

## Swarm — User Manual

**Swarm** is an audio effect plugin that takes care of one difficult thing: making your tracks get out of each other's way, all by themselves. Drop one instance of Swarm on each track, link them together, and they form a swarm that self-regulates in real time. The mix breathes and balances itself, without you automating EQs or sidechains.

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### In two sentences

Every Swarm instance watches its own track (where it sits in the spectrum, whether it is loud or quiet, where it is in the stereo field). All instances in the same group then talk to each other in real time through shared memory, ask each other “where are you at?”, and each one subtly adjusts its own EQ, gain and pan so the whole stays coherent and clear.

The result: a mix that regulates itself. Colliding frequencies move apart. Levels come together. All of it without you touching a single automation lane.

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## Installation

### macOS

1. Download **Swarm-1.0.0-macOS.dmg**.
2. Open the **.dmg** and double-click the **.pkg**.
3. If macOS blocks the installation (unsigned installer):
  - Right-click (or Ctrl-click) the **.pkg**
  - Choose “Open”
  - Confirm in the dialog
4. The plugin installs into **~/Library/Audio/Plug-Ins/** (VST3, CLAP and AU).
5. Restart your DAW and rescan your plugins.

### Windows

#### With the installer (recommended)

1. Download **XeniAudio-Swarm-V1.0.0-Installer.exe**.
2. Run it and follow the steps. Windows SmartScreen may warn you that the publisher is unknown (the installer is unsigned): click “More info”, then “Run anyway”.
3. The installer places the plugins in the standard locations:
  - VST3 → **C:\Program Files\Common Files\VST3\**
  - CLAP → **C:\Program Files\Common Files\CLAP\Swarm\**
4. Restart your DAW and rescan your plugins.

The installer registers an entry in “Apps & features”, so Swarm can be removed from Windows Settings like any other application.

### Manual install (portable ZIP)

1. Download `Swarm-1.0.0-Windows.zip`.
2. Extract the archive.
3. Copy the contents of the `VST3` and `CLAP` folders into the locations your DAW scans (typically `C:\Program Files\Common Files\VST3\` and `C:\Program Files\Common Files\CLAP\`).
4. Restart your DAW and rescan your plugins.

### Linux

1. Download `Swarm-1.0.0-Linux.tar.gz`.
  2. Extract the archive.
  3. Copy `Swarm.vst3` into `~/.vst3/` and `Swarm.clap` into `~/.clap/`.
  4. Restart your DAW and rescan your plugins.
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### Quick start — 3 steps

1. **Insert one instance of Swarm on each track** you want in the swarm (for example: guitar, vocals, bass, keys, drums).
2. **Give every instance the same Link Slot.** In each plugin window, set “Link Slot” to the same number (0 by default). Every instance sharing a slot forms one swarm. You can run several swarms in the same mix (slot 0 for the rhythm section, slot 1 for the vocals, and so on).
3. **Raise Intensity.** Set it to 100% to begin with. You will hear the swarm come alive: clashing frequencies move apart, levels converge, the stereo image opens up. If the effect is too strong, lower Intensity. If you want it more pronounced, push it beyond 100% (up to 300% for an extreme effect).

That’s it. Everything else is optional.

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### The four forces — what Swarm does

Swarm applies four rules, each adjustable independently. Think of them as four invisible assistants, each looking after one aspect of the mix.

#### Separation — spectral separation

When two tracks step on each other in the same frequency range (say, a guitar and a keyboard fighting over 2 kHz), Separation gently pulls one back and pushes

the other forward, so they make room for each other. It is the equivalent of a dynamic EQ, except you never have to say *where* to cut: the swarm decides on its own, in real time, based on what the other tracks are playing.

### Alignment — level alignment

Alignment helps tracks settle at a common level and move together. When one track jumps in volume, the others gently follow. This is the “groove” of the mix. Alignment is not aggressive compression: it adjusts each track’s gain very subtly so the whole holds together, like a band of musicians listening and adapting to each other in real time.

### Cohesion — tonal cohesion

Cohesion gently pulls each track’s timbre towards a shared centre of gravity. If one track is very bright and another very dark, Cohesion brings them closer without flattening them out — each track keeps its identity, but the whole sounds coherent. A dead zone protects the extremes (a big bass will not suddenly turn bright).

### Pan Spread — stereo separation

Pan Spread pushes apart tracks that are piling up in the same spot of the stereo image. Guitar to the left, keys to the right — without you touching a pan control. It is **mono-compatible**: no phase colouration, no delay. If you want a track to stay dead centre (drums, bass, kick), enable “Pin Center” on that instance and it will be excluded from the stereo motion.

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## The main controls

| Control           | What it does                                                                                                   | Tip                                                 |
|-------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| <b>Intensity</b>  | The overall strength of the swarm.<br>Drop to 0% to disable everything.<br>Push to 300% for an extreme effect. | Start at 100%. This is your master swarm level.     |
| <b>Separation</b> | The weight of spectral separation (anti-masking).                                                              | If two tracks are stepping on each other, raise it. |

| Control           | What it does                                                                         | Tip                                                            |
|-------------------|--------------------------------------------------------------------------------------|----------------------------------------------------------------|
| <b>Alignment</b>  | The weight of level alignment.                                                       | Light by default (20%). Too strong and the mix loses dynamics. |
| <b>Cohesion</b>   | The weight of tonal cohesion.                                                        | 50% by default. A good balance between identity and coherence. |
| <b>Pan Spread</b> | The weight of stereo separation.                                                     | 30% by default. Raise it for a wider mix.                      |
| <b>Reactivity</b> | How fast the swarm reacts. At 0% it is glacially slow. At 100% it reacts bar by bar. | 50% is the original setting, validated on three mixes.         |

## Advanced controls

### Crest — the transient designer

The **Crest** knob works on the track's transients. It analyses the difference between the peaks (attacks) and the body of the signal, then adjusts each instance's dynamics.

- **Positive Crest** ( $> 0$ ): boosts the attacks, adds punch.
- **Negative Crest** ( $< 0$ ): densifies the signal, flattens the peaks.
- **Crest Spread**: distributes punch across the swarm. A track with a lot of punch nudges the others into leaving room for it.

**Important:** Crest needs at least 8 dB of dynamic range to work properly. If your track is already heavily compressed (less than 8 dB of crest), the knob greys out — that is expected, there is nothing left to sculpt.

### Pin Center — lock to the centre

Enable “Pin Center” on tracks that must stay in the middle of the stereo image: drums, bass, kick. Those tracks are excluded from Pan Spread's motion.

### Link Slot — grouping instances

Every instance sharing the same Link Slot number forms one swarm. By default everyone is on slot 0. Change the number to create separate groups.

### Link Params — synchronising settings

Enable “Link Params” so that every instance in a given Link Slot shares the same force settings — all 8 bars: Intensity, Separation, Alignment, Cohesion, Pan Spread, Reactivity, Crest and Crest Spread. When you change a setting on one instance, all the others in the same group inherit it. This is handy when you want to steer the whole swarm from a single window, without opening every instance.

Pin Center, Bypass and Link Slot stay **local** to each instance, even when Link Params is on.

**Link Params is a group switch.** Clicking it on *any* instance turns it on — or off — for the whole Link Slot at once. You do not need to enable it on each instance, and you cannot have some instances linked and others not within the same slot.

**Turn it off when you want per-track control.** Intensity is one of the shared settings, so while Link Params is on, every track yields to the swarm by exactly the same amount. That makes it impossible to give one track priority over another — see the next section.

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### Setting priority — which track wins

Swarm has no leader. No instance is in charge, and none of them negotiates on behalf of the others. So how do you tell it that the kick matters more than the bass?

**You set priority with Intensity, per instance.**

Intensity scales the forces applied **to that instance only**. What an instance publishes to the swarm — where it sits in the spectrum, its level, its pan, its crest — does not depend on its own Intensity at all. So an instance at low Intensity yields less, while still pushing everyone else exactly as hard.

Take that to the limit and you get an anchor:

**Intensity at 0% on the kick makes it a pure anchor.** The swarm never moves it, and it still moves everything else. Keep the instance loaded — that is what feeds the kick’s position into the swarm.

That is the whole mechanism. There is no leader flag because you do not need one: **priority is simply who yields**. Give the tracks that must stay put a low

Intensity, and the tracks that can move a high one.

Remember that Intensity is shared when Link Params is on. **Turn Link Params off before setting priority**, otherwise every track gets the same value and nothing can take precedence.

### Recipe: kick and bass

This is the hardest pair in any mix, because the two genuinely overlap exactly where Separation pushes hardest.

| Track | Intensity | Pin Center | Why                                         |
|-------|-----------|------------|---------------------------------------------|
| Kick  | 0-30%     | On         | Stays put, keeps the low end anchored       |
| Bass  | 100%+     | Off        | Does the moving, gets out of the kick's way |

If it still sounds busy, **lower Reactivity on the bass**. Lower is slower. Most of what people hear as two tracks “fighting” is simply the two of them moving at each other faster than the music does.

And if you would rather they never interact at all, put them in different Link Slots.

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## The interface — what you see

Swarm’s interface is designed to be readable at a glance, even while you are mixing.

### The feature space (the big central area)

This is Swarm’s signature. Each instance is drawn as a glowing dot in a graph. The horizontal axis shows where the track sits in the spectrum (left = lows, right = highs). The vertical axis shows its level (higher = louder).

- The orange dot is **you** (the instance you have open).
- The other coloured dots are the **other instances** in the swarm.
- The dashed orange line is the swarm’s **centre of gravity**.
- The trails behind the dots show their **trajectories**: you can see where they are heading.

During playback the dots move in real time. If you see two nearby dots drifting apart, that is Separation at work. If a dot rises or falls to join the others, that is Alignment. It is fascinating to watch, and it tells you immediately what the swarm is doing.

## The force bars

In front of the feature space you will see 8 coloured horizontal lines. Each one is a control. Click and drag vertically to adjust the value. Double-click to reset to the default. Use the mouse wheel for fine adjustment.

When “Link Params” is on, an orange halo surrounds all 8 bars — every one of them is shared across the group.

## The flock legend

To the right of Pin Center / Link Slot / Link Params you will find one row per instance in your swarm, each with the colour of its dot in the feature space. It answers the question the graph alone cannot: **which dot is which track?**

Hover a row and that instance’s dot gets a ring in the feature space, while the panel below shows exactly what the swarm is applying to it. The rows never move, so there is nothing to chase with the mouse.

## The action panel — what the swarm is actually doing

Just below the three buttons, four bars show the corrections being applied **right now**:

| Bar         | What it shows                                                              |
|-------------|----------------------------------------------------------------------------|
| <b>EQ</b>   | The 3-band tilt, in dB. Positive lifts the highs, negative lifts the lows. |
| <b>GAIN</b> | The level correction from Alignment, in dB.                                |
| <b>PAN</b>  | The stereo displacement from Pan Spread.                                   |
| <b>TRAN</b> | The transient shaping from Crest, in dB.                                   |

Each bar fills from the centre, and the colours match the forces that produce them — so a moving red bar means Separation and Cohesion are working, a green one means Alignment is.

By default the panel shows **your** track, with an orange strip down its left edge. Hover a row in the flock legend and it switches to that instance, the strip taking the colour of its dot. This is how you check what Swarm is doing to a track without opening its window.

When nothing is playing every bar sits at zero: silent tracks leave the swarm, and a swarm with nothing to arrange applies nothing.

## Presets

The preset selector at the top right offers 5 ready-made settings:

- **Init** — everything at default, a neutral starting point.

- **Subtle** — the swarm works gently, almost invisibly. Ideal for a mix that is already good and just needs finishing.
- **Wild** — the swarm off the leash: intensity at 220%, fast reaction, wide spectrum. For an obvious effect.
- **Spectral Only** — only spectral separation and tonal cohesion are active. Alignment and Pan at zero.
- **Spatial Only** — only Pan Spread is active. For widening a mix without touching the spectrum.

You can save your own presets, compare them (A/B), and undo/redo your changes (20 levels).

### The meter bar (at the bottom)

Five small horizontal meters give you a technical overview: **IN** (input level), **OUT** (output level), **GR** (gain reduction applied by the swarm), **Crest** (the track's dynamic range), and **LUFS** (perceived level, BS.1770 standard, over 3 seconds).

### The help bar (right at the bottom)

Hover any control with the mouse and an explanation appears at the bottom of the window. It tells you what that control does, in plain language.

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## Licensing and demo mode

Swarm runs in **demo** mode until you activate it. In demo mode the sound is muted for 5 seconds every 60 seconds (with fades, to avoid clicks). Everything else works normally: you can try every feature and save your settings.

Every demo instance mutes at **the same moment**, so the mix drops out as a whole and comes back as a whole. That way you can still judge how the swarm balances your tracks against each other — which is the whole point of trying it. Offline bounces are unaffected by this and keep the usual cadence.

To activate Swarm:

1. Click the “DEMO” badge at the top right.
2. Enter your license key (format **XENI-XXXXXXX-XXXXXXX**, or a Gumroad key).
3. Click “Activate”.

You can also paste your key with the “Paste” button or the keyboard shortcut (Ctrl+V / Cmd+V).

Once activated, the DEMO badge disappears and the sound is no longer muted.

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## Mixing tips with Swarm

- **Start light.** Set Intensity to 50% and work your way up. Swarm is subtle by nature — you may not notice it working until you switch it off and the mix falls apart.
  - **Fewer instances is sometimes better.** Swarm speaks more clearly with 4 to 8 instances than with 20. If the mix sounds confused, reduce the number of tracks in the swarm.
  - **Bypass and compare.** The BYPASS button at the top right lets you hear the before/after instantly.
  - **Pin your centre elements.** Drums, bass, kick: enable “Pin Center” so they stay in the middle of the stereo image.
  - **Anchor what must not move.** Drop Intensity to 0% on your kick and it becomes a fixed reference the rest of the swarm arranges itself around. See “Setting priority” above.
  - **Crest needs air.** If a track is already heavily compressed, leave Crest at 0 — the knob greys out anyway.
  - **Link Params to audition, not to mix.** Turning it on lets you dial the whole swarm from one window, which is ideal for finding a starting point. Turn it back off to give individual tracks priority — while it is on, every track yields by the same amount.
  - **Watch the action panel when in doubt.** If you are not sure Swarm is doing anything, hover the tracks in the flock legend and read the four bars. It is faster than soloing.
  - **Save your settings.** Find a sound you like, save it as a preset, and compare it against other configurations.
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## Supported formats

- **VST3** — Windows, Linux, macOS
- **CLAP** — Windows, Linux, macOS
- **AU** (Audio Unit) — macOS only (Logic Pro, GarageBand, etc.)

On macOS the plugin is **universal**: it runs on both Intel Macs and Apple Silicon Macs (M1, M2, M3...).

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## Known limitations

- **Reaper (Windows, VST3):** window resizing does not work in Reaper with the VST3 build. Use the CLAP version instead.
- **Stereo only.** Swarm works in stereo (2 in, 2 out). There is no mono or surround mode.
- **LUFs over 3 seconds.** The LUFs meter shows the average perceived level over a 3-second sliding window (BS.1770 short-term standard). It is

not the integrated LUFS of the whole track.

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## **Support**

Website: <https://xeni-audio.com>

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