# BASSGRID

Reason Studios Reason RACK EXTENSION

**LFX-XP PATTERN LFO**
ADVANCED CREATIVE CONTROLLER DEVICE

**Re**
Rack Extension

PATTERN LFO
**LFX XP**
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# LFX XP

## ADVANCED PATTERN LFO

*Congratulations on purchasing LFX-XP Advanced Pattern LFO!*
*BASSGRID team*

**LFX-XP Advanced Pattern LFO Rack Extension**
# OPERATION MANUAL

# Revision history

### Version 1.0.1

Updated the main display:

- More accurate presentation of the modulation effect (since it's bipolar)
- The "Custom Wave Type" columns expand from the vertical middle instead of from the bottom
- Depth is also presented more accurately, also expanding from the vertical middle

Enable Modulation fix:

- When modulation is OFF, the LFO leaves the target intact instead of at the last state the LFO was in (i.e. when the modulation is OFF, nothing is sent out of the device).

Added the property "Curve Color Intensity", now users can adjust the color of the body of the curve.

# Contents

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## About LFX-XP Advanced LFO

LFX-XP Advanced, bi-polar Pattern LFO is an innovative free-draw LFO built on our own revolutionary LFX architecture. The two main characteristics that separate LFX-XP from other LFOs are pattern-controlled modulation waves as well as our revolutionary LFX free-draw display which lets you draw your own modulations in real-time.

It's powered with:
- Standard LFO modulation waves
- 64-step, free-draw display for drawing unlimited LFO waves in seconds
- Note-triggered or MIDI-triggered modulation for ultimate control
- Total LFO control
- Awesome UI with real-time feedback

It's perfect for:
- Instantly creating powerful effects and modulations
- Creative producers
- Live performance
- Song creation process

## Quick tips

The most important thing to know is that notes inside LFX-XP is what triggers the LFO so ALWAYS have notes drawn inside LFX-XP's note lane in order for it to work as intended.
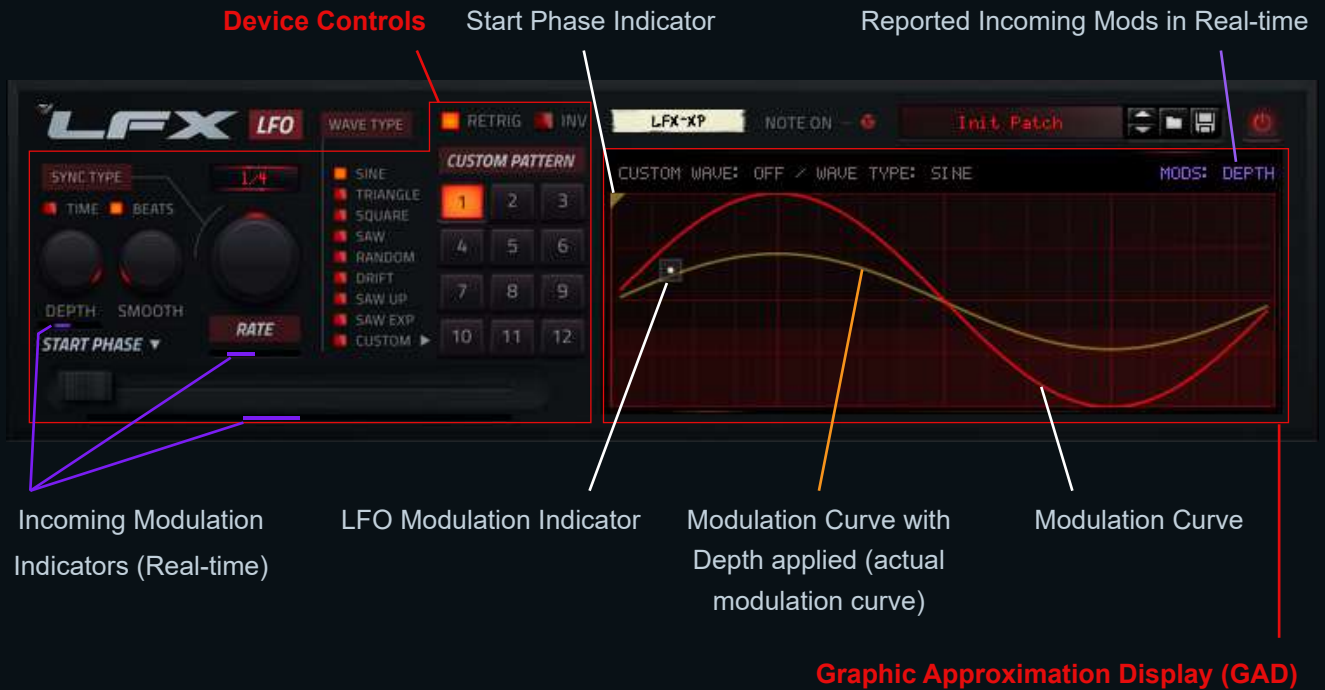
You can copy the notes of the source instrument you're modulating or you can draw your own notes. Once you copied/drawn the notes, you can re-arrange the notes in LFX-XP to match your own feel and groove. The LFO modulation starts/ends when the note inside the note lane starts/ends. If "Retrigger" is enabled, the modulation phase (position) resets to start on every note, otherwise it's running freely after the first note and, while further notes will control the actual modulation, they won't affect the modulation phase (position). Note key is not important, it's only important if a note is played and for how long. You will be able to see that the LFO is working by the modulation analyzer/indicator (the small white dot and square on the main display).

The quick steps to start modulating for e.g. filter frequency:
1. On the flip-side of the rack (tab), make sure the filter has CV input for frequency
2. Drag a cable from any of LFX-XP's CV outputs and connect it to the filter's CV input for frequency
3. Draw a long note inside LFX-XP (not important which note)
4. Play the song/loop
5. Increase "Depth" on LFX-XP (if it's 0, there will be no modulation)
6. Choose the "Wave Type" you like, set the "Depth", "Rate", "Smooth" and "Sync Type" to what you like.
7. To draw a custom wave or use patterns, set the "Wave Type" to "Custom".

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# Device Sections

## Front Panel

Device Controls     Start Phase Indicator     Reported Incoming Mods in Real-time



Incoming Modulation Indicators (Real-time)     LFO Modulation Indicator     Modulation Curve with Depth applied (actual modulation curve)     Modulation Curve

Graphic Approