

Visualizers Deep Dive

User Guide

DjMirror Pulse includes five audio visualizers, all found under Settings → Layer - Waveforms : Digital , Particle , Analog , Spectrum and XY Visualizer . They show different views of the selected audio input, from a moving trace to frequency bars and radial geometry. Enable...

DjMirror Pulse User Manual Series

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Chapter 1: The 5 Audio-Reactive Visualizers — Digital, Particle, Analog, Spectrum And Xy

Chapter 2: Overview — Audio-Reactive Visualization In DjMirror Pulse

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Note

Earlier versions of this guide listed a *Peak Meter* and an *Amplitude Histogram* visualizer. They exist in the source code but are not enabled in the application, so they do not appear in Settings and are not covered here.

How It Works

The DjMirror Pulse audio engine continuously processes the incoming audio signal and produces these kinds of analysis data:

Data Type	Description	Used By
Waveform samples (raw PCM)	Time-domain amplitude of the audio signal	Analog
Frequency bands / FFT spectrum	Frequency-domain energy across bands	Digital, Particle, Spectrum, XY
Left / right channels	Separate stereo signals	XY pattern 7 (XY Oscilloscope)

Audio data flows from the input selected in **Settings** → **AUDIO Device**. If the visualizers are not reacting, first check that the audio meters move; see [Audio Setup & Beat Sync](#).

Start with one visualizer

1. Open **Settings** → **Layer - Waveforms**.
2. Make sure the layer itself is **Visible**, then open one visualizer group (**Digital**, **Particle**, **Analog**, **Spectrum** or **XY Visualizer**) and turn on that visualizer's **Visible** option.
3. Change one setting at a time — color, intensity or pattern — and look at the output screen.
4. Once it behaves as expected, add another visualizer only if the composition needs it.

The exact groups and controls depend on the visualizer. The examples below are starting ideas, not required settings. Property names in code formatting describe configuration/API fields; use the visible control names in

Settings when you are operating the app by hand.

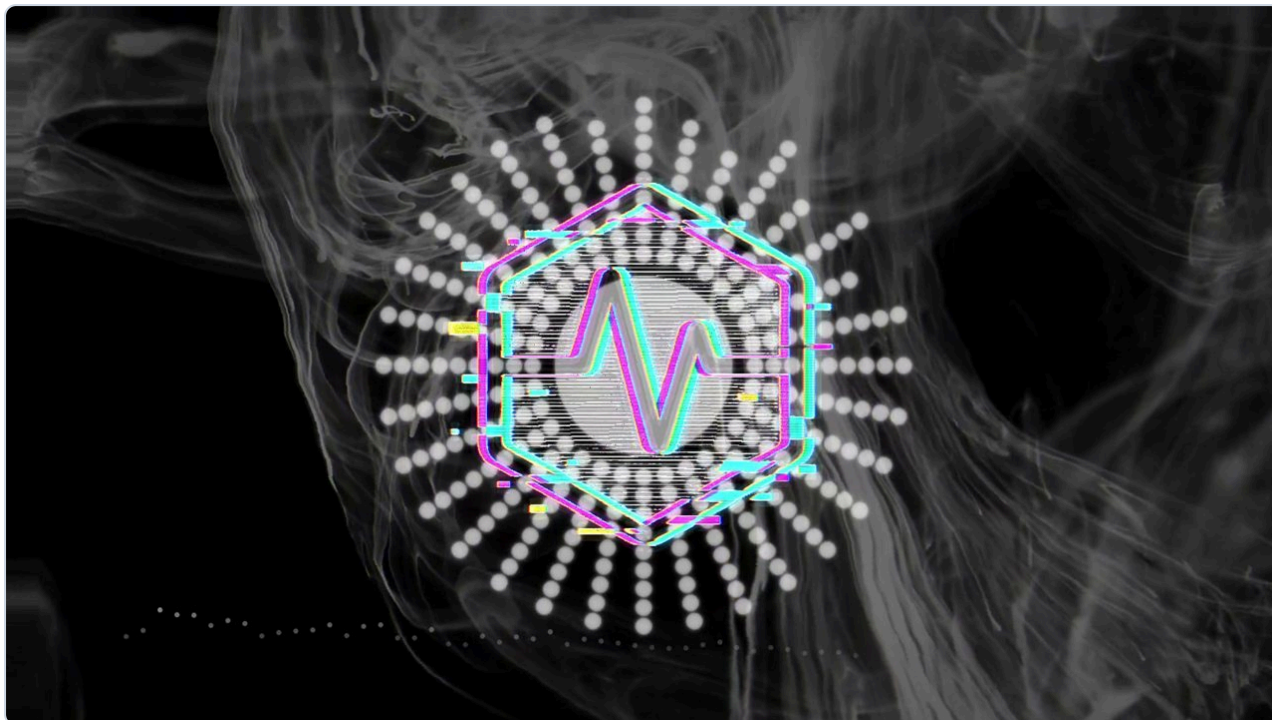


Figure 1: layered XY geometry over a smoke bed, driven by live FFT.

Tip

If motion is not responding to music, fix the audio input and level before increasing visualizer intensity.

The Layer - Waveforms page

The page you land on holds controls for the whole layer, shared by every visualizer inside it. The five groups are listed underneath it in the sidebar.

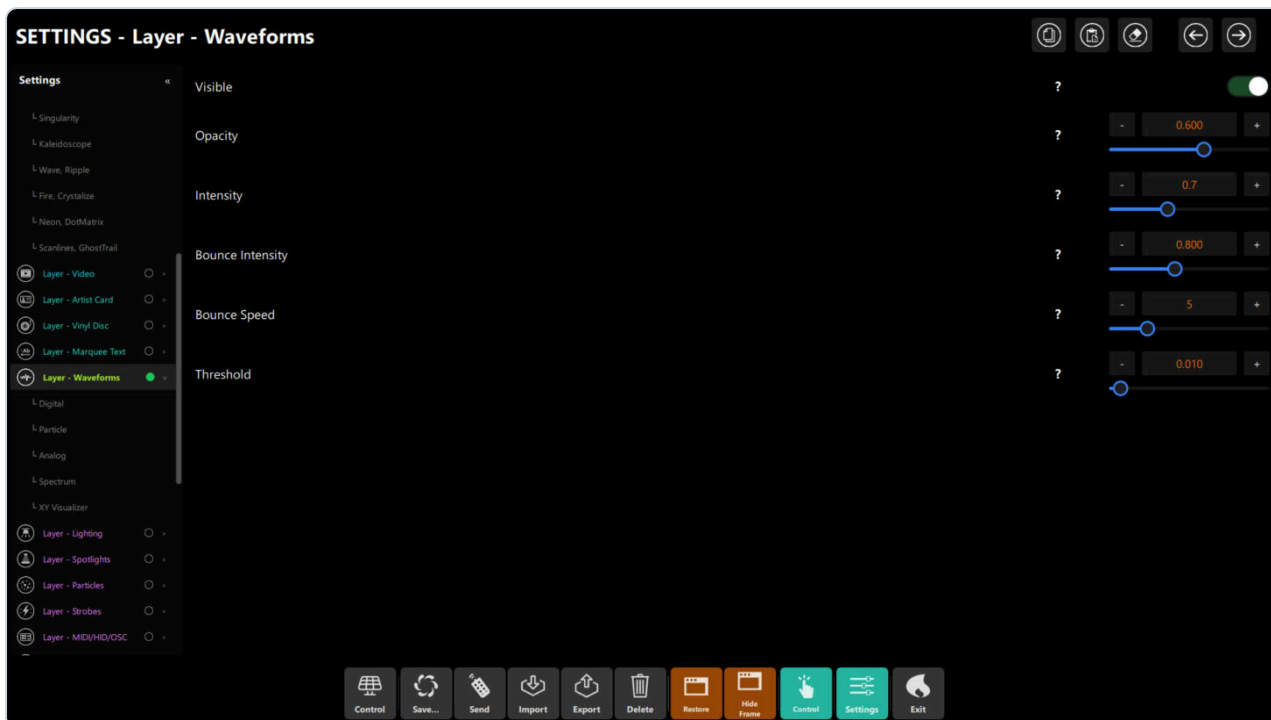


Figure: Settings → Layer - Waveforms, with the five visualizer groups listed under it.

Control	Property	Default	What it does
Visible	<code>visible</code>	on	Master switch for the whole layer — if it is off, none of the visualizers show
Opacity	<code>opacity</code>	0.6	Transparency of the whole layer
Intensity	<code>intensity</code>	0.7	Added to each visualizer's own intensity
Bounce Intensity	<code>bounceIntensity</code>	0.8	How strongly the layer pulses (scales) on a beat
Bounce Speed	<code>bounceSpeed</code>	5	How fast that pulse plays (1–10)
Threshold	<code>audioThreshold</code>	0.01	Audio-level threshold for the layer's reaction; use the ? help beside it for details

Controls every visualizer shares

Each group repeats the same core controls, so once you know them you know all five: **Visible**, **Opacity**, **Color**, **Intensity**, **Bar Count** (where it applies) and the four **margins**. To change **Color**, type a hex value and press **Apply** in the color dialog. Margins are in pixels from each edge of the output, so a large *Top Margin* pushes a visualizer down into a band along the bottom.

Chapter 3: Visualizer 1: Digital (Frequency Bars)

Settings group: Layer - Waveforms → **Digital** · **Config key:** `elements.waveFormView.waveformVisualizer`

Input: audio frequency bands · **Output:** a row of vertical bars, low frequencies on the left

Digital is the most direct monitoring view: one bar per band that rises and falls with the music. It is simple, cheap to draw and easy to read on a dark background.

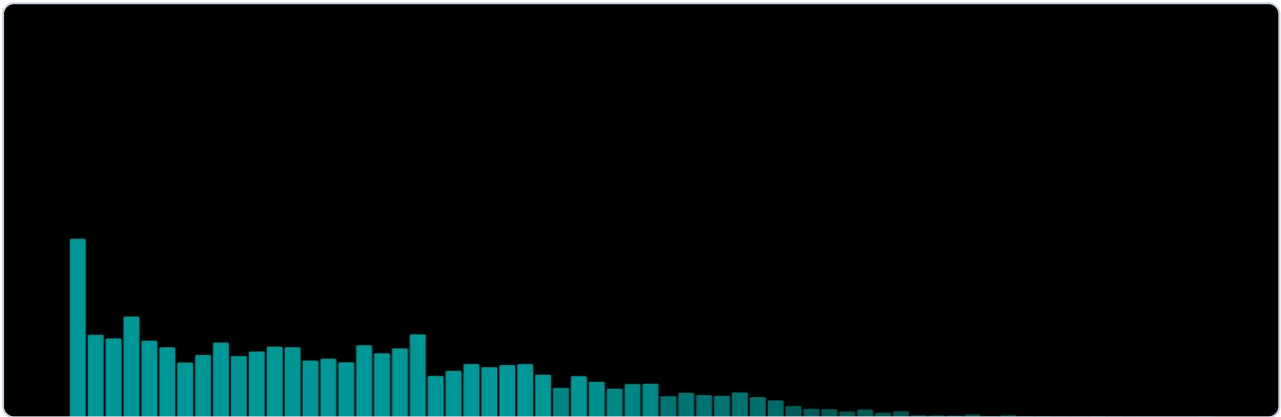


Figure: Digital on its own — 64 bars with the bass on the left. The color was set to cyan for the capture.

- **Best for:** a readable "is it alive?" reference, club screens, anything that needs a clear sense of bass vs. treble
- **Key tip:** a low **Opacity** (the default is 0.4) lets it sit under a video layer without hiding it.

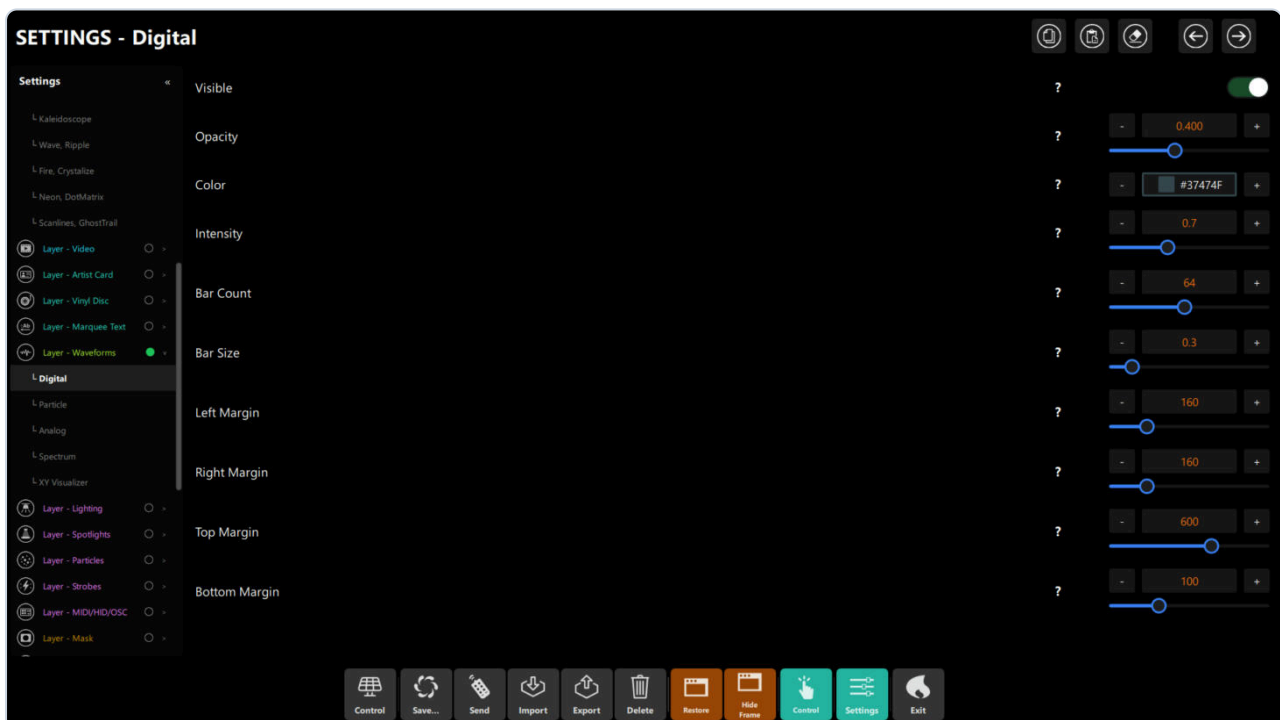


Figure: Settings → Layer - Waveforms → Digital.

Control	Property	Default	What it does
Visible	<code>visible</code>	off	Shows or hides the visualizer
Opacity	<code>opacity</code>	0.4	Transparency
Color	<code>baseColor</code>	<code>#37474F</code>	Bar color
Intensity	<code>intensity</code>	0.7	Overall amplitude of the motion
Bar Count	<code>barCount</code>	64	Number of bars
Bar Size	<code>barFactorSize</code>	0.3	Bar height scaling
Left / Right / Top / Bottom Margin	<code>margins.*</code>	160 / 160 / 600 / 100	Placement, in pixels from each edge — the default fills a band across the lower part of a 1080p screen

Chapter 4: Visualizer 2: Particle

Settings group: Layer - Waveforms → **Particle** · Config key:
`elements.waveFormView.particleWaveVisualizer`

Input: audio frequency bands · **Output:** dots (particles) emitted along the frequency axis

Particle uses the same bands as Digital but draws them as points of light instead of bars. It is lighter and more atmospheric, so it works well as a background texture behind logos or text.

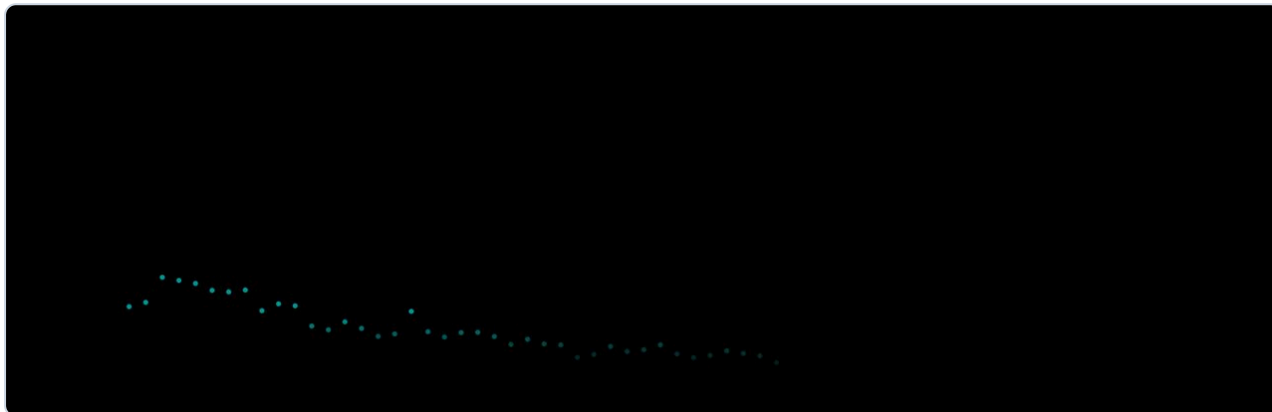


Figure: Particle on its own. The dots are small by design; raise **Intensity** or **Bar Size** for a denser look.

- **Best for:** soft backgrounds, ambient sets, layering behind an artist card
- **Key tip:** it defaults to a higher opacity (0.8) than Digital because the dots are small.

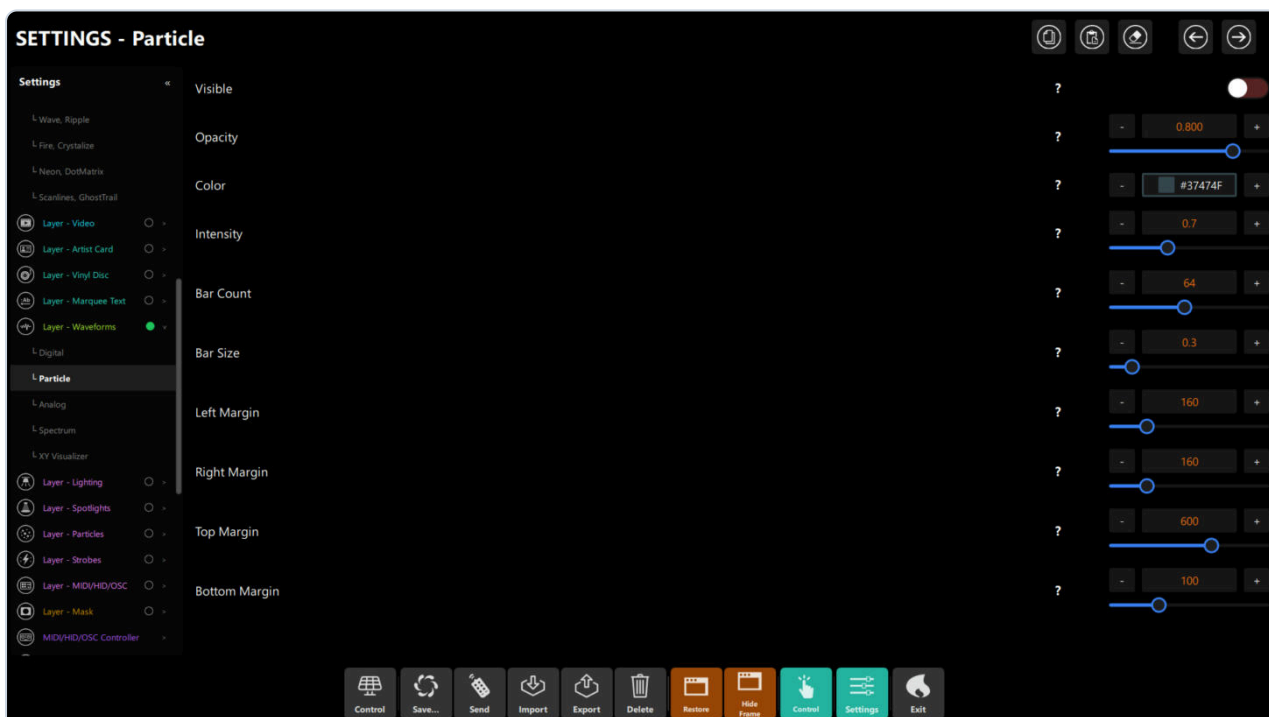


Figure: Settings → Layer - Waveforms → Particle — the same controls as Digital.

Control	Property	Default
Visible	<code>visible</code>	off
Opacity	<code>opacity</code>	0.8
Color	<code>baseColor</code>	<code>#37474F</code>
Intensity	<code>intensity</code>	0.7
Bar Count	<code>barCount</code>	64
Bar Size	<code>barFactorSize</code>	0.3
Margins (left / right / top / bottom)	<code>margins.*</code>	160 / 160 / 600 / 100

Chapter 5: Visualizer 3: Analog (Waveform Patterns)

Settings group: Layer - Waveforms → Analog · Config key: `elements.waveFormView.analogWaveVisualizer`

Input: raw audio waveform samples · **Output:** an oscilloscope-style trace with **eight** selectable patterns

Analog draws the actual shape of the audio signal — think of it as a software oscilloscope. Choose the look with **Pattern Type**; every pattern uses the same Color, Intensity and margin controls.

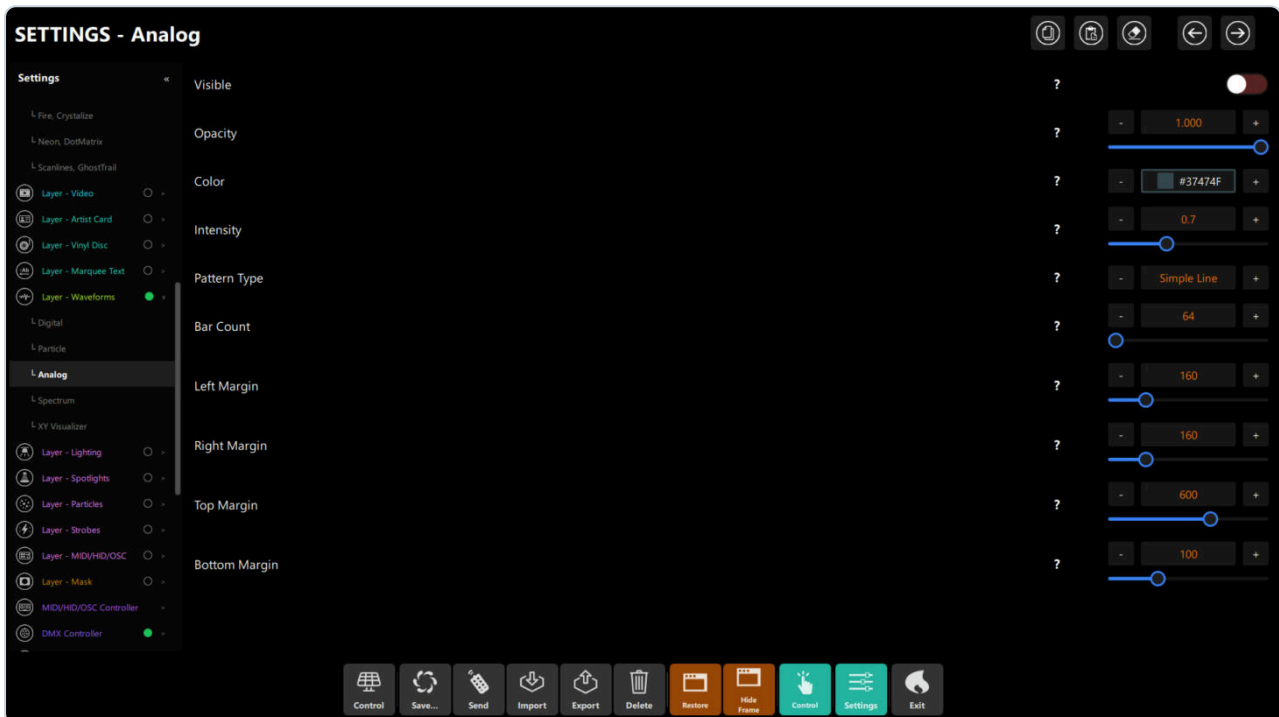
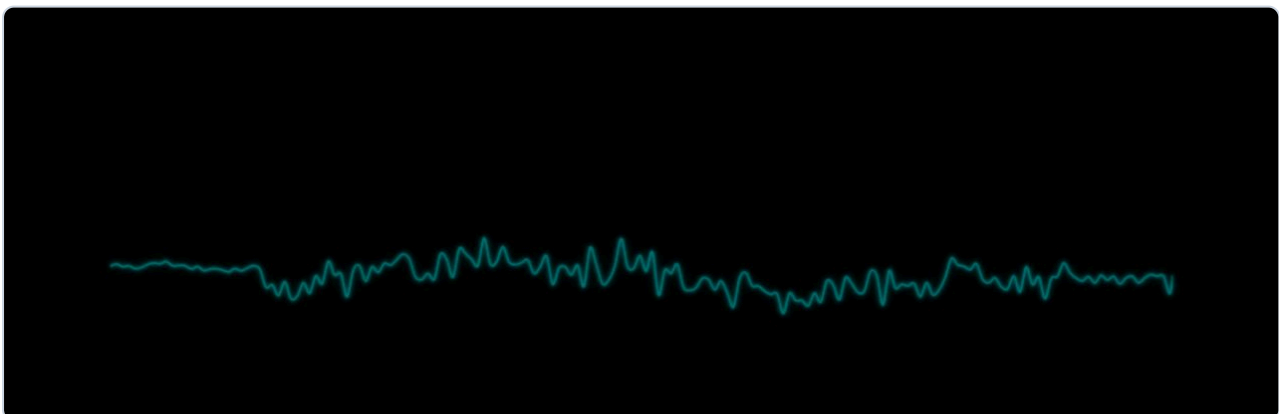


Figure: Settings → Layer - Waveforms → Analog. **Pattern Type** switches between the eight modes below.

4.1 Pattern Types

Simple Line (default)

A classic single-line oscilloscope trace. Clean, minimal and the fastest to render.



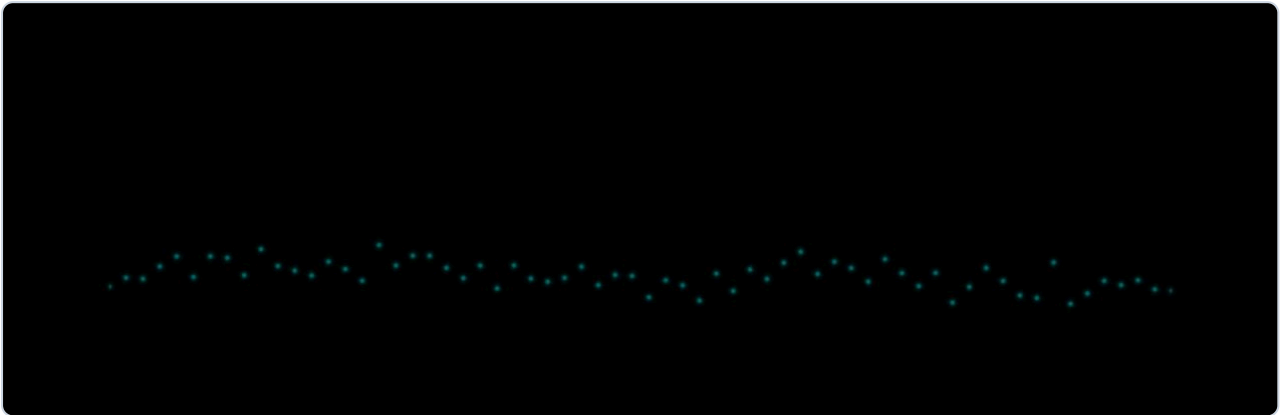
Pattern 0 — Simple Line, with only the Analog visualizer on.

- **Best for:** DJ mixing reference, technical monitoring, minimal looks

- **Key tip:** use a bright, contrasting color on dark backgrounds.

Dots

Draws individual dots spaced along the waveform path instead of a continuous line, for a bubbling, retro-digital feel. The number of dots follows **Bar Count** (up to 256).

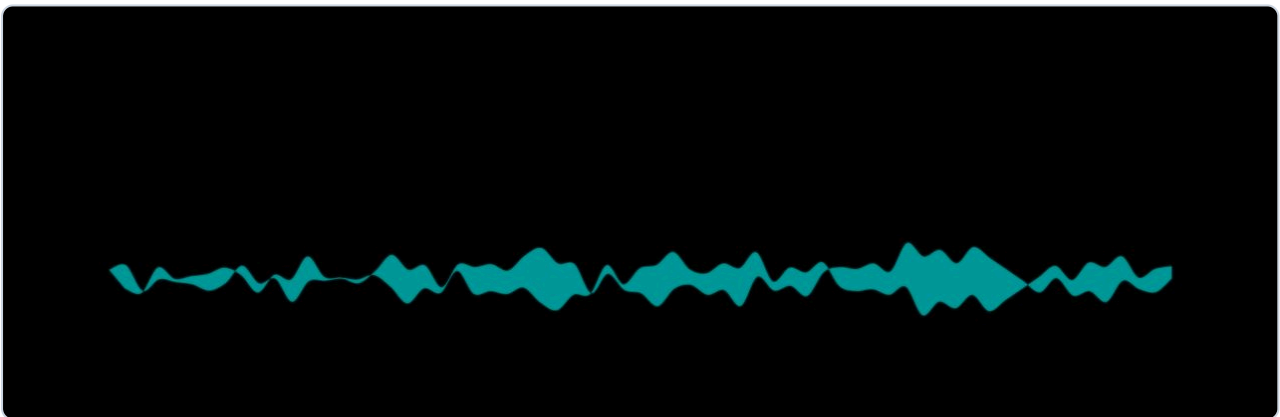


Pattern 1 — Dots.

- **Best for:** EDM, arcade aesthetics, lighter rendering
- **Key tip:** a lower **Bar Count** gives fewer, more widely spaced dots.

Area

Fills the space between the center line and the waveform with a solid color, giving a strong volumetric presence.

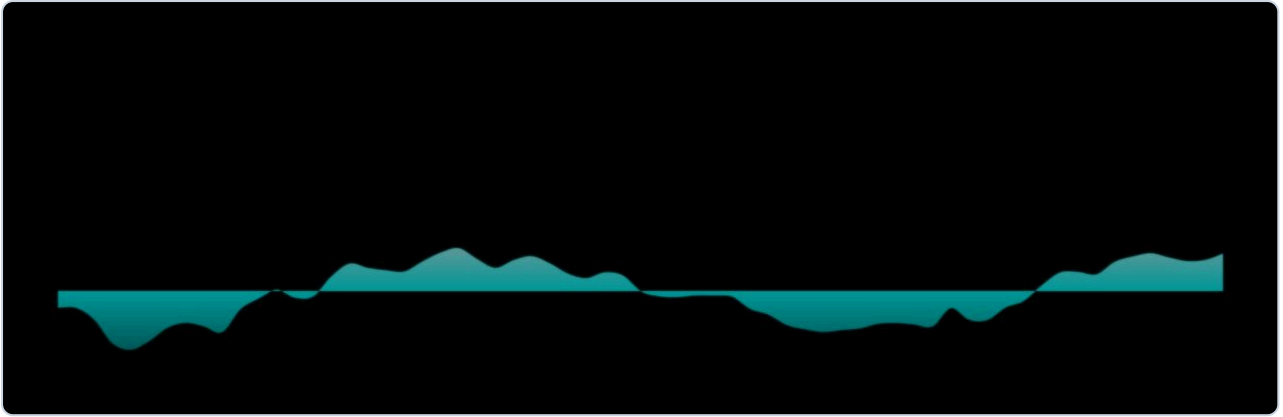


Pattern 2 — Area.

- **Best for:** dance and club environments, emphasizing amplitude dynamics
- **Key tip:** pair with a lower **Opacity** so it layers gracefully over video.

Gradient

A filled shape whose color fades from lighter to darker, derived automatically from your **Color**. It adds depth and a more polished finish.

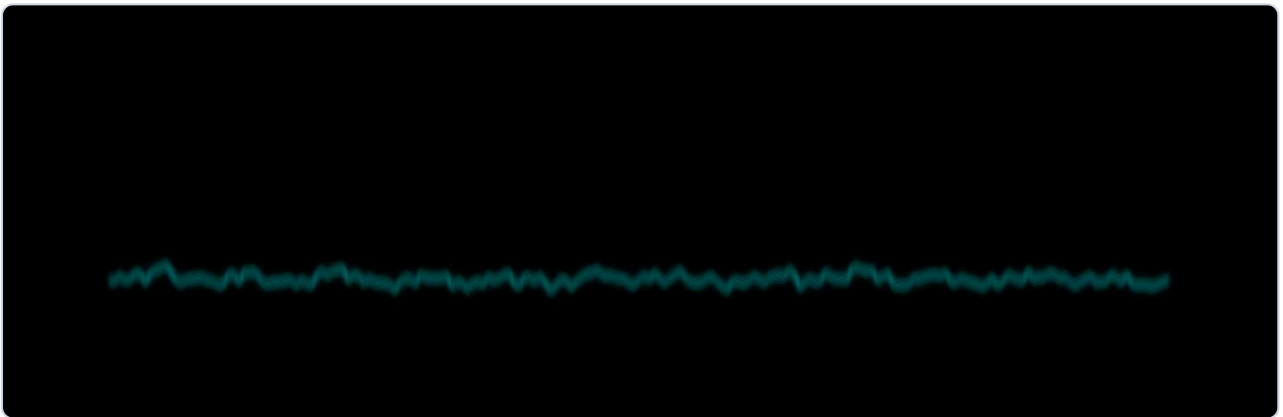


Pattern 3 — Gradient.

- **Best for:** artistic performances, festival visuals, premium productions
- **Key tip:** choose a saturated mid-tone; the lighter and darker tones are generated for you.

MultiLine

Nine parallel lines offset vertically that follow the same waveform, forming a pseudo-3D ribbon. The lines fade toward the edges of the band.



*Pattern 4 — MultiLine. The ribbon is subtle by design; raise **Intensity** for more presence.*

- **Best for:** adding depth to a composition, subtle layered looks
- **Key tip:** it reads best at moderate opacity over a darker background.

Waveform

A filled, mirrored envelope with a vertical gradient (lighter at the top, darker at the bottom). It is the most "solid" of the shapes and gives a professional, technical look.

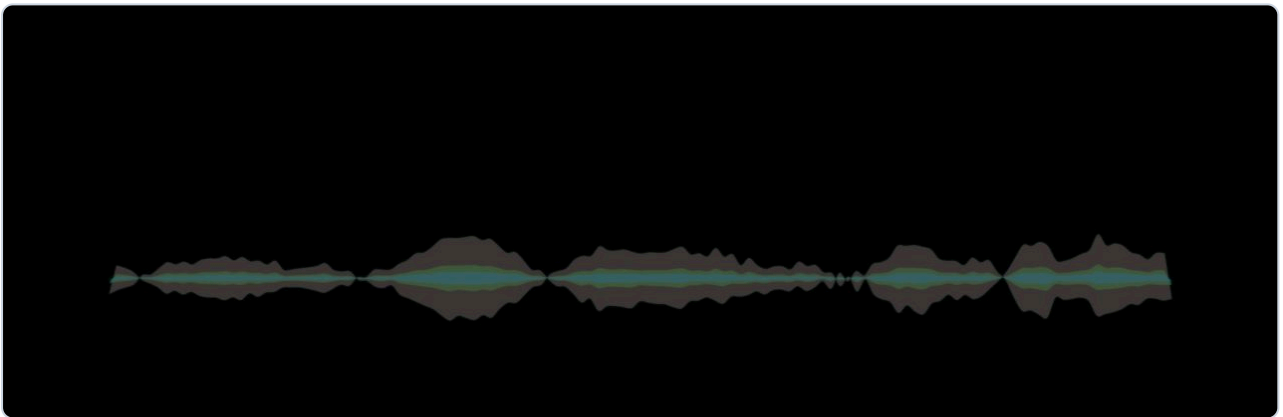


Pattern 5 — Waveform.

- **Best for:** technical monitoring, detailed waveform inspection
- **Key tip:** warm colors (yellow or amber) give the classic oscilloscope impression.

Tri-Band

A mirrored waveform split into three frequency bands, each with its own color — the style DJ software uses to show bass, mids and highs at a glance. The band colors come from the pattern rather than from the **Color** setting.

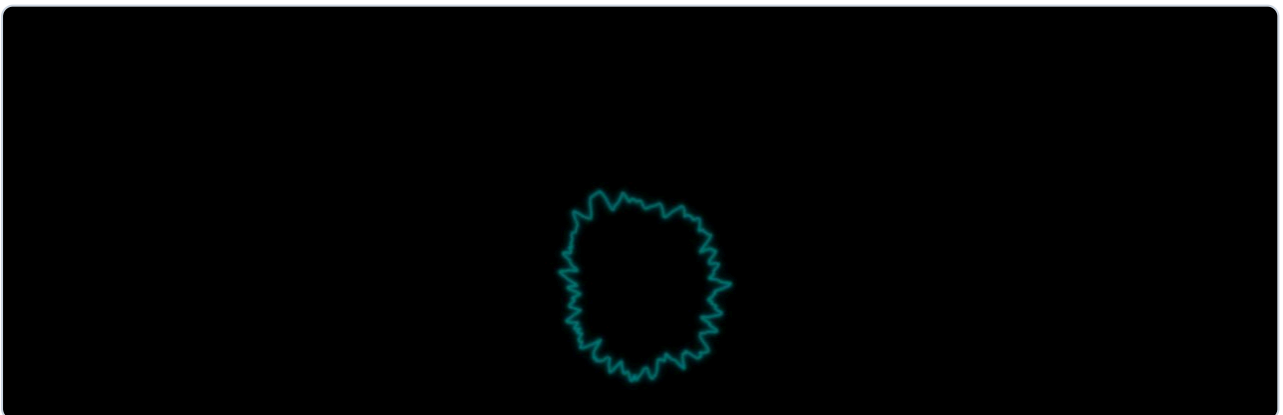


Pattern 6 — Tri-Band.

- **Best for:** reading a mix's frequency content at a glance, DJ-style displays
- **Key tip:** use it on its own; its built-in colors do not combine well with a strong custom color.

Radial

A circular scope: the waveform is wrapped into a ring that pulses with the music.



- **Best for:** a compact focal point, a logo in the center, circular layouts
- **Key tip:** the ring is drawn inside the same area as the other patterns, so a taller area (smaller *Top Margin*) gives a bigger ring.

4.2 Settings and properties

Control	Property	Default	What it does
Visible	<code>visible</code>	off	Shows or hides the visualizer
Opacity	<code>opacity</code>	1.0	Transparency
Color	<code>baseColor</code>	<code>#37474F</code>	Main trace/fill color (Tri-Band uses its own colors)
Intensity	<code>intensity</code>	0.7	Overall amplitude and glow
Pattern Type	<code>patternType</code>	Simple Line (0)	Simple Line, Dots, Area, Gradient, MultiLine, Waveform, Tri-Band, Radial (0–7)
Bar Count	<code>barCount</code>	64	Sampling resolution; sets the dot count for Dots
Left / Right / Top / Bottom Margin	<code>margins.*</code>	160 / 160 / 600 / 100	Placement, in pixels from each edge

Chapter 6: Visualizer 4: Spectrum

Settings group: Layer - Waveforms → **Spectrum** · Config key:
`elements.waveFormView.spectrumVisualizer`

Input: FFT frequency-domain data · **Output:** mirrored, rounded bars centered on a horizontal axis

Spectrum shows the energy of each frequency band as rounded bars that grow symmetrically up and down from the center line. Bass is on the left, treble on the right.



Figure: Spectrum on its own — 64 mirrored bars; the low frequencies carry most of the energy.

- **Best for:** DJs monitoring frequency balance, broadcast technical views, live A/V setups
- **Key tip:** 64 bars is a good balance of resolution and performance; use fewer for a bolder, simpler look.

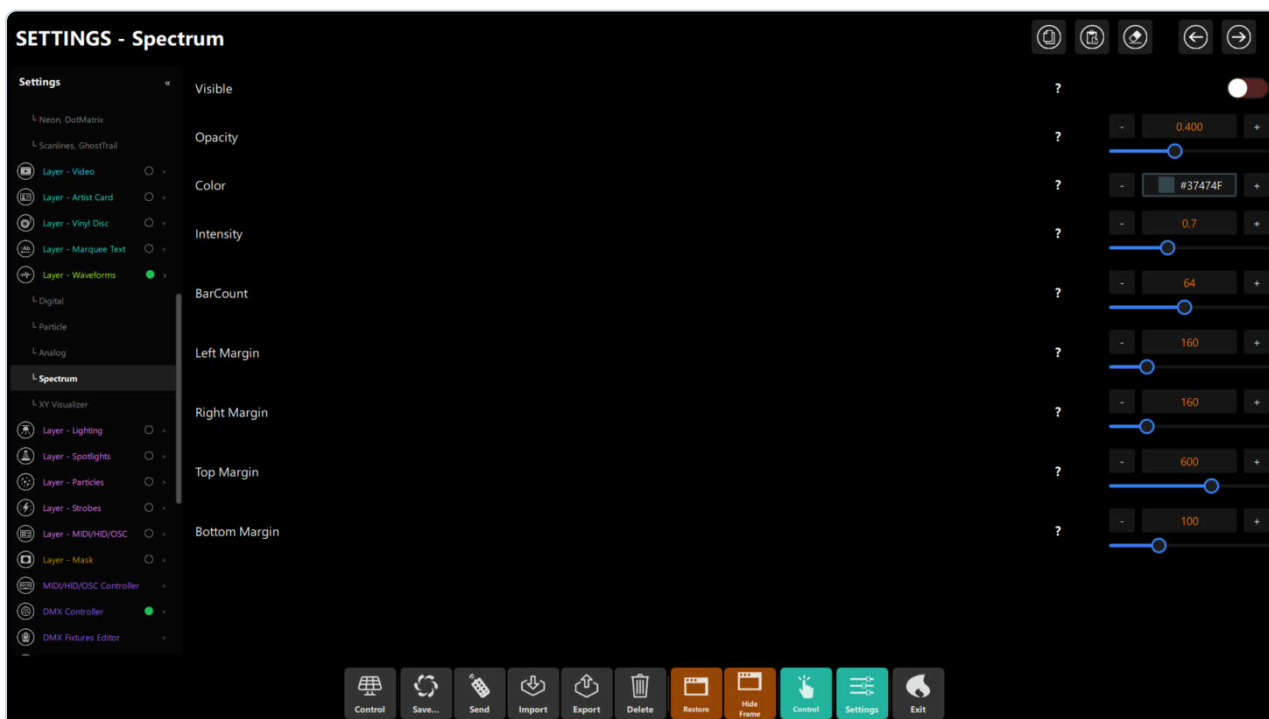


Figure: Settings → Layer - Waveforms → Spectrum.

Control	Property	Default	What it does
Visible	<code>visible</code>	off	Shows or hides the visualizer
Opacity	<code>opacity</code>	0.4	Transparency
Color	<code>baseColor</code>	<code>#37474F</code>	Bar color
Intensity	<code>intensity</code>	0.7	Overall bar amplitude
BarCount	<code>barCount</code>	64	Number of bars
Left / Right / Top / Bottom Margin	<code>margins.*</code>	160 / 160 / 600 / 100	Placement, in pixels from each edge

Note

The engine also contains a scrolling *spectrogram* mode and fixed bar spacing, corner radius and frequency-weighting values. This version does not expose them in Settings: the bars are always mirrored and rounded.

Chapter 7: Visualizer 5: Xy / Lissajous

Class: XYVisualizer

Input: FFT frequency spectrum data

Output: Circular / radial artistic patterns

The XY Visualizer transforms frequency spectrum data into radial and circular geometric shapes. While inspired by Lissajous figures, it maps the full frequency spectrum around a central ring — producing dramatically different results based on the selected pattern type. Ten patterns are available, ranging from sharp and aggressive to smooth and organic.

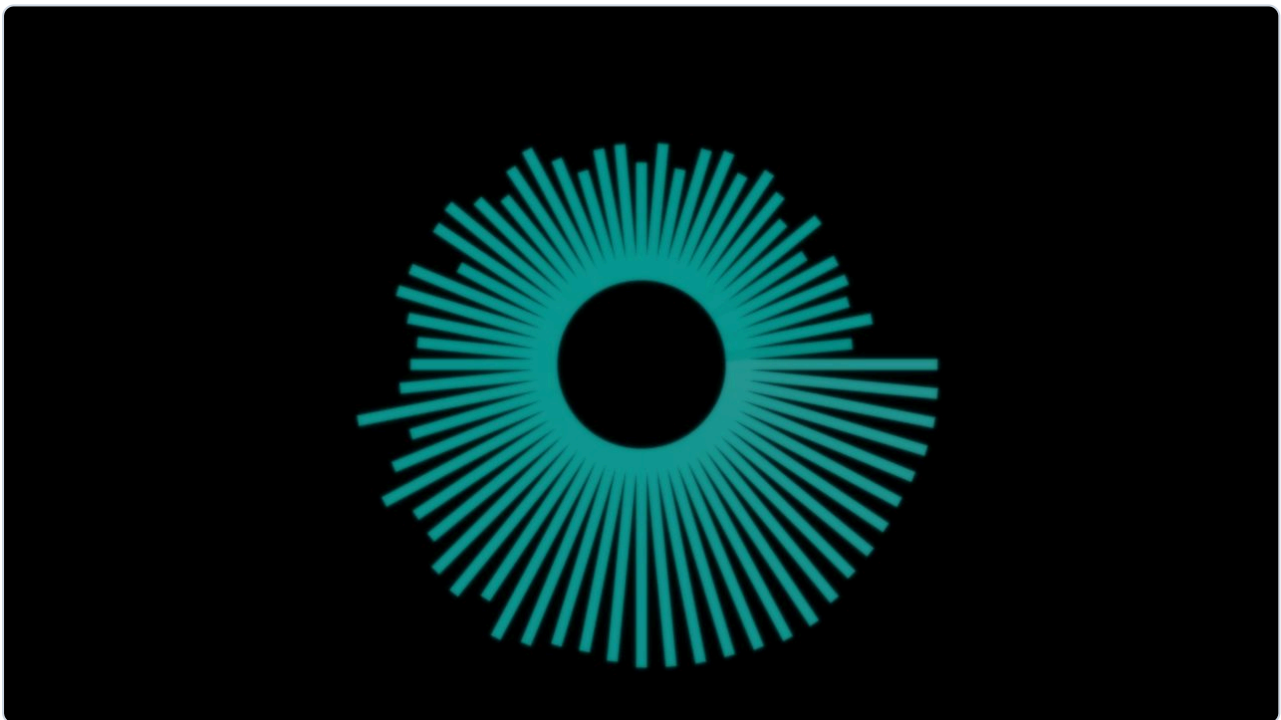
6.1 Pattern Types

0 — SpikyRing (Default)

Lines radiate outward from a center point like a starburst. Each spike represents a frequency band; spike length is proportional to amplitude. Very aggressive, high-energy feel.

- **Best for:** EDM, Techno, high-energy club nights

Try it: Pattern → SpikyRing (0) · Bars → 56 · Color → #FF0000 · Intensity → 1.0.



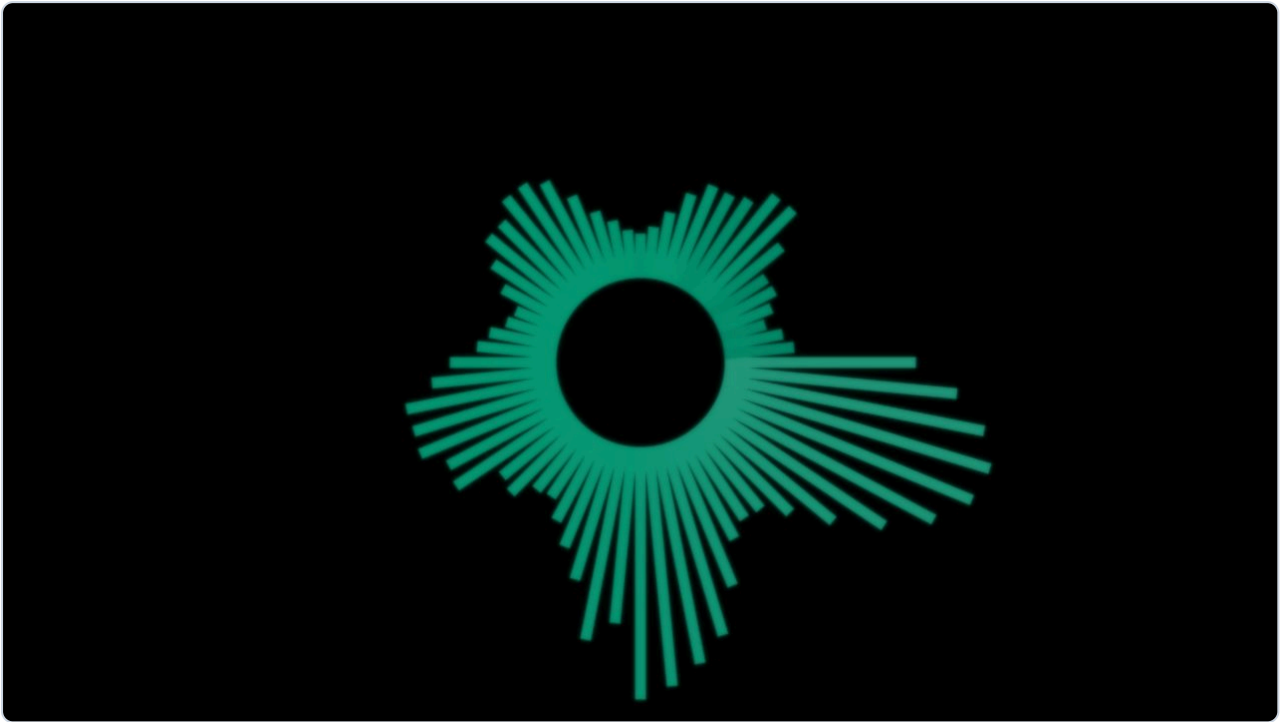
Pattern 0 — SpikyRing. Only the XY visualizer is on in this capture.

1 — WavyRing

A smooth ring with 5 sinusoidal lobes that pulse with the music. Much softer and more fluid than SpikyRing.

- **Best for:** Progressive house, Trance, Ambient, elegant events

Try it: Pattern → WavyRing (1) · Bars → 56 · Color → #00FF00 · Intensity → 0.8.



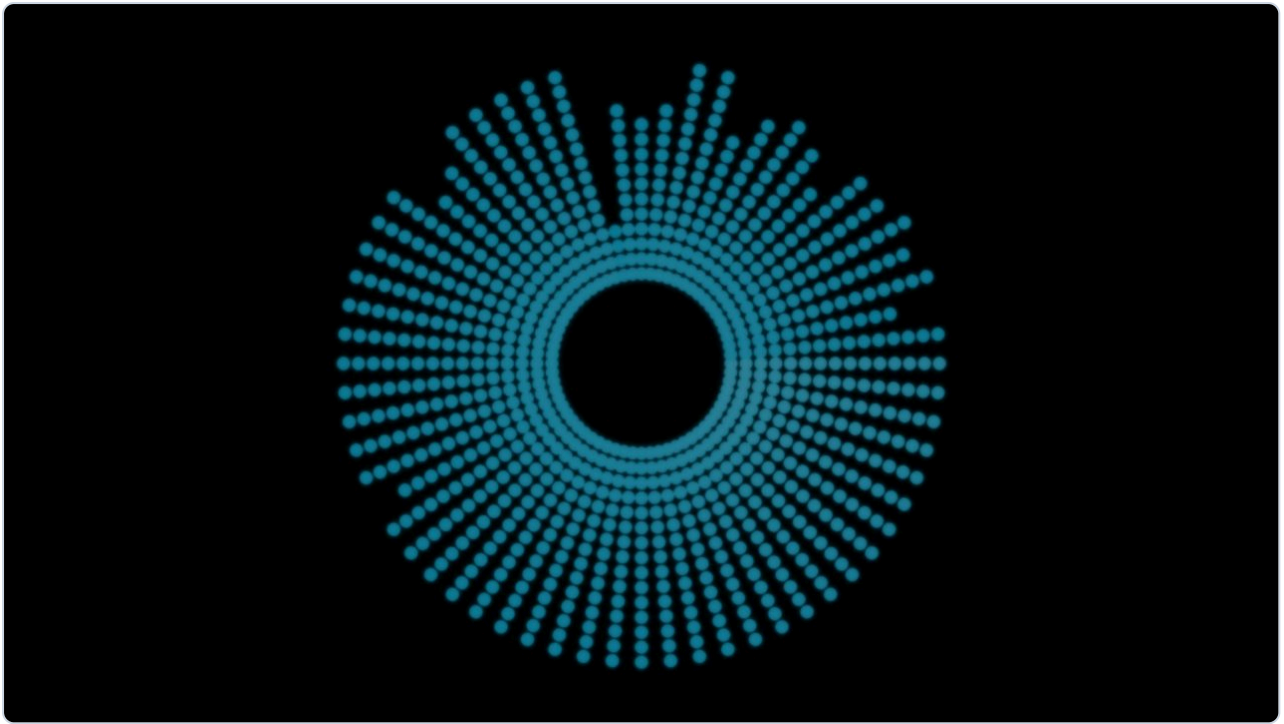
Pattern 1 — WavyRing. Only the XY visualizer is on in this capture.

2 — CircularRing

Small circles are placed radially; each circle's size varies with frequency amplitude, producing a blob-like, organic boundary.

- **Best for:** Ambient, Jazz, artistic projections

Try it: Pattern → CircularRing (2) · Bars → 60 · Color → #0088FF.



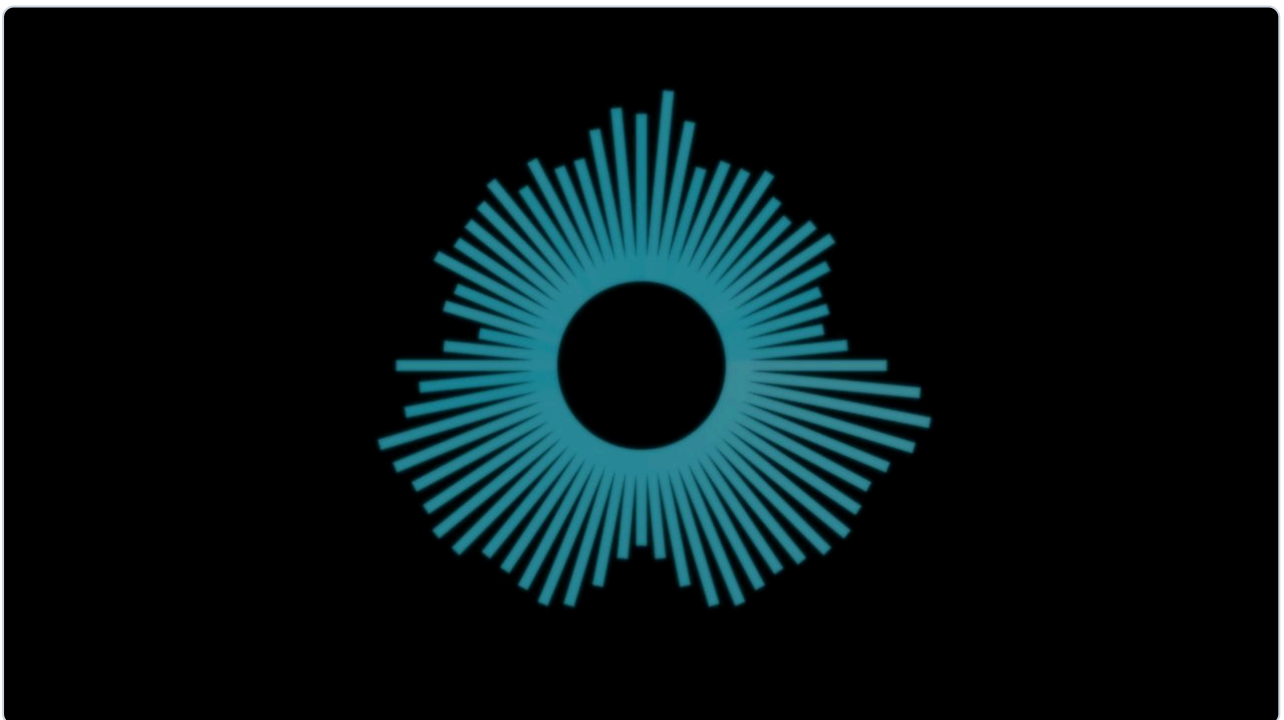
Pattern 2 — CircularRing. Only the XY visualizer is on in this capture.

3 — PlaneRing

A sine-wave based smooth undulation with no sharp edges. Resembles flowing fabric or liquid.

- **Best for:** Chillwave, Vaporwave, Meditation content, subtle background layers

Try it: Pattern → PlaneRing (3) · Bars → 48 · Color → #FF00FF.



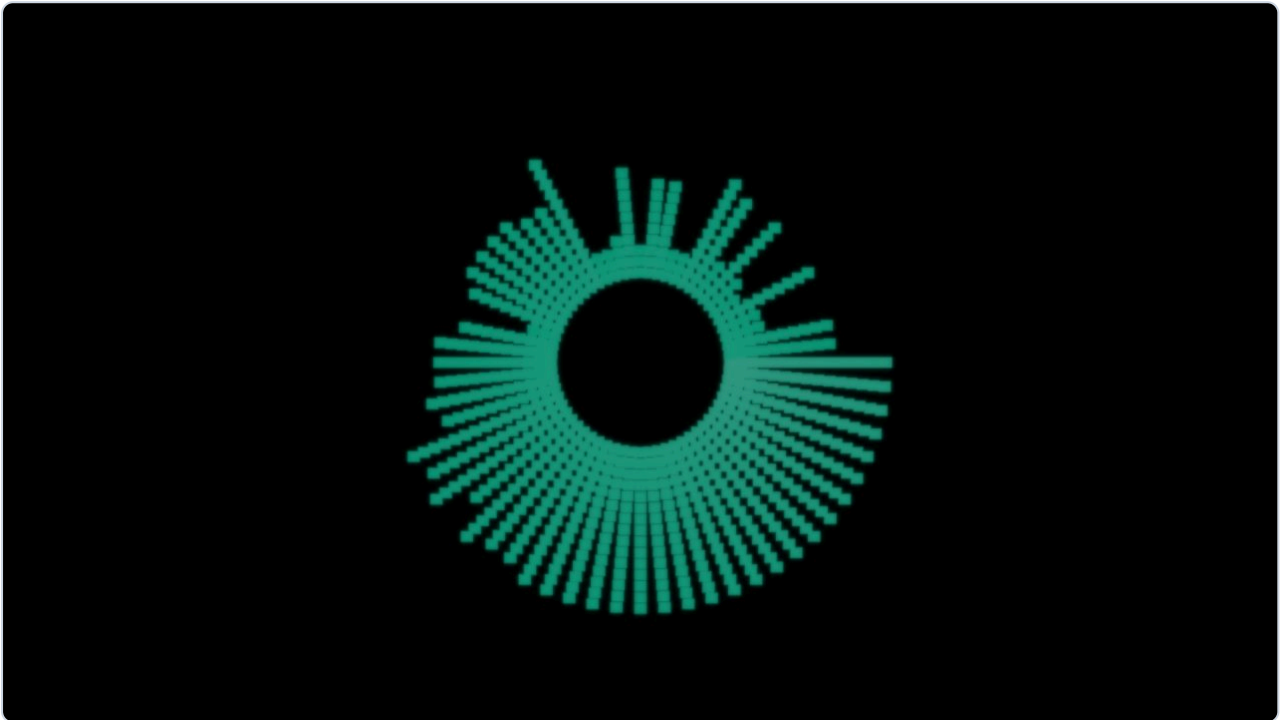
Pattern 3 — PlaneRing. Only the XY visualizer is on in this capture.

4 — DottedRing

A circle of discrete dots; each dot's distance from center scales with amplitude. Gives a modern tech/cyber aesthetic.

- **Best for:** Tech house, Cyberpunk aesthetics, modern electronic events

Try it: Pattern → DottedRing (4) · Bars → 64 · Color → #00FFFF.



Pattern 4 — DottedRing. Only the XY visualizer is on in this capture.

5 — AnalogTripleWave

Three concentric ring layers corresponding to bass (inner), midrange (middle) and treble (outer) frequency bands, color-coded for easy reading.

- **Best for:** Detailed frequency monitoring, educational demonstrations, advanced audio visualization

Try it: Pattern → AnalogTripleWave (5) · Bars → 56 · Color → #FFAA00.



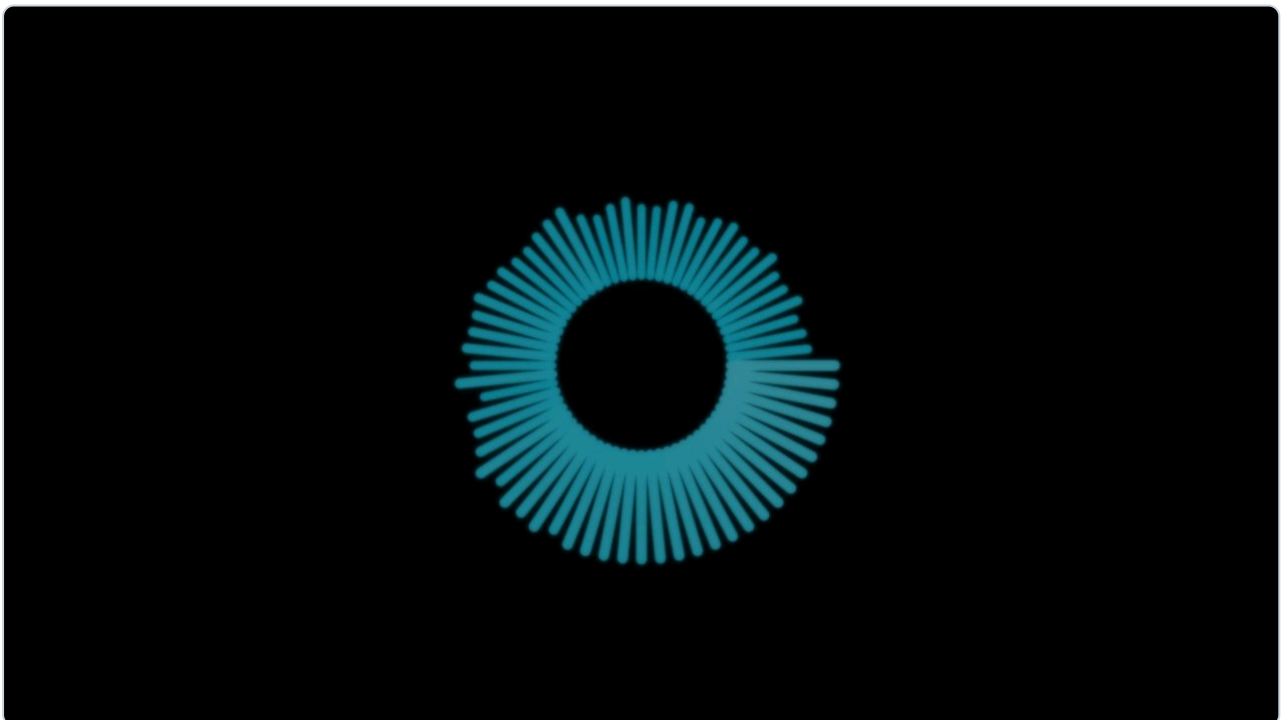
Pattern 5 — AnalogTripleWave. Only the XY visualizer is on in this capture.

6 — NoisyRing

A smooth base ring deformed by a random noise field. Produces water-ripple or plasma-like organic chaos, controlled by `noiseLevel`.

- **Best for:** Glitch/noise music, experimental art installations, unpredictable creative visuals

Try it: Pattern → NoisyRing (6) · Bars → 64 · Color → #AABBFF · Noise level → 0.5.

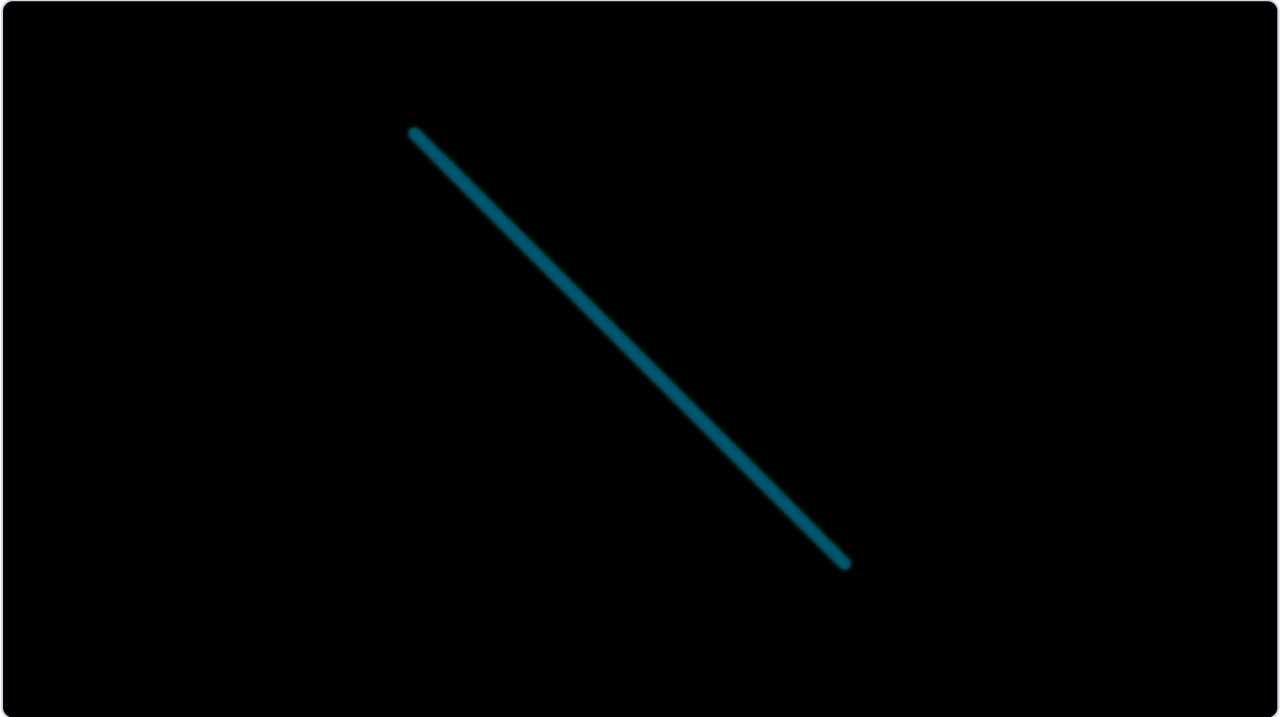


7 — XY Oscilloscope (genuine Lissajous)

True X/Y oscilloscope: plots the left audio channel against the right channel instead of the spectrum ring. Produces classic Lissajous figures that collapse to a diagonal line on mono material and bloom on wide stereo.

- **Best for:** Ambient/IDM, stereo-width checks, hypnotic center visuals

Try it: Pattern → XY Oscilloscope (7) · Color → #00FFCC · Intensity → 1.2. Feed it stereo material — mono collapses.



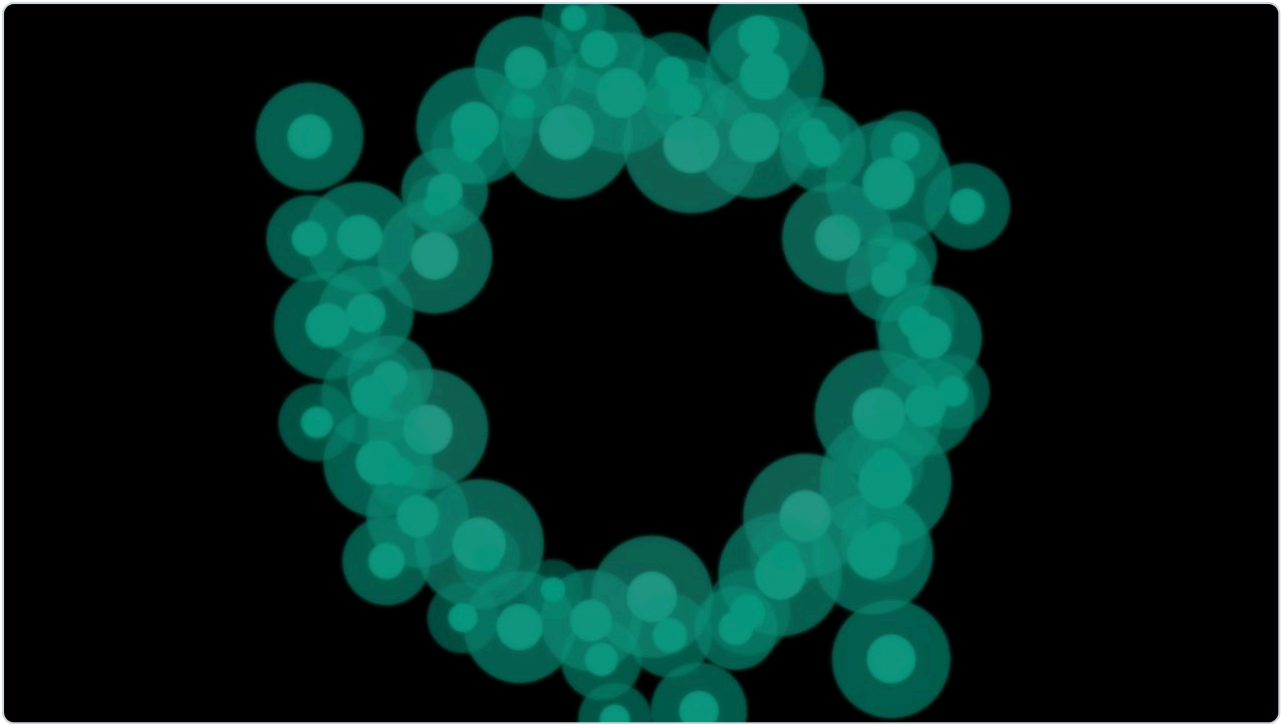
Pattern 7 — XY Oscilloscope (mono material collapses to a diagonal line). Only the XY visualizer is on in this capture.

8 — Galaxy Swirl

Spiral galaxy of particles with a bright pulsing core. Arms rotate around the center; **barCount** drives arm density, **intensity** arm length. The core pulses with the beat.

- **Best for:** Trance/progressive builds, cosmic themes, peak-time euphoria

Try it: Pattern → Galaxy Swirl (8) · Bars → 64 · Color → #AA66FF · Intensity → 1.2.



Pattern 8 — Galaxy Swirl. Only the XY visualizer is on in this capture.

9 — Hyperspace Tunnel

Rings of neon light flying outward in perspective, like a warp tunnel. Depth speed follows the music's energy; color shifts per beat when beat sync is active.

- **Best for:** Psytrance/techno drops, high-speed transitions, finales

Try it: Pattern → Hyperspace Tunnel (9) · Bars → 96 · Color → #00FFFF · Sensitivity → 2.0.



6.2 Settings and properties

Open **Settings** → **Layer - Waveforms** → **XY Visualizer**. The page scrolls: the first half holds the look, the second half the geometry and placement.

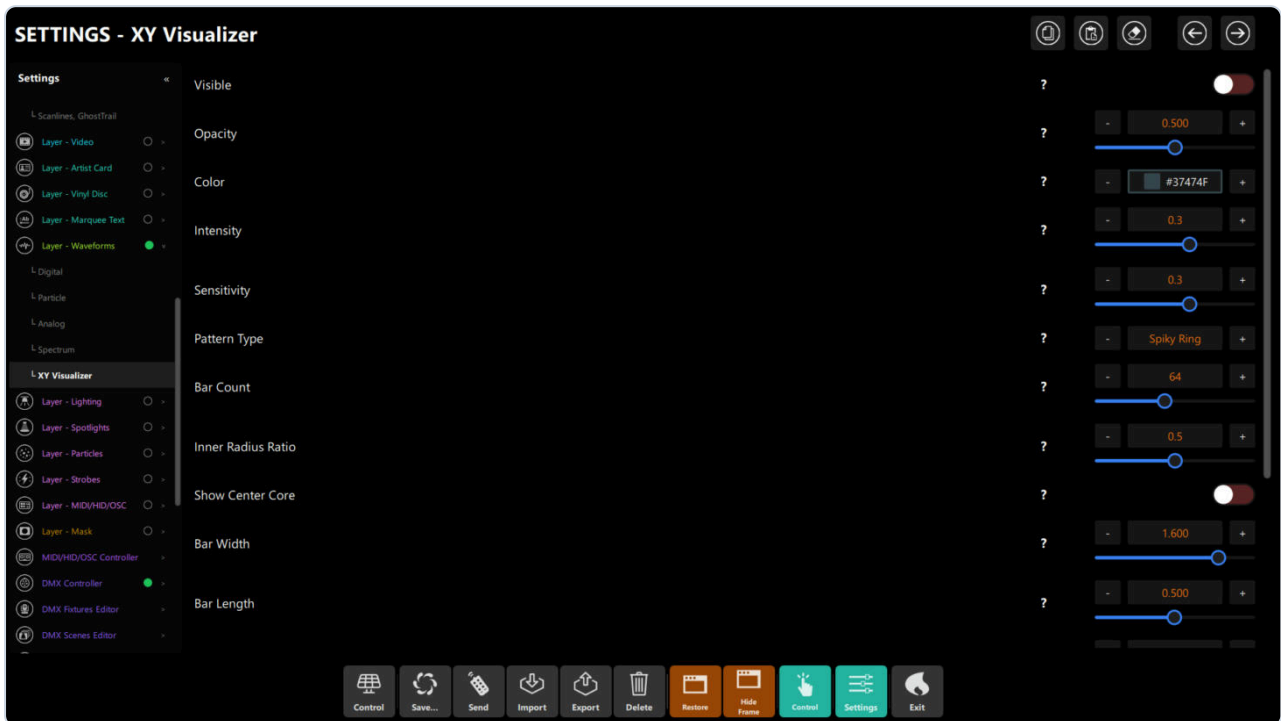


Figure: XY Visualizer settings — Visible, Opacity, Color, Intensity, Sensitivity, Pattern Type, Bar Count, Inner Radius Ratio, Show Center Core, Bar Width and Bar Length.

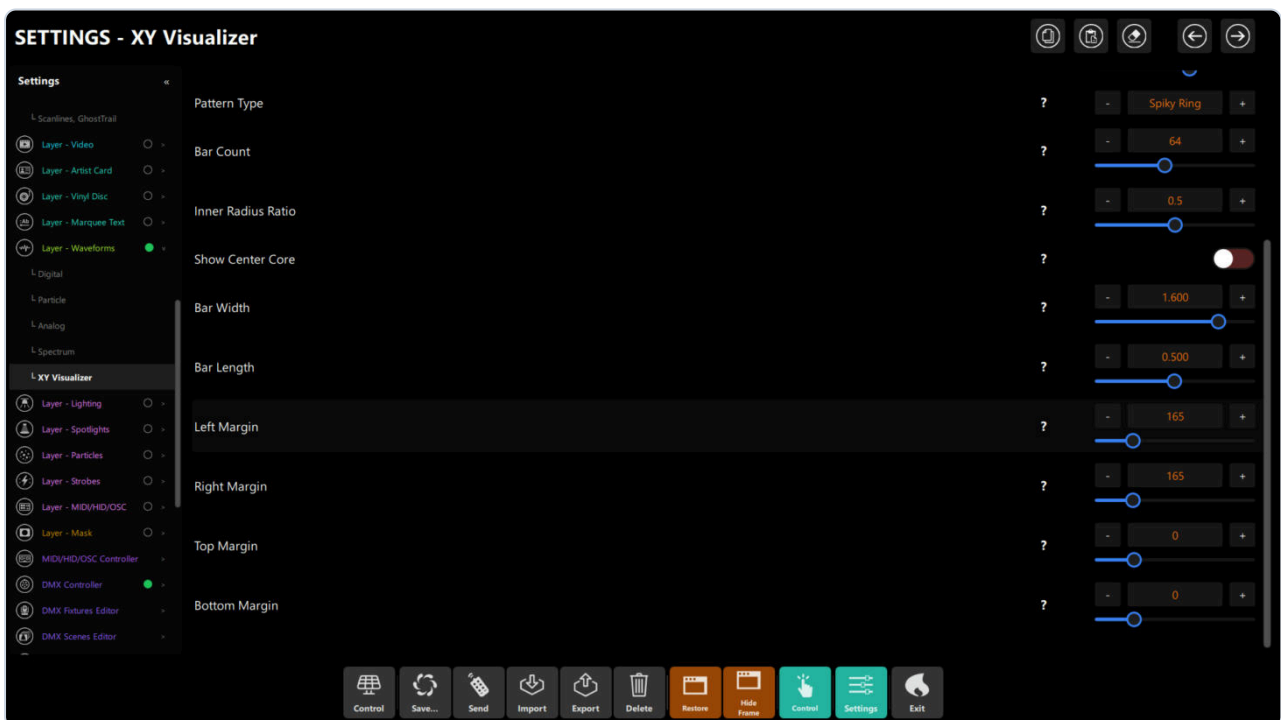


Figure: scrolled to the end — Bar Length and the four margins. XY defaults to a full-screen area (left/right 165, top/bottom 0).

Control	Property	Default	What it does
Visible	<code>visible</code>	off	Shows or hides the visualizer
Opacity	<code>opacity</code>	0.5	Transparency of the whole visualizer
Color	<code>baseColor</code>	<code>#37474F</code>	Primary pattern color (type a hex value and press Apply)
Intensity	<code>intensity</code>	0.3	Overall pattern amplitude
Sensitivity	<code>sensitivity</code>	0.3	Audio reactivity multiplier
Pattern Type	<code>patternType</code>	Spiky Ring (0)	One of the 10 patterns above
Bar Count	<code>barCount</code>	64	Number of frequency bands drawn
Inner Radius Ratio	<code>innerRadiusRatio</code>	0.5	Inner ring size as a fraction of the outer radius
Show Center Core	<code>coreVisible</code>	off	Draws a pulsing core in the middle of the ring
Bar Width	<code>barWidth</code>	1.6	Width of the lines or dots
Bar Length	<code>barLength</code>	0.5	How far bars extend from the ring
Left / Right / Top / Bottom Margin	<code>margins.*</code>	165 / 165 / 0 / 0	Where the visualizer sits, in pixels from each edge

Note

The NoisyRing noise amount, the kaleidoscope segment count and the trail persistence exist in the engine but are not shown in the Settings page of this version; they keep their built-in values.

Chapter 8: Choosing The Right Visualizer

Feature Matrix

Feature	Digital	Particle	Analog	Spectrum	XY / Lissajous
Input type	Frequency bands	Frequency bands	Raw PCM samples	FFT data	FFT spectrum (+ L/R for pattern 7)
Real-time	✓	✓	✓	✓	✓
Pattern variety	1 look	1 look	8 patterns	1 look	10 patterns
GPU demand	Low	Medium	Low-Medium	Low	Medium-High
Artistic potential	Medium	High	High	Medium	Very High
Technical accuracy	High	Low	High	Very High	Medium
Customization	Medium	Medium	High	Medium	Very High
Best primary use	Clear bass/treble bars	Soft background texture	Oscilloscope / DJ trace	Frequency analysis	Stage visuals

Visual Style Matrix

Visualizer	Energy Feel	Tech/Professional	Artistic/Creative
Digital	★★★★☆	★★★★☆	★★★☆☆
Particle	★★★☆☆	★★★☆☆	★★★★☆
Analog	★★★★☆	★★★★☆	★★★★☆
Spectrum	★★★☆☆	★★★★★	★★★☆☆
XY / Lissajous	★★★★★	★★★★☆	★★★★★

Chapter 9: Performance And Graphics Load

Graphics load varies by visualizer, settings, output resolution, other layers and hardware. The relative ranking below is a rough guide, not a frame-rate promise or a benchmark.

Rank	Visualizer	Relative GPU Cost	Notes
🥇 1st	Digital	Low	A row of bars; scales with Bar Count
🥈 2nd	Spectrum	Low	Mirrored bars; scales with BarCount
🥉 3rd	Analog	Low–Medium	Simple Line is cheapest; MultiLine, Waveform and Tri-Band are heavier
4th	Particle	Medium	Particle emitters cost more than plain bars
5th	XY / Lissajous	Medium–High	Circular math is costliest; Galaxy Swirl and Hyperspace Tunnel draw the most

Optimization Tips

💡 Tip

Limited graphics headroom: Start with one visualizer, then add layers gradually. A Digital or Spectrum visualizer with fewer bars is a reasonable starting point.

💡 Tip

More headroom: Try additional visualizers or more bars, then check the output on the actual show display.

- Reduce the number of bars or switch to a simpler pattern if motion looks uneven.
- Disable visualizers and effects that are not part of the current composition.
- Test at the same screen resolution and with the same media you plan to use live.

Chapter 10: Recommended Combos Per Event Type

9.1 Club night / EDM

Role	Visualizer	Configuration
Main focal point	XY — AnalogTripleWave	Choose Pattern Type: AnalogTripleWave , a contrasting color and about 64 bars
Background energy	Analog — Area	Choose Pattern: Area , an orange color and reduced opacity
Frequency detail	Spectrum	Start around 64 bars and use a coordinated accent color

Start with the XY visualizer by itself. Add the other two only if the screen stays clear and rendering remains smooth.

