

Audio Setup & Beat Sync

Devices, Silence & Ableton Link

This guide gets reliable audio into DjMirror Pulse and the beat grid out: capture devices with fallback, input volume, video-audio routing, the silence detector, and Ableton Link clock modes. Ten minutes here prevents an entire night of dead or jittery visuals.

DjMirror Pulse User Manual Series

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Related guides: beat-driven layers are covered in [Layers, Shaders & FX](#) and timecode shows in [Timecode Shows](#).
For technical detail see [docs audio/README CONFIGURE AUDIO INPUT](#) and [docs audio/README SILENCE STATES GUIDE](#); the app's own help is under **Settings** → **Help** → **Audio Analysis**.

Chapter 1: The Example Setup

Piece	Setting	Value for tonight
Main device	Settings → AUDIO Device → Main Audio Device	Mixer USB out (or system loopback on same laptop)
Fallback device	Fallback Audio Device	Built-in mic / second interface
Level	Capture Input Volume (0.0–2.0)	~1.0, meters dancing mid-scale
Silence	Settings → FX - General (Silence Threshold / Frames / Cooldown / Energy Threshold)	Defaults first, tune per venue
Beat grid	Ableton Link panel (Pro/Enterprise)	Audio analysis default; Link modes when a Link peer exists

Chapter 2: Concepts In Two Minutes

- **The app chooses the device for you, in a fixed order.** It looks for the **Main** device by its exact name; if it is missing it tries the **Fallback** by exact name, then any device whose name contains the fallback's name, and finally the first device the system lists. This check runs again whenever the list of audio devices changes, so plugging the main device back in returns the app to it. Your **Main** setting is never overwritten by a fallback.
- **Volume is gain, not a fader. Capture Input Volume** (0.0–2.0, step 0.01) scales the captured signal before analysis. Too low = sleepy visuals; pinned at max = everything fires constantly.
- **Silence is a state machine** (none → detecting → confirmed → ongoing), driven by four controls: threshold (0.01–0.90), frames 3–12 (default 6, about 270 ms), cooldown 500–3000 ms and energy threshold 0.15–0.50 (default 0.25).
- **Two beat sources.** Audio-peak analysis (always available) and the Ableton Link grid (LAN peers: Traktor, Live, Resolume). Clock-source modes decide which leads; a beat policy decides how they combine.
- **Link settings are saved outside `config.json`** (in the operating-system settings, group **AbletonLink**), so they survive a `config.json` reset but not a full settings reset. Timecode is *not* a beat source: cues fire actions at positions (see the [Timecode guide](#)).

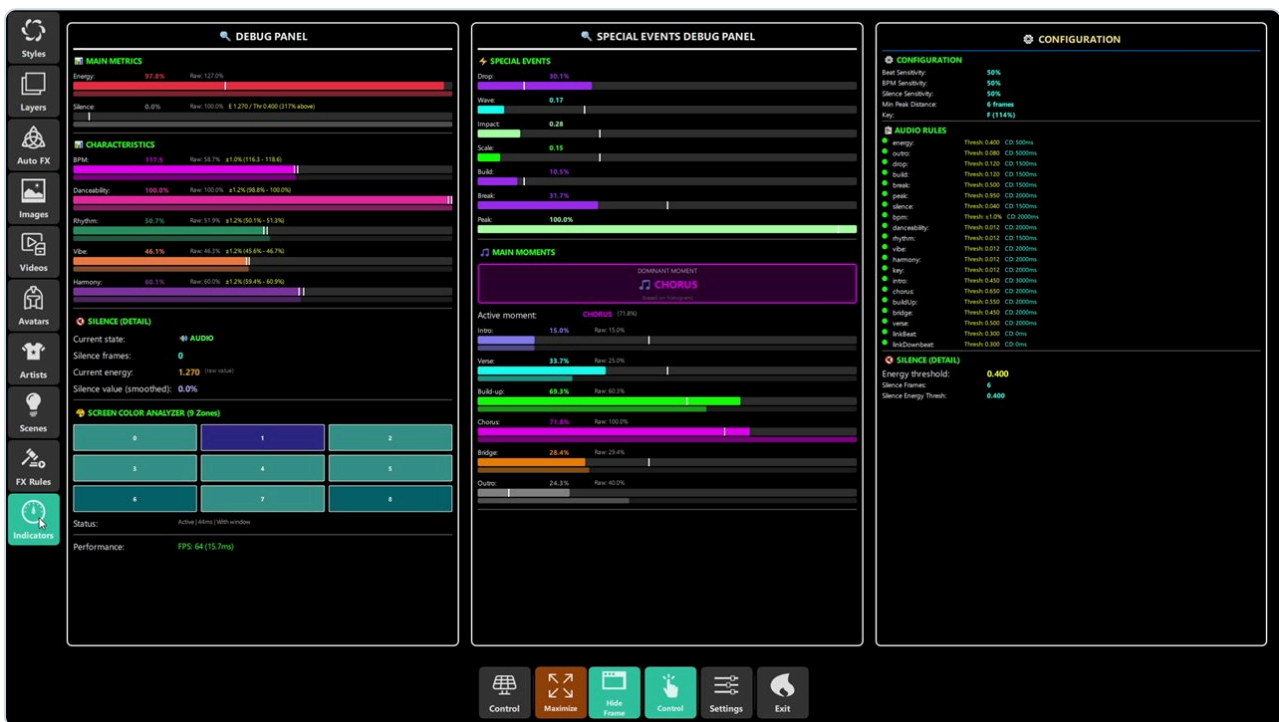


Figure 1: the Indicators debug panel — live detector values, silence state and the 9-zone analyzer in one view.

Chapter 3: Step By Step

Step 1 – Main + fallback devices (2 min)

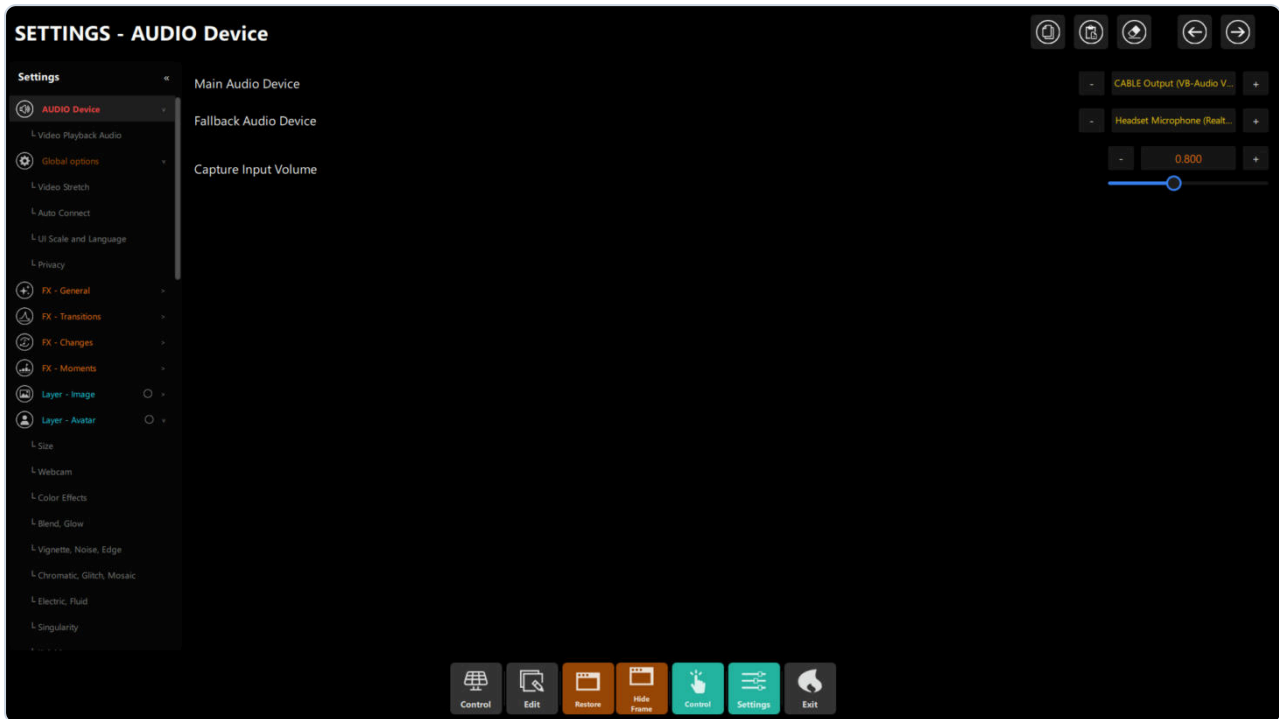


Figure 2: Settings → AUDIO Device — Main and Fallback devices (step through the list with – and +) and the Capture Input Volume. The sub-page **Video Playback Audio** sits under it.

1. **Settings → AUDIO Device.** Set **Main Audio Device** to the mix source.
2. Set **Fallback Audio Device** to anything else available. If the main vanishes mid-show, the app fails over instead of going silent. Test once: unplug the main, watch the meters continue on the fallback, then replug it and check the app returns to the main device.

Step 2 – Level (2 min)

Play music at show volume. Set **Capture Input Volume** (it starts at 0.8) so peak meters dance around 60–80 %: about 1.0 is typical for a mixer USB feed; laptop loopback often needs more. Confirm on the Waveforms layer — a healthy waveform fills without flattening at the rails.

Step 3 – Video audio and stretch (1 min)

- **Settings → AUDIO Device → Video Playback Audio:** turn it on and choose the output device — only if show audio comes from played videos. By default it is off and uses the system default output.
- **Settings → Global options → Video Stretch:** Crop / Fit / Stretch for the projector's aspect ratio.

Step 4 – Silence detector (3 min, per venue)

Defaults work for recorded music; live rooms need tuning. The four silence controls are in **Settings → FX - General** (the same detector grid is on the touch panel's **FX Rules** section):

Control	Range	Meaning
Silence Threshold	0.01–0.90	Sensitivity of the silence rule; see the symptom table below for which way to move it
Silence Frames	3–12 (default 6)	How many consecutive quiet frames confirm silence
Silence Coldown	500–3000 ms	Minimum time between silence events
Silence Energy Threshold	0.15–0.50 (default 0.25)	Energy below which a confirmed silence is validated

Play a track, stop it, and watch the Silence indicator:

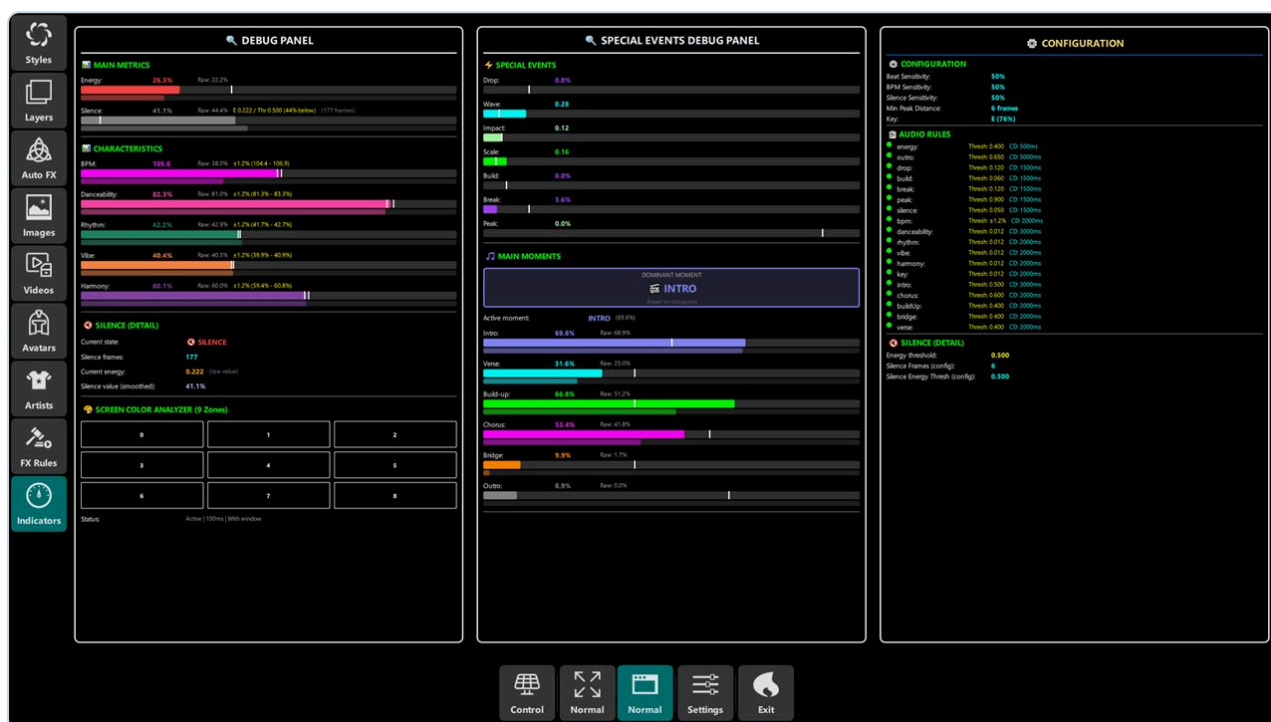


Figure 3: a tuned detector holding silence — DMX and FX rest with it.

