: https://www.pi-ware.com/manuals/pi-media-server/

Precision is a constant.

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