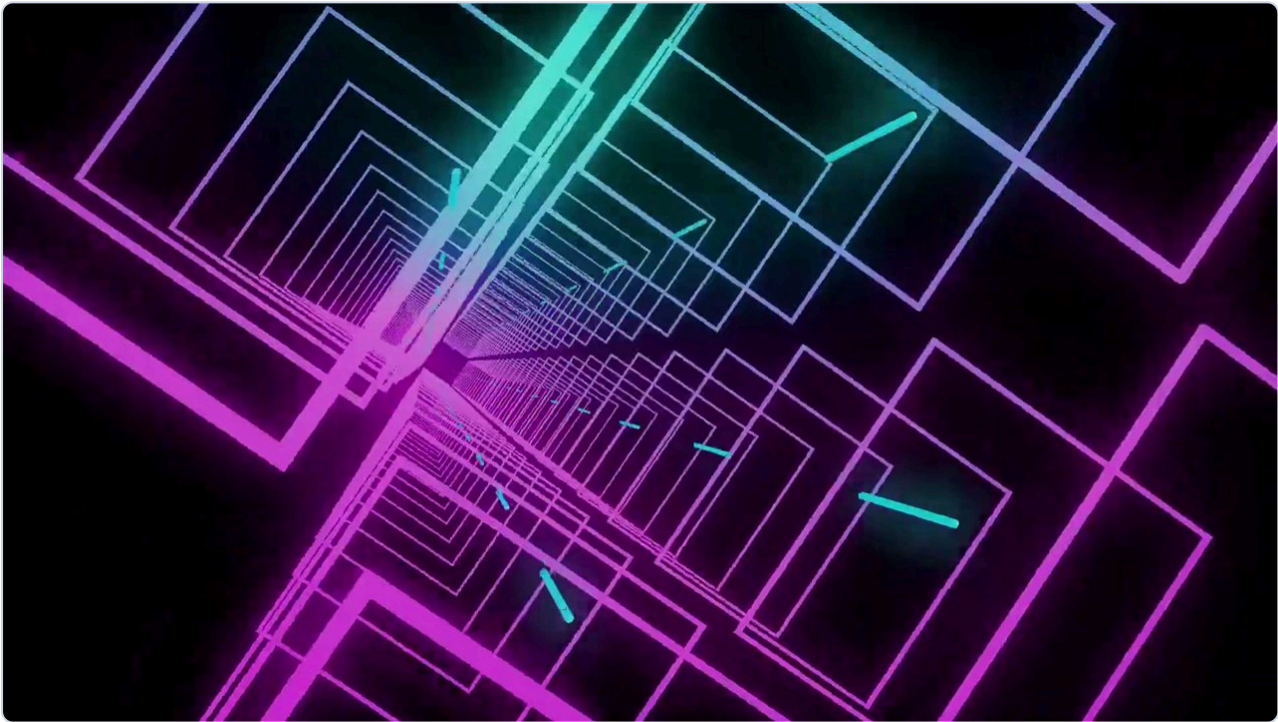




Figure 2: club-night frames — neon, laser and strobe looks, all audio-reactive.

9.2 Corporate / brand event

Clean, controlled, professional — must never distract from the presenter.

Role	Visualizer	Configuration
Ambient background	Analog — Gradient	Use a muted brand color and modest intensity
Level reference	Digital	Use a single high-contrast color and a low opacity so the bars stay unobtrusive
Subtle frequency view	Spectrum	Start with about 32 bars and a restrained color

Note

For corporate events, keep the visualizers subtle and use soft, desaturated brand colors so they do not compete with the presenter.

9.3 Broadcast / Livestream

Technical accuracy is paramount — viewers need to read the visualizers clearly on compressed video streams.

Role	Visualizer	Configuration
Frequency view	Spectrum	Use a readable bar count and high-contrast color
Level monitoring	Digital	Watch the bars; their color does not change automatically at a threshold
Signal view	Analog — Tri-Band	Shows the bass, mid and treble content of the signal at a glance

These visualizers help inspect the signal; they do not replace the meters in your audio system or broadcast loudness/compliance tools.

9.4 Artistic / Gallery / Experimental

Prioritize aesthetics and uniqueness over technical accuracy.

Role	Visualizer	Configuration
Central artwork	XY — NoisyRing	Choose the NoisyRing pattern and a cool accent color
Complementary layer	Analog — Gradient	Choose a contrasting color and lower its opacity
Depth layer	Analog — MultiLine	Use a thinner line and subtle opacity

Tip

Add layers gradually and lower opacity when details begin to obscure one another.

Chapter 11: Live Control Without Code

The visualizer controls are available in Settings. Depending on your setup, selected controls can also be mapped to a controller or changed through show automation.

10.1 Sliders and Color Pickers

Try it: In Settings, drag the Intensity slider and pick a color — the visual updates live.

10.2 Evolving Motion Over Time

Try it: change **Intensity** or **Bar Width** slowly during a long breakdown instead of switching patterns, and check the result on the output display.

10.3 Rotating Patterns During Long Sets

Try it: Change the XY pattern between songs for variety. If you use controller pads, map pattern selection to a pad and rehearse it first.

10.4 Dynamic HTTP API Control

For live control from scripts, use the versioned `PATCH /api/v1/config` API and the actual configuration properties for the selected visualizer. For example, this turns on the XY visualizer and selects Galaxy Swirl:

```
curl -X PATCH http://127.0.0.1:8080/api/v1/config -H "Content-Type: application/json" \
-d '{"elements":{"waveFormView":{"xyVisualizer":{"visible":true,"patternType":8}}}}'
```

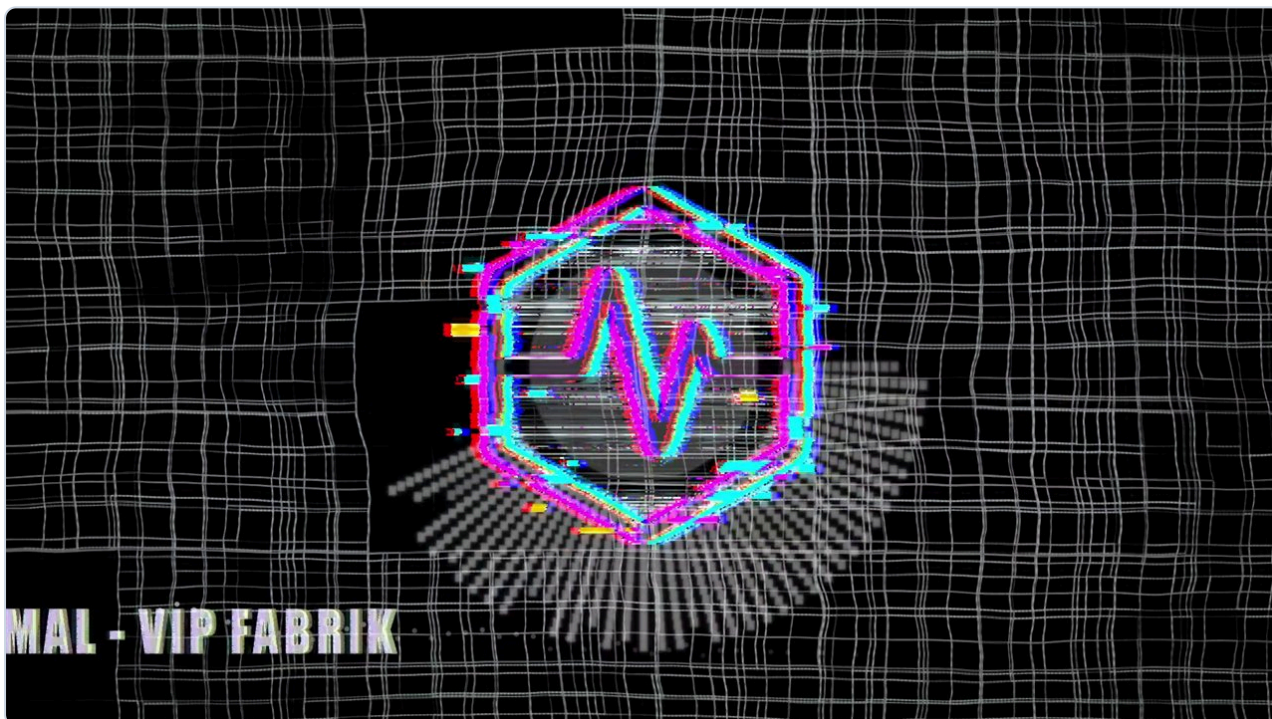
The Analog visualizer takes `patternType` 0–7 and the XY visualizer 0–9, in the order shown in this guide. The complete API guide explains how to start the server, authenticate and apply partial config changes: [HTTP & WebSocket API](#). Confirm the property path for your visualizer before sending a change; a generic example property may not correspond to the live app.

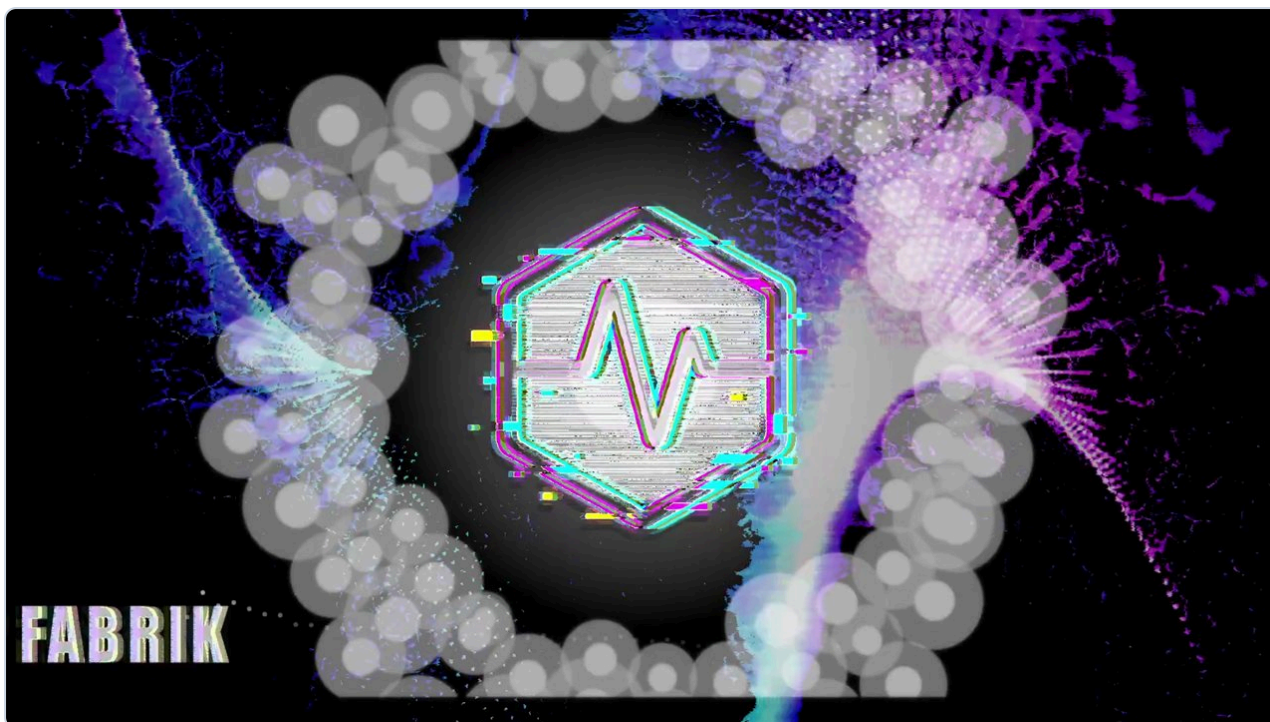
Chapter 12: Summary & Quick-Reference Table



Figure 3: promoter artwork composited live over the reactive bed.







Same logo, four beds — the overlay stays put while the background changes the mood.

Visualizer	Config key (<code>elements.waveFormView...</code>)	Input	Patterns	GPU	Top Use Case
Digital	<code>waveformVisualizer</code>	Frequency bands	1	Low	Clear bass/treble bars
Particle	<code>particleWaveVisualizer</code>	Frequency bands	1	Medium	Soft background texture
Analog	<code>analogWaveVisualizer</code>	PCM samples	8	Low–Medium	Oscilloscope / DJ-style trace
Spectrum	<code>spectrumVisualizer</code>	FFT data	1	Low	Frequency analysis
XY / Lissajous	<code>xyVisualizer</code>	FFT spectrum (+ L/R for pattern 7)	10	Med–High	Main stage visual

💡 Tip

Start with the **Feature Matrix** in Chapter 7 to identify which visualizer fits your event type, then consult **Chapter 9** for a ready-to-use combo that matches your scenario.