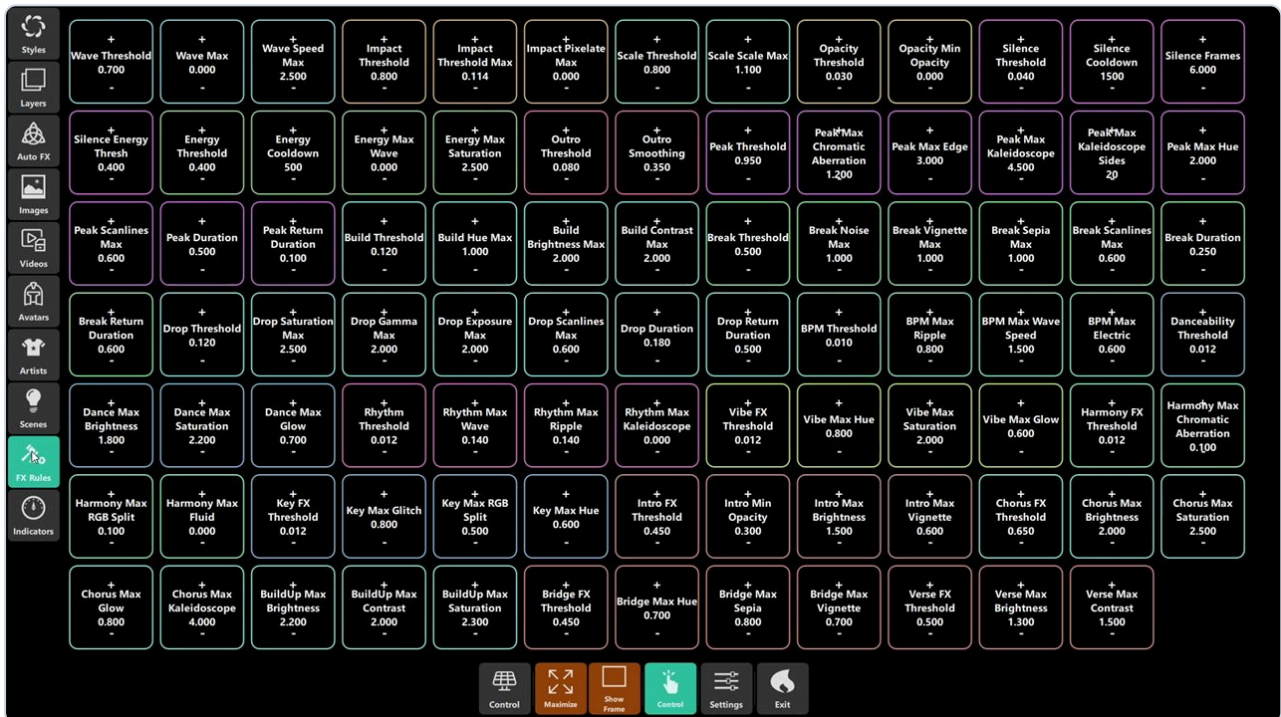
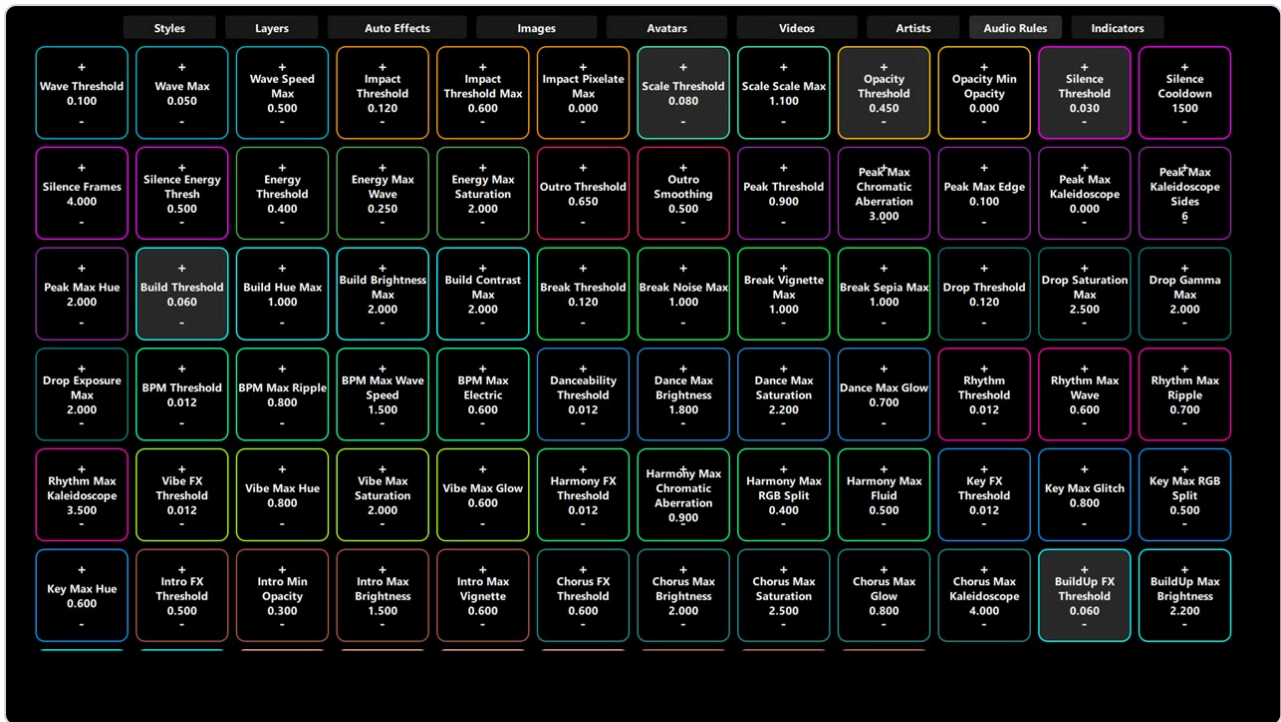


Figure 4: the same detector grid in Settings and on the touch panel.

Symptom	Fix
Triggers during quiet breakdowns	Raise Silence Frames / lower Silence Threshold
Never triggers between tracks	Lower frames / raise sensitivity
Flickers on/off	Raise Silence Cooldown

This detector also drives DMX silence behavior and FX gating — one tuning serves all three.

Step 5 – Ableton Link (Pro/Enterprise, only with Link peers)

1. Enable Ableton Link in the DJ/VJ app and keep both devices on the **same local network**. Allow DjMirror Pulse through the OS firewall if it cannot see the other app.
2. In DjMirror Pulse, open **Settings** → **Ableton Link**, switch on **Link active**, and wait for **Connected • N peers**. The panel also shows the session BPM and bar position.
3. Choose the **Clock source**:
 - **Audio analysis (default)**: audio supplies tempo and beats; Link only supplies grid signals.
 - **Link only**: Link supplies tempo and beats; audio tempo/beat analysis is disabled while connected.
 - **Link primary, audio fallback**: Link supplies tempo; beats follow the selected beat policy, and audio takes over if the Link session is lost.
 - **Audio primary, Link grid**: audio supplies tempo and beats; Link supplies the grid and reports tempo mismatches.
4. The **Beat policy** is shown for **Link primary** only: **Link grid only**, **Audio peaks only**, **Audio peak confirmed by the grid (AND)**, or **Either, no double firing (OR)**. These options determine how audio peaks and Link grid beats combine; they do not apply to every clock source.
5. In **Beat sync**, use **Mark downbeat** to make the nearest Link beat the local bar beat 1. **Mark phrase start** sets the local phrase anchor; it does not change the shared Link session. The panel shows the current bar and beat relative to that anchor.
6. The **Effect tempo** multiplier ($\times \frac{1}{4}$, $\times \frac{1}{2}$, $\times 1$, $\times 2$, $\times 4$) changes the tempo used by beat-driven effects only; it does not change the Link session BPM or the displayed session tempo.
7. Other controls appear only when they make sense for the chosen clock source:

Control	Range / default	Shown for	What it does
Beats per bar	1–32, default 4	Always	Length of a bar on the Link grid
Phase offset	in ms (positive = beats fire earlier)	Always	Nudges the beat to match what you hear
Bar offset (beats)	in beats	Always	Moves which beat is counted as beat 1
Mark phrase start / Automatic start	—	Always	Sets the phrase anchor by hand, or returns to the automatic anchor (the bar where the session was joined)
Alignment window	10–200 ms, default 50	Link primary with the AND or OR policy	How close an audio peak must be to a grid beat to count as the same beat
Tempo smoothing	0–1000 ms, default 150	Link only, Link primary	Smooths tempo changes from the session
<i>Link beats also trigger the classic beat signal (drives DMX strobes on drops)</i>	On by default	Link only, Link primary	Lets Link beats drive the same signal as audio beats
<i>Use audio analysis when no other Link app is in the session</i>	On by default	Link only	Falls back to audio while you are alone in the session
<i>Keep emitting Link beats while the audio input is silent</i>	On by default	Always	Keeps the beat grid running between tracks

The status line reads **Disabled, Waiting for other Link apps...**, **Another Link app found in a separate session: joining...** or **Connected · N peers**. The first time you enable Link, the operating system may ask you to allow DjMirror Pulse on the local network: Link uses UDP multicast, so every app must be on the same network.

Link and beat-clock settings persist in the `QSettings` `AbletonLink` group, not in `config.json`. They survive application restarts, but a full settings reset clears them.

Power-user configuration (no UI): `elements.beatSync.beatPulse` (`source: audio|grid`, `gridEvent: beat|downbeat|division`, `divisionsPerBeat`, default 2) and `layerPulse` (attack/decay beats and per-layer scale/brightness/glow amounts).

Note

Ableton Link is not part of every build: the panel says *Not available in this build* when the Link SDK is missing, and the Mac App Store build leaves Link out because of the store's sandbox rules.

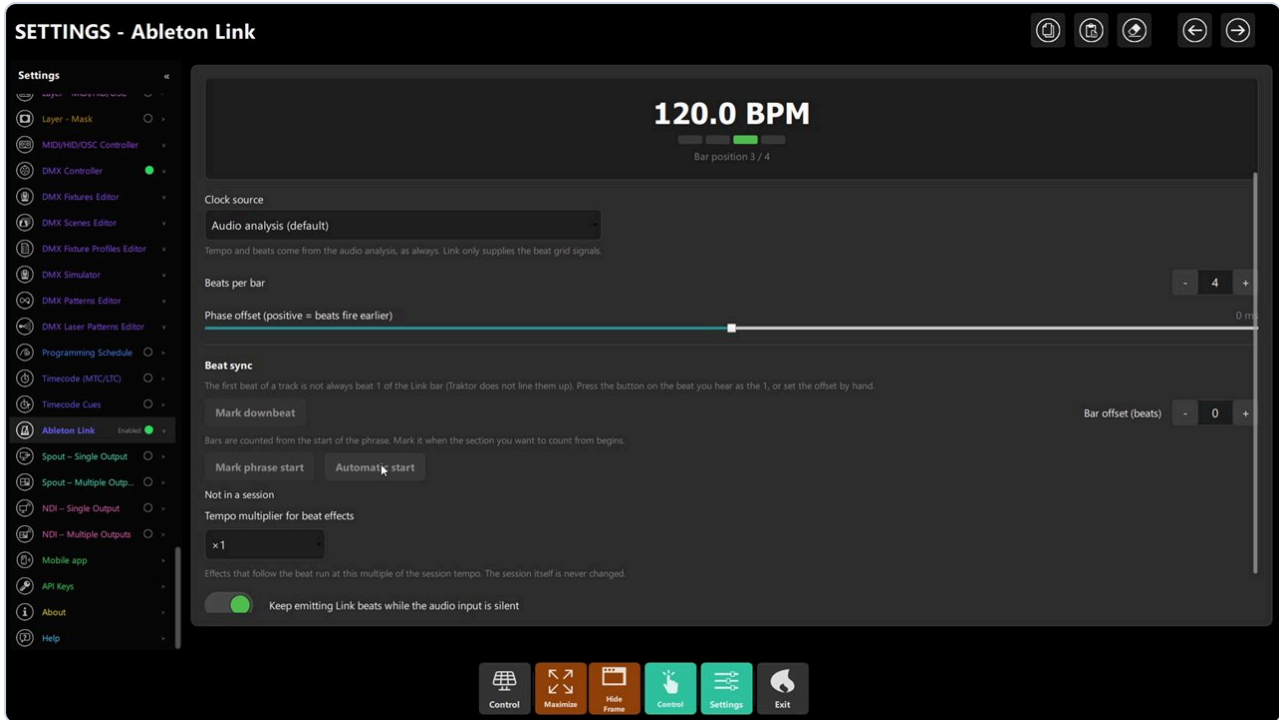


Figure 5: clock source, beats per bar, phase offset and the Mark downbeat controls.

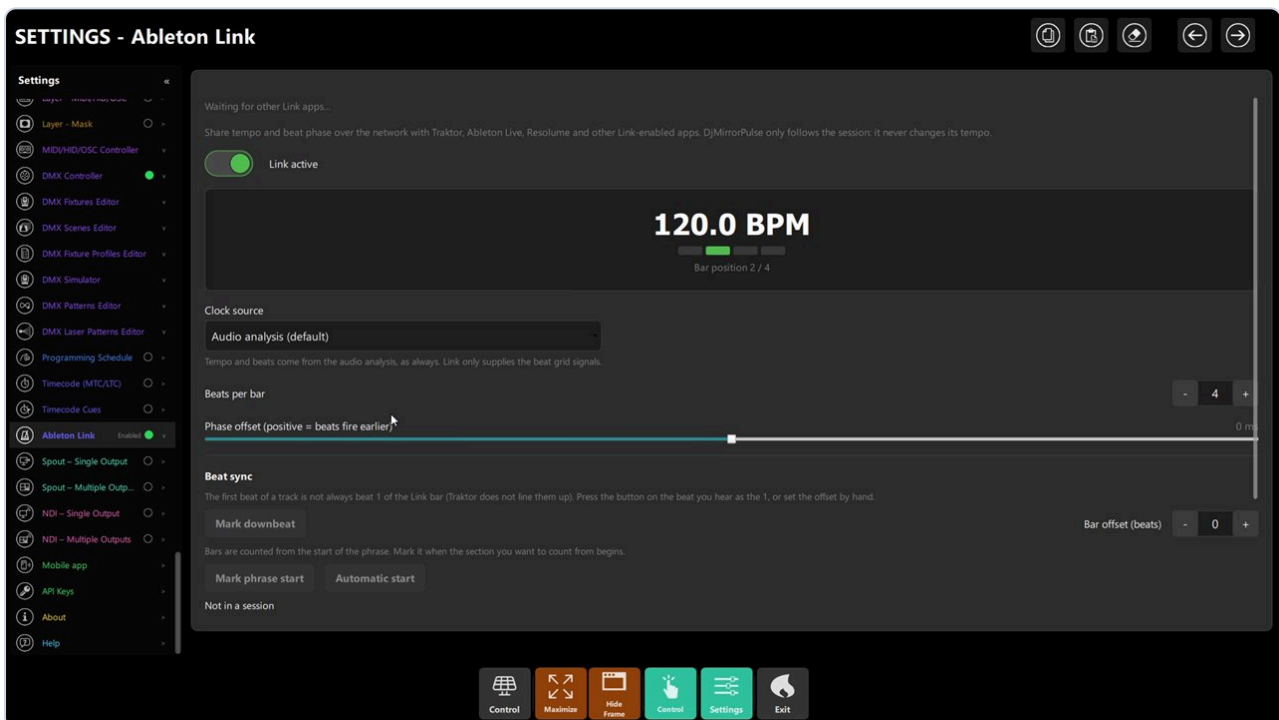


Figure 6: session status, 120 BPM and bar position — follow-only, the tempo is never changed.

Beat Pulse & Layer Pulse (v1.0.0.730+)

Beat Pulse (`elements.beatSync.beatPulse`): drives visualizers on grid events.

- **source**: `audio|grid` — source of beat events (default `audio`)
- **gridEvent**: `beat|downbeat|division` — which grid event fires (default `beat`); **divisionsPerBeat** (default 2) sets how many `division` events fall in a beat

- **layerPulse** (per-layer): attack/decay in effect beats (defaults 0.1 / 0.3), scale/brightness/glow amounts (defaults 0.04 / 0.15 / 0.2) per listed layer (always grid — no **source** field; disabled until layers are listed)

Mark downbeat / phrase (MCP/API): **markDownbeat** sets the local bar downbeat; **beatAnchor** (**mode: mark|clear**) marks the phrase start or returns to the automatic anchor. Neither changes the shared Link session.

Chapter 4: Pre-Show Checklist (2 Min)

1. Main device = mix source, fallback set, unplug test passed.
2. Meters at 60–80 % on show-volume music.
3. Silence indicator: on with music stopped, off with music playing.
4. Link (if used): peer count > 0, grid LED blinking with the DJ's tempo.

Chapter 5: Troubleshooting

Symptom	Likely cause	Fix
Meters dead	Wrong device / volume ~0 / OS input muted	Reselect Main device; volume ~1.0; OS sound settings
Everything fires constantly	Input clipping	Lower capture volume / OS input level
Silence flickers	Cooldown too short / threshold on the edge	Raise cooldown; move threshold away from room noise floor
Link peers not seen	Different Wi-Fi / firewall UDP	Same LAN, allow Link UDP; wired preferred
Panel says <i>Not available in this build</i>	The build has no Link SDK, or it is the Mac App Store build	Use a build that includes Link
Status stays on <i>Waiting for other Link apps...</i>	No other Link app is running or it is on another network	Enable Link in the other app; same network
Beat double-fires	AND/OR policy mismatch	Use Either, no double firing (OR)
Settings lost after config wipe	Link lives in QSettings	Re-set Link panel after any settings reset

Chapter 6: Quick Recipe Card

- Main + fallback devices → unplug test. Volume ~1.0 → meters 60–80 %.
- Video-audio only if videos carry the show. Stretch: Crop/Fit/Stretch.
- Silence per venue: frames/threshold/energy/cooldown; one tuning feeds DMX + FX.
- Link: clock source + beat policy; peers on same LAN; QSettings-persisted.