PhotonDSP

GammaDelay

User Manual

Product Version	**1.1.5**
Platform	**Windows x64**
Format	**VST3**

Professional guide to installation, configuration, and safe operation

photondsp.com

© 2026 PhotonDSP. All rights reserved.

Contents

01 Product Overview
02 Installation and First Launch
03 Quick Start
04 Signal Flow
05 Main Controls
06 Advanced Processing
07 Analysis, Monitoring, and Output
08 Presets
09 Trial and Activation
10 Practical Setup

1. Product Overview

GammaDelay is a feature-rich stereo delay with intelligent UNMASK and flexible width control.

`Classic, Dual, and Ping Pong with Flow support regular, triplet, and dotted divisions. Additional effects range from soft spatial repeats to radical sound design.`

With a single control, Tape Simulation transforms a clean digital delay from warm analog repeats into worn, chewed-up tape running through a broken tape machine. Detune and Haas control the width of Wet only, while UNMASK clears conflicting frequencies for Dry.

2. Installation and First Launch

VST3 Installation

The standard plug-in location in Windows is:

```
C:\Program Files\Common Files\VST3\PhotonDSP\PhotonDSP GammaDelay.vst3
```

After installation, refresh the plug-in list in your DAW. GammaDelay appears among the effects from PhotonDSP.

Mono and Stereo Tracks

GammaDelay detects the actual channel configuration provided by the DAW. In some DAWs, a warning appears when the plug-in is inserted on a single-channel mono track.

Identical L and R signals are not considered a mono configuration: mono audio on a stereo track remains a valid stereo input for the plug-in.

GammaDelay can widen a mono source when inserted on a stereo track. For correct operation of Dual, Ping Pong, Flow, Detune, and Haas, use a stereo channel layout or move the source audio to a stereo track.

The warning is shown once for the current instance and blocks the dimmed controls until it is acknowledged.

3. Quick Start

1. Select Classic, Dual, or Ping Pong.
2. In Tempo mode, select the duration with the Rate control. For a free delay time, enable MS. Alternatively, tap TAP several times and the system will detect the tempo automatically.
3. Adjust Feedback to control the number and duration of the repeats.
4. Keep Mix near 50% when the plug-in is inserted directly on an audio track. On a send/return, 100% Wet is usually more convenient.
5. Shape the repeat range with the global HP and LP filters.
6. Add character in small amounts using the effects.
7. If the delay interferes with the source, create space using UNMASK.
8. Monitor the output meter. Reduce Gain when necessary (recommended). Use AutoGain only as an auxiliary option, and do not use it for the final render.

For your first session, choose a suitable preset and change one module at a time. Some effects are inside the feedback loop and become stronger with each repeat, so their result depends not only on the control position but also on Feedback.

The CLEAN IN/OUT factory state uses Classic, Tempo 1/4, the 1x division, Feedback at 75%, fully open HP/LP filters, Color at the center, Mix at 50%, and zero depth for the additional effects. For inactive UNMASK, Selectivity is stored at 4 and Release at 500 ms. Output Gain is 0 dB, while Bypass and AutoGain are disabled.

4. Signal Flow

The input is split into two paths:

- **Dry remains the original signal and reaches the final mixer without delay-effect processing.**
- **Wet enters the delay engine, passes through the repeat chain, and is then mixed with Dry.**

Simplified Wet-path sequence:

1. Delay buffer and the selected delay mode.
2. Tape playback processes.
3. Inside the feedback loop: Shifter → Squeeze → Diffusion → Wash → Feedback, followed by tape recording processes before the signal returns to the buffer.
4. At the Wet output: Ping Pong/Flow panning, Mod → Drive → Haas → UNMASK → Color → Detune → global HP/LP.
5. Mix → Tape Noise → AutoGain → Gain → output meter.

This architecture explains the differences between the modules:

- **Squeeze, Diffusion, Wash, and Shifter alter subsequent generations of repeats because they participate in the feedback loop.**
- **Shifter, Diffusion, and Wash also produce an audible result on the first repeat.**
- **Mod, Drive, Haas, UNMASK, Color, Detune, and the global HP/LP filters process the completed Wet signal and do not alter Dry.**
- **Drive is intentionally excluded from the feedback return, allowing saturation to be added without uncontrolled self-oscillation.**

5. Main Controls

Delay Mode

Classic

A conventional stereo delay. The left and right channels use one base time while preserving the input stereo image. This is the most predictable mode for vocals, instruments, and rhythmic repeats.

Dual

The left channel uses the main Rate time, while the right channel uses its Dual Ratio multiplier. Different delay times create a more complex rhythm and natural stereo width.

Dual Ratio is active only in Dual mode. Values below 1 make the right repeat shorter than the main delay, while values above 1 make it longer. At very high ratios, some right-channel repeats may fall between beats and noticeably change the groove.

Ping Pong

Repeats alternate between the left and right channels. Side changes are smoothed to reduce clicks. For the full effect, both the track and the plug-in bus must be stereo.

Flow

In Ping Pong mode, the Flow button replaces Crossfeed in the UI. Instead of moving discretely from one channel to the other, Wet glides smoothly across the stereo field. The motion is continuous and rounded; the opposite channel never disappears completely, keeping the image steadier and softer.

Flow works well for pads, atmospheric parts, and long tails. On short percussive signals, standard Ping Pong usually produces a more distinct rhythm.

Crossfeed

Available in Classic and Dual. Part of the left-channel feedback returns to the right channel, and part of the right-channel feedback returns to the left. This is not conventional panning and does not swap the Dry channels; it changes the routing of subsequent repeats.

Crossfeed helps connect the two channels into a single stereo loop. With a pronounced Dual Ratio, the result can become rhythmically denser, so monitor Feedback.

Delay Time

Tempo

The delay synchronizes to the project BPM. The available base Rate values are:

`1/32`, `1/16`, `1/8`, `1/4`, `1/2`, `1/1`, `2/1`, `4/1`, `8/1`.

Additional buttons modify the selected division:

- **1x — regular duration;**
- **Trip — triplet: the duration is two-thirds of the regular division;**
- **Dot — dotted note: the duration is one and a half times the regular division.**

Example: 1/4 + Trip produces a quarter-note triplet, while 1/4 + Dot produces a dotted quarter note. Trip and Dot are alternatives and are not combined.

MS

Free delay time in milliseconds. The control range is logarithmic: shorter times allow finer adjustment, while longer delays occupy less of the control travel.

The 1x / Trip / Dot buttons do not apply in MS mode and are shown as inactive.

When switching between Tempo and MS, GammaDelay converts the current time to the nearest equivalent value. In Tempo mode, the result is quantized to an available musical division.

TAP

Press TAP several times at the desired rhythm. GammaDelay analyzes the latest intervals, smooths minor timing inaccuracies, and rejects clearly accidental taps.

- In MS mode, TAP applies the measured interval directly.
- In Tempo mode, TAP selects the nearest combination of Rate and 1x/Trip/Dot based on the project BPM.

For a stable result, use four or five evenly spaced taps rather than only two. After a long pause, the tap sequence starts again.

Feedback and Repeat Filters

Feedback

Determines how much of the processed repeat returns to the delay. Low values produce one or several quickly fading echoes; high values create a long tail and allow cumulative effects to become more pronounced.

Internal headroom is provided for stability, but combining high Feedback with Wash, Diffusion, Shifter, or resonant source material can still create an extremely dense texture. When adjusting extreme tails, temporarily reduce monitoring level or output Gain.

Global HP and LP

Despite their position in the upper-left section, these filters process the outgoing Wet signal after the chain, not the incoming Dry signal. They let you quickly restrict the delay to the required frequency range:

- **HP removes low frequencies from the repeats;**
- **LP removes high frequencies from the repeats.**

The filters are steep and designed for clear range separation. At their extreme positions, they are bypassed so that a fully open range does not color the sound. The HP and LP frequencies are linked and cannot cross.

These controls do not filter Dry. Therefore, with Mix below 100%, the source signal retains its full spectrum even when the delay is restricted to a narrow band.

6. Advanced Processing

Tape Simulation

Tape Simulation combines several characteristics of magnetic recording under a single control. It is not merely saturation or a single LFO.

As the control is increased, the following processes are introduced progressively:

- random speed drift that removes the impression of a perfect sine wave;
- additional time "chew" in the worn region;
- a low-frequency head bump;
- slight channel misalignment and crosstalk;
- micro-instability of level;
- random short dropouts at high values;
- progressive darkening on each new pass;
- asymmetrical saturation with level compensation;
- pink noise that appears only while Wet is active and does not accumulate in the loop;
- and other effects.

For user convenience, mathematically calibrated processes are combined in a single control that transforms a clean digital delay through a range from warm analog repeats to worn, chewed-up tape running through a broken tape machine.

The value color gradually changes from white to orange and red, indicating entry into a more extreme region.

High values can noticeably alter the pitch, transients, stereo balance, and brightness of each subsequent repeat. This is not necessarily a drawback: on pads and textures, such behavior may be the main creative effect. For rhythmically precise delay, keep Tape moderate.

At 0%, Tape is completely removed from the signal path. Engagement is smoothed, so moving away from zero should not produce a click.

Character and Movement

Drive

Drive adds harmonics and density to the completed Wet signal. It uses smoothed nonlinear saturation with anti-aliasing protection and automatic matching of input and output energy.

Drive changes the tone while avoiding loudness change as part of the effect. It is placed after the feedback loop: the saturation is heard immediately but is not multiplied recursively on every pass.

At extreme values, perceived loudness may still change because of the altered spectrum and reduced crest factor. Evaluate the result not only by peak level but also in the context of the mix.

Mod

Mod creates gentle movement in the repeats using a short modulated micro-delay. As the control is increased, both the depth and speed of the movement rise together.

Mod processes Wet only and does not alter the main delay time. It therefore adds liveliness and gentle drift rather than disrupting the rhythm.

Tape and Mod can feel partly related, but they serve different roles: Tape imitates an unstable medium and changes several signal properties, while Mod provides cleaner periodic movement.

Diffusion

Diffusion softens the leading edge of the repeats and increases their density without creating a full reverb tail. The signal passes through several consecutive all-pass stages with different L/R timings and gentle cross-channel rotation.

Result:

- attacks become less sharp;
- individual reflections merge into a more unified shape;
- the repeat occupies more space while preserving the original tone better than Wash.

Diffusion operates inside the feedback loop and is also audible on the first repeat. The system matches energy before and after processing so that the smearing is not perceived merely as a loss of loudness.

Use low values to soften vocals and percussion, medium values for dense musical repeats, and high values for deliberate destruction of attacks. When combining it with Wash, adjust Diffusion first and then add the Wash space.

Wash

Wash transforms repeats into late reflections and an atmospheric spatial mass. Internally, diffusion is applied before and after a multi-line reverberation tank, together with stereo decorrelation, damping, and energy control.

Unlike Diffusion:

- **Diffusion smears the shape of the repeat itself;**
- **Wash creates an evolving space around the repeats.**

Wash is inside the feedback loop but is also audible on the first repeat. The higher Feedback and Wash are set, the faster rhythmic echoes turn into a continuous atmospheric layer.

High values can produce very long tails, midrange buildup, and a wall-like effect. This can be musically useful but requires level control. If the tail loses its rhythm or begins to mask the source, reduce Wash or Feedback, or use the global HP/LP filters and UNMASK.

Squeeze and Shifter

Squeeze

Squeeze gradually narrows the spectrum of the signal returned to the feedback loop.

- **Amount sets the proportion of processed feedback signal.**
- **HP sets the lower boundary of the retained band.**
- **LP sets the upper boundary.**

The filters are linked and cannot cross. The narrower the selected band and the higher the Amount, the faster subsequent generations of repeats acquire a telephone-like, radio-like, or deliberately band-limited character.

Squeeze does not fully compensate for removed spectral energy: when the filter removes the low and high frequencies, the remaining midrange is not raised back to the original full level. This preserves natural decay and avoids amplifying noise or resonances inside the feedback loop.

> Important: Squeeze is applied to the return path. Therefore, the first audible repeat may be wider than subsequent repeats. This is a normal part of the effect, not Dry leakage.

Shifter

Shifter changes the pitch of the repeats by the selected number of semitones.

- **Straight — the blend depth of the pitch-shifted signal;**
- **Pitch — a whole-semitone interval from −12 to +12 semitones.**

Internally, a windowed granular pitch-shift process uses several overlapping fragments. The attack is slightly softened, and the pitch briefly glides toward the target note to reduce electronic jumps and clicks. A very small difference is introduced between the channels to create width.

Shifter is included in the feedback loop, so every new pass receives the selected interval again. For example, at +12, subsequent generations can rise progressively higher relative to the source. The effect is also blended into the first repeat, so the result is audible immediately.

This is a pitch shifter for repeats, not a conventional reverb shimmer. At extreme intervals and high Feedback, the pitch can quickly move into an unnatural range; reducing Straight or the number of repeats is usually helpful.

Width: Detune and Haas

Both controls process Wet only. They do not convert the complete output to Mid/Side and do not alter Dry.

Detune

The left Wet channel is shifted slightly downward and the right Wet channel upward. The value is specified in cents. Two windowed reads and smooth engagement reduce clicks when the parameter is changed.

Low values provide natural width and movement. High values can create a chorus-like effect and reduce mono compatibility. Check the mix in mono after adjustment.

Haas

Haas delays the right Wet channel relative to the left. The brain interprets the small timing difference as width and direction.

The effect does not blend in M/S processing and does not delay Dry. At high values, the image may shift noticeably to the left, and comb-filter notches may occur when summed to mono. Use Haas as a spatial accent, not as a substitute for panning.

Detune and Haas can be combined, but their contributions add together. Start with one control and add the other only when necessary.

Color

Color is a tilt EQ for Wet:

- center 0 — neutral;
- negative values — darker and warmer;
- positive values — brighter and airier.

Internally, the low and high shelves move in opposite directions around a shared midrange region. As a result, Color changes the overall spectral tilt rather than behaving like a conventional LP filter.

Color is placed after UNMASK and before Detune and the global HP/LP filters. It does not alter Dry or accumulate coloration on each feedback pass.

UNMASK

UNMASK creates space for the source signal within Wet. Unlike broadband ducking, 32 ERB-like detectors on each channel analyze Dry, while 32 dynamic filters attenuate only the conflicting frequencies in the delay. UNMASK, Selectivity, and Release control the depth, precision, and recovery of Wet.

Internally:

1. Dry is analyzed by a psychoacoustically distributed bank of frequency detectors.
2. The system tracks overall activity and prominent frequency regions.
3. A smoothed dynamic EQ curve is applied to Wet.
4. Adjacent regions are linked to prevent sharp spectral spikes and filter jitter.
5. Low frequencies recover more gently, while high frequencies recover faster.

Wet is not split into and reconstructed from multiple band-pass signals. The detectors are used only for analysis, while attenuation is performed by dynamic EQ. This helps preserve a cleaner Wet phase response.

UNMASK Control

The main intensity control for the effect. Low values gently create space for the attack and intelligibility of Dry. In the upper part of the range, the response intentionally becomes more aggressive and is suitable for special effects.

Selectivity Control

Determines the width of the response:

- `1–2 — broad attenuation and the most obvious effect;`
- medium values — a musical balance;
- high values — narrower, more selective processing around prominent spectral regions.

High Selectivity does not necessarily mean stronger attenuation. It means more focused attenuation.

Release Control

Determines how quickly attenuated regions of Wet return after space has been created for Dry. This is the release of the dynamic UNMASK process, not the decay of the delay or the project's release time. The default value is mathematically calibrated and should not be changed in most cases.

- a short Release restores Wet faster and emphasizes the rhythm more clearly, but may sound restless on complex material;
- a long Release creates more stable space for Dry but may noticeably hide the tail for a while.

The detector listens directly to Dry rather than the delay's own tail. Therefore, UNMASK should not trigger itself.

> Adjust UNMASK and Selectivity together until the result feels psychoacoustically natural. As a general guideline, keep UNMASK at or below 60% and leave Release unchanged.

7. Analysis, Monitoring, and Output

Mix and Output

Mix

Mix uses a two-stage balance scheme:

- `0–50%: Dry remains at full level while Wet rises from silence to full level;`
- `50–100%: Wet remains at full level while Dry is reduced to silence.`

> Therefore:

- `0% — Dry only;`
- `50% — full Dry + full Wet;`
- `100% — Wet only.`

This differs from a conventional equal-power crossfade. At the center position, the sum may be louder than the input, especially when Dry and Wet are correlated. Gain is recommended for compensation; AutoGain is an auxiliary option.

Gain

Gain is the recommended and more precise manual level control after Mix and AutoGain. Range: −12 to +12 dB.

AutoGain

AutoGain attempts to compensate for changes in loudness. Use it as an auxiliary tool; Gain is recommended for the final render.

Bypass

Passes the original Dry signal directly. Bypass is independent of Mix, Tape, the filters, and output Gain.

Output Meter

The meter measures L/R at the very end of the DSP, immediately before audio is sent to the DAW. It displays peak and averaged energy with smooth ballistics. Red indicators flag excursions beyond the safe peak region.

If clipping occurs only at 50% Mix, reduce Gain first (recommended). Use AutoGain only as an auxiliary option. If the level rises within a long tail, reduce Feedback/Wash before compensating at the output.

Spectrum Analyzer

The spectrogram displays two smoothed curves:

- **Dry In — the spectrum of the input signal;**
- **Delay — the spectrum of the processed Wet signal before the final Mix.**

The horizontal axis displays frequency non-linearly from low to high, while the vertical axis displays level from 0 to −96 dB.

The analyzer is intended for musical observation, not laboratory measurement. The curves are smoothed in frequency and time. Rise is displayed quickly and decay smoothly.

While UNMASK is active, multiple white vertical bars fading to transparency toward the bottom show which frequencies are being attenuated and by how much. Their lower edges do not represent the exact attenuation depth in dB; use this display together with your ears.

The Delay curve includes not only UNMASK but also subsequent Wet processing, including Color, Detune, and the global HP/LP filters. Therefore, the difference between the two curves cannot be interpreted as the exact amount of UNMASK attenuation.

8. Presets

Click the preset name in the top panel to open the list.

- `GammaDelay presets — factory presets;`
- `User presets — user presets;`
- the left and right arrows cycle through the available presets;
- the Save icon opens the dialog for saving the current state;
- user presets can be renamed and deleted using the icons that appear on hover.

User preset names are limited to 20 characters. An empty name is not saved.

An asterisk (*) after the name indicates that one of the stored sound parameters has changed since the preset was loaded. Returning the parameters to their stored values removes the asterisk.

`Reset restores all parameters to their factory values and selects CLEAN IN/OUT.`

Musical delay and effect parameters are stored in the preset. Bypass, Gain, and AutoGain are excluded from the user preset state so that changing the tone does not unexpectedly alter utility output controls.

User presets are stored in:

```
%APPDATA%\PhotonDSP\GammaDelay\Presets\PresetsTable.txt
```

To create a backup, save the Presets folder. Do not edit the table while the DAW is running.

9. Trial and Activation

Free Trial

The trial period lasts 14 days.

1. Click Start Free Trial.
2. GammaDelay opens a secure PhotonDSP page in your browser.

3. Enter your email address and complete the verification.
4. Open the email from PhotonDSP and confirm the trial activation.
5. Return to the plug-in and wait for confirmation.
6. Click Start Using.

The trial requires periodic internet access. A brief network interruption does not immediately stop an already authorized session. If verification remains unavailable for too long, processing is paused and the plug-in safely returns to the original dry signal.

The offline window provides:

- `Refresh — retry verification;`
- `Buy — open the PhotonDSP website;`
- `Activate — proceed to paid serial-code entry.`

Full License

Enter the serial number in the activation field and click ACTIVATE. Pasting with Ctrl+V is supported; the keyboard layout does not affect entry of the serial number's Latin characters.

Internet access is required for initial activation. After successful activation, the perpetual license works offline. Temporary server unavailability does not disable a correctly activated purchase.

The license allows up to three activations. Reinstalling Windows usually creates a new local installation and may use another slot if the previous one was not reset.

License status is not stored in audio presets and is not transferred by copying a preset file. When GammaDelay is inactive, it does not cut off the sound: the output smoothly returns to the original Dry signal, after which internal processing stops.

10. Practical Setup

General Approach

GammaDelay uses psychoacoustic and spatial effects, so there is no universal setting. Choose a suitable preset and adjust it, or start from scratch.

Start with low values. Extreme settings may produce undesirable results. Use the Spectrum Analyzer and Output Meter; evaluate the result with the meters as well as by ear.

© 2026 PhotonDSP. All rights reserved. VST is a registered trademark of Steinberg Media Technologies GmbH.