Manuals+

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BRAINWORX

bx_pulsar

Plugin Manual

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Welcome to bx_pulsar

bx_pulsar combines the tone of analog hardware, the flexibility of modern FX, and the precision of Brainworx engineering into a single, intuitive plugin.

Brainworx's new creative delay plugin is designed to offer a versatile, musical, and highly intuitive delay solution blends a wide range of classic and modern delay tones with innovative features like an 8-step sequencer, ducking compressor, and dual delay routing. bx_pulsar is the companion delay to our bx_aura reverb, replacing cluttered plugin chains or limited stock delays with one powerful, user-friendly delay processor.

ⓘ Download and install your plugin using our Installation Manager: https://www.plugin-alliance.com/en/installation-manager.html

Thank you for choosing bx_pulsar. We hope you enjoy it!

Key features

The following list gives you an overview of bx_pulsar's key features:

- **Five Delay Modes:** Choose from delay colours past, present, and futuristic, each with algorithm-specific parameters including Diffusion, Sparkle and Modulation amount.
- Sub-Types: Within the Magnetic and Circuit modes, further fine-tune tone and behavior via a selection of progressively more textured, noisy and characterful sub-types, from studio-grade reel-to-reel tape machines to dusty cassette tapes, through classic echo boxes, early rack units, and crunchy guitar delay pedals.
- **Multiple delay line configurations:**
  • **Dual Mode**: provides stereo routing with Ping Pong and Criss Cross options, plus custom delay time ratios – including presets for Golden Ratio, Plastic and Semitone ratios, perfect for easily setting up polyrhythmic or "random-pattern" repeats.
  • **Sequence Mod**e: A flexible 8-step delay sequencer with per-step panning, one-

shot/loop options, and step-based timing.

- **Additional Features:**
  - Test Tone generates short noise bursts for real-time preview
  - Ducking Compressor (Post, Feedback or both) with sidechain
  - Swing and Global Offset for finetuning the groove
  - L/R Time Offset
  - Advanced Filtering: High/Low cut and frequency damping
  - Freeze, Wet Gain, and full GUI animation

bx_pulsar overview

bx_pulsar consists of the following areas and main controls:

1. Top toolbar: Additional global controls relevant to the plugin's processing. For more information, refer to Top toolbar.
2. Display Section: Contains a selection of delay-modes, flexible voicing and a filter-module. For more information, refer to Display section.
3. Main Controls: Delay-specific main controls, timing and ducking are found here. For more information, refer to Main section.
4. Bottom toolbar: Preferences, license information, and documentation. For more information, refer to Bottom toolbar.

Display section

Different delay technologies, modes and filters to define the delay's character.
This section contains the following modules:

1. Delay modes: Five different delay modes with unique parameters and types can be found in the central display area.
2. Pattern: Switch between DUAL mode and SEQUENCER
3. Filters: Precisely shape your sound with filters placed at optimal points within the internal signal path.

   💡 Clicking the Brainworx logo or the plugin name in the UI will open a splash screen containing team credits and default settings.

Delay modes

Various delay "mediums" offer rich sonic identities, while unique sub-modes give users access to distinct characters like tape, cassette, modded pedals, or classic BBDs.
Every mode includes three global controls without variance:

1. **[Delay mode]**: Chose between different delay engines and configurations by clicking the arrows or the delay mode's title to access a huge variety of delay responses and characters.
2. **Clear:** A click on the delay mode graphic will clear the delay buffer and resets the delay to zero input. This parameter is a UI-only button and unavailable for automation and controller surfaces.
3. **Freeze:** When the delay is frozen, the input to the delay core is muted and an endless tail is created from the current audio material without altering its timbre. Every parameter of the plugin remains active during the frozen state. Elements that sit in front of the delay core won't have any audible effect since no new input is passed

through. Be aware that a frozen signal degrades over time when using modulation.

The available delay modes of bx_pulsar come with different features:
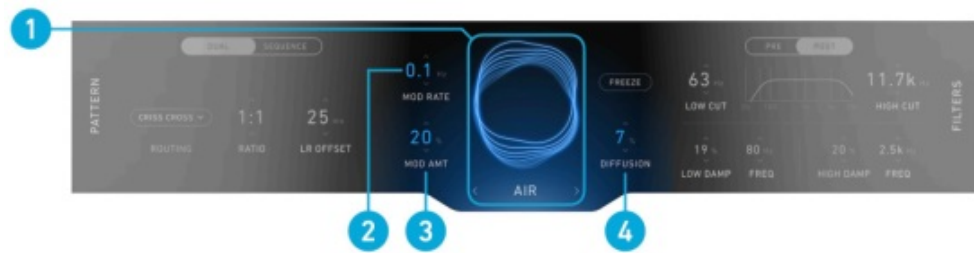
1. **AIR:** Free from artifacts, the linear Air delay represents a digital delay configuration as clean as it can get. No pitch-shifting occurs when changing this variant's timing.
2. **Mod Rate:** Change the modulation's rate.
3. **Mod Amt:** Add sine-waved pitch modulation to the delay module.
4. **Diffusion:** Creates a reverb tail around each delay repeat.
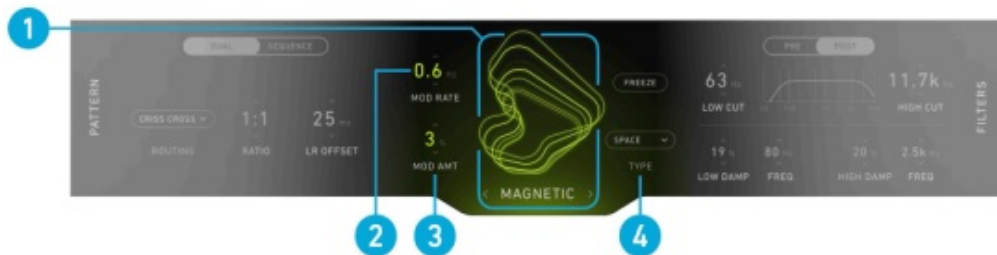
1. MAGNETIC: Magnetic memory represents the earliest technology of delaying a signal to its real-time reference and varies in stability as well as tonality related to its medium and applied mechanics.
2. Mod Rate: Change the modulation's rate of the sine waves for Wow (and Flutter for Cassette).
3. Mod Amt: Add wow, flutter and Brownian noise depending on the selected type.
4. Type: Four magnetic delays with differing pitch shifting behaviors, Wow-modulation and Flutter:
   • **Reel:** Represents a clean tape delay with fresh tape, demagnetized heads and a stable motor reaching the fastest pitch response. No noise and a little treble attenuation.
   Modulation-type = variable Wow and fixed Flutter
   • **Space:** This model washes out the low end and adds grit by introducing more noise and saturation. Rotation reacts slower than Reel and Cassette which leads to longer

pitchshifting artifacts when changing the delay-time.

Modulation-type = variable Wow and increased fixed Flutter

• **Cassette:** Looped cassettes and modded recorders have been a cheap alternative to expensive tape-delays and introduced their own characteristics into music-production.

Allows quick access to pumping and compressed delays followed by dramatic filtering, noise, modulated flutter and drop-outs. Works great for Lo-Fi type genres.

Modulation-type = variable Wow and variable Flutter

• **Dusty:** Unmaintained magnetic delay type: Reduced dynamics, noisy output, heavily filtered input, and dropouts. This delay's sluggish motor results in the longest pitch-curves.

Modulation-type = variable Wow and fixed Flutter
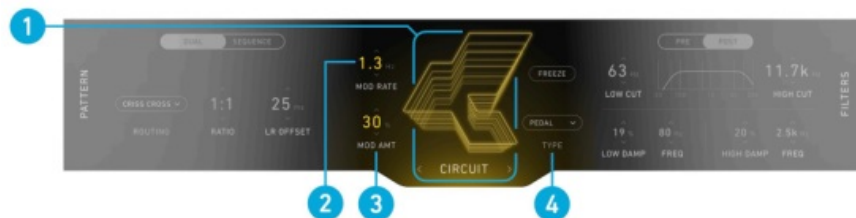
1. CIRCUIT: The non-linear BBD (bucket brigade device) delay has a warm tonality and comes with a range of classic guitar pedal delays to analogue rack delays from the pre-digital era.
2. Mod Rate: Change the modulation's rate.
3. Mod Amt: Add pitch modulation to the delay module.
4. Type: Four BBD-type delays with different modulation and pitch-shifting behavior:

   • Studio: This is a BBD-delay with a clean attitude and subtle filtering and saturation character.

   Modulation-type = sine.

   • Vintage: An early version of a BBD-type studio delay with gritty filtering and saturation to be introduced with every repetition.

   Modulation-type = sine.

   • Pedal: Representing a typical old guitar effect pedal, it injects character to instruments and vocals by strong filtering and distortion with each and every repetition. It is able to self-oscillate with high feedback values.

   Modulation-type = warped triangle

• Modded: This type adds character by heavy filtering and distortion as well as introducing aliasing. The modded BBD is also able to self-oscillate with high feedback values.

Modulation-type = random

1. AETHER: The creative delay in bx_pulsar's arsenal: adding sparkle and radiance, this one is a unique tool to experiment with pads and add character to spherical sound designs. The delay stays clean from pitch-shifting artifacts when changing the delay time.
2. Radiance: Add more magic by increasing radiance, a constant octave up, introduced to the feedback path.
3. Sparkle: Adds creative grain processing surrounding each delays' repetition.
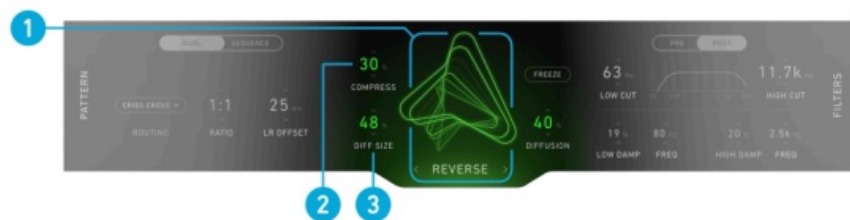
1. REVERSE: This mode is a typical reverse effect that works great for pad-like atmospheric textures or creative experiments. Free of pitch-shifting artifacts when changing the delay time.
2. Compress: Upward compression making the reverse delay's detail more audible while also smoothing out transients.
3. Diff Size: Change the size of the diffusion.

🔅 **AETHER** and **REVERSE** work particularly well in combination with **FREEZE** for generating granular pad tones and atmospheres.

Pattern

Chose from either Dual for studio-type delay routings or Sequencer to get creative with

up to eight separate delay lines.

This section consists of the following controls:

1. [Pattern Mode]: Select between a dual delay line setup (default) and a step-sequencer with up to 8 separate delay lines.

   DUAL

   Common delay setup with two separate delay lines (left and right) and four differing configurations:

2. Routing: bx_pulsar can be wired in four different setups when in dual mode:

   • Mono In: Both delay lines receive the sum of the left and right input signal.

   • Stereo In: Discrete delay lines for left and right to keep the stereo information relevant inside of the delay engine.

   • Ping Pong: The left delay line receives a sum of the left and right input to handover its signal to the right delay line in the feedback path. The right delay line feeds its output back into the left delay's input to close the ping pong loop.

   • Criss Cross: The left and right delay lines feed their output signal back from left to right and vice-versa to swap sides after each repetition.
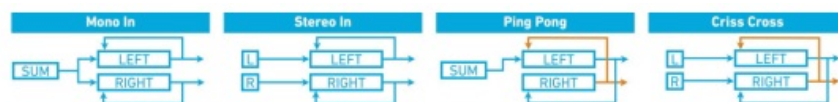
3. Ratio: The delay-ratio parameter easily allows to setup syncopic, poly-rhythms and other complex rhythmic structures that aren't based on note values. Set to 1:1 by default, both delay lines have the same timing, they are in sync to each other unless the L/R Offset is applied.

   Set to a ratio of 2:3 for example, the left delay line will repeat its input twice while the right delay will repeat the incoming signal three times during the same time-span. This allows setting up rich stereo enhancement in no time and without the introduction of additional delay lines.

   SEMI , PLSTC and GOLD (semitone, plastic and golden ratio) are extreme settings and represent special cases: they prevent the left and right delay lines from rhythmic repetition.

RATIO	delay interval = ♩ (1/4 note)		♩		♩		
repetitive polyrhythms							
1:2	1/8th note		♪				
2:3	1/4T note		1/4T		1/4T		
3:4	dotted 1/8th note (3/16)		♪		♪		♪
3:5	3/20	3/20	3/20	3/20	3/20		
non-repetitive polyrhythms							
SEMI	1/4,238		1/4,238		1/4,238		
PLSTC	1/5,299	1/5,299	1/5,299	1/5,299			
GOLD	1/6,427	1/6,427	1/6,427	1/6,427	1/6,427		

4. L/R Offset: Add a manual offset between the left and right delay lines. A setting of 50 ms will proportionally shift the left delay 25 ms ahead, and the right delay 25 ms behind the global delay time before entering delay core and feedback loop.

SEQUENCE

Mono input configuration with built-in panning to be spread in the stereo field by up to 8 delay lines:

5. [Step switches]: Click a step to individually de-/activate each step of the sequence.

6. [Step panning]: Setting up the exact panning position of each step allows for building stereo tapped delays or complex movements in the stereo field.

7. [Sequence] Mode: Set to LOOP by default, the last step feeds the first delay of the sequence.
Switching this mode to ONCE (one-shot-mode) disables the repetition of the sequencer's pattern even when feedback is set to a high value. The feedback parameter can attenuate late steps when set to low values.

8. [Sequence] Steps: The amount of steps equals the amount of delay-lines available in the delay engine of bx_pulsar. Each step represents a discrete delay-line.

Filters

Tonal shaping tools to adjust the delays overall sound.
This section consists of the following controls:

Input/output filters

1. Pre/Post [position]: When set to Pre, the filters are located before the delay process and are inaudible if Freeze is active. When switched to Post, the filter works behind the delay core and will be audible when Freeze is activated.
2. Low Cut [frequency]: Cutoff frequency of the low cut / high pass filter. The slope of the cut filter is 12 dB per octave.
3. High Cut [frequency]: Cutoff frequency of the high cut / low pass filter. The slope of the cut filter is 12 dB per octave.

   Damping filters

4. Low Damp [amount]: Located in the feedback path of each delay-line, the attenuating low- shelving filters dampen every feedback-cycle by a given percentage.
5. [Low Damp] Freq: Sets the low damping frequency.
6. High Damp [amount]: Amount of damping applied to the high frequencies.
7. [High Damp] Freq: Sets the high damping frequency.

Main section

This section features the main delay and groove controls, as well as an on-board ducking compressor.
It contains the following modules:

1. Main delay controls: The most important delay parameters can be found here.
2. Groove: Control the rhythmic feeling of the delay with swing and offset.
3. Ducker: Ensuring clarity between the wet and dry signals made easy.

Main delay controls

bx_pulsar's most important delay settings are placed in the center of the main section. This section consists of the following controls:

1. Sync: When deactivated, the timing of the Delay changes from synchronized tempo-related to manual time-based values.

2. Delay [time]: sets the global interval of the delay engine.

   • Synchronized Timing: By default, synchronization is enabled, the scale shows note values instead of milliseconds, helping to create rhythmic effects.

   • Manual Timing: When Sync is deactivated, the scale switches from note values to milliseconds.

3. Width: Controls the distance of the left and right voices from the center position determined by PAN. Negative Width values mirror the stereo field around its center.

4. Mix: Set the mix and balance between the direct signal and the processed signal. The lock icon to the right locks the current Mix value so it doesn't change when switching presets. It is always off when you initially instantiate the plugin in a session.

5. Pan: Defines the position around which left and right voices are centered in the stereo-field. The further you turn the Pan knob away from the center, the more the Width range is restricted, as left and right channels are always symmetrically centered around the Pan position.

6. Feedback: Controls the amount of the delay's output fed back into its input. Without any feedback applied only a single delay appears, by increasing this value more delays/echoes appear up to endless repetitions and distorting swells if turned up to extreme settings.

Groove and Ducker

Control further details by adding groove related timing and dynamic depth in the groove and ducker modules.

These sections consist of the following controls:

Groove

1. Swing: Introduces swing to the delay line and shifts the odd delay repetitions to a laid back feeling when turned right (>50%) or uptight swing if turned left (<50%).
2. Offset: To constantly shift the whole delay line, applying negative values shorten the first offset, while positive values increase the offset in milliseconds.

   Ducker

3. Ext SC: Enables/disables the external sidechain input.
4. Target: Conventional ducking is achieved by the default POST setting. Attenuation of the FEEDBACK loop shortens the delay's tail once triggered by incoming audio leading to a less unorganized tail underneath the dry signal. Ducking BOTH offers a combination which leads to a very tidy and shortened delay tail while input signal is present. This is a versatile option in combination with EXT SC (external sidechain) signals to control the length as well as the volume of the delay design.
5. Amount: The amount of ducking to be applied resulting from a combination of threshold and ratio within one parameter: Raising the amount decreases the threshold while proportionally increasing the ratio leading to more gain reduction. The ducking compressor is triggered by the dry input if the external sidechain is disabled (default setting).
6. Release: Sets the release time of the ducking compressor.

Top toolbar

Additional global controls related to plugin settings and processing are available in the top toolbar.

1. Power: Bypasses the processor when disengaged.
2. UI Size: Sets the size of the plugin's user interface.
3. ↩ ↪: Undo and redo changes made to controls up to 32 steps.
4. Bank A B C D: Each preset allows you to switch between four banks (A, B, C, D) of controls.
5. Copy: Copy the active settings to memory.

6. Paste: Paste the copied settings to the active bank.

7. Reset: Reset the current bank.

8. Test Tone: Sends a short test tone (a random noise burst) through the delay. This helps to audition the current delay settings.

9. Wet Gain: Adjusts the level of the wet signal. This allows to compensate for any given gain changes while adjusting the effect's output level.

10. [Animation Icon]: Turns off the animation of the delay mode graphic in the center display section.

Bottom toolbar

Preferences, license information, and documentation are available in the bottom toolbar.

1. Plugin Alliance Logo: If your computer is online, clicking the Plugin Alliance logo will take you to the Plugin Alliance website via your web browser.

2. License Info: The toolbar displays information about the type of license you're running. Trial licenses are displayed along with the number of days until expiration; there is no note for full licenses, as these are unlimited.

3. Dollar Icon: If you are using a demo/trial version of a Brainworx product, you can click this icon to open a browser that redirects you to the respective product page in the Plugin Alliance store. Here, you can purchase a product without searching for it on the Plugin Alliance website.

4. Key Icon: Clicking on the key icon brings up the activation dialog, allowing you to manually reauthorize a device in the event of a license upgrade or addition. You can also use this feature to activate additional computers or USB flash drives.

5. Help Icon: Clicking the help icon opens a context menu that links to the product manual PDF and other helpful links, such as checking for product updates online. You must have a PDF reader installed on your computer to read the manual.

   • Open Manual… with your operation system's preferred PDF reader. A PDF reader is required to read the manual.

   • Product Info… will take you to the product page of bx_pulsar if your computer is online.

• Download Updates… leads you to the product page's Downloads-Section.

• Legal Info… opens a pop-up window declaring legal usage of third party technology.

• Plugin Alliance Website… will take you to the Plugin Alliance website via your web browser.

• Usage Data Tracking… will open a pop-up window to activate or deactivate Usage Data Tracking.

Additional information

Usage data tracking

Help us improve your experience.

Plugin Alliance by Native Instruments is using data tracking to improve the user experience and usability of our products. Data tracking can be deactivated at any time in the help menu. This data is collected according to our [Privacy Policy](#).

Online resources

System requirements & supported platforms: https://www.plugin-alliance.com/en/systemrequirements.html

Details about your product: https://www.plugin-alliance.com/en/products/bx_pulsar.html

Installation, activation, authorisation and FAQ: https://www.plugin-alliance.com/en/support.html

Credits

Programming and Algorithms: Matthias Heinz, Florian Göbel

UI-Design: Nico Lezim

Product Management: David Stoll

Documentation: Albert Gabriel

BRAINWORX

Documents / Resources

[BRAINWORX bx_pulsar Flagship Multi Type Delay Plugin](#) [[pdf](#)] Instruction Manual

bx_pulsar Flagship Multi Type Delay Plugin, bx_pulsar, Flagship Multi Type Delay Plugin, Multi Type Delay Plugin, Type Delay Plugin, Delay Plugin

References

- [User Manual](#)

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🏷 BRAINWORX, bx_pulsar, bx_pulsar Flagship Multi Type Delay Plugin, Delay Plugin, Flagship Multi Type Delay Plugin, Multi Type Delay Plugin, Type Delay Plugin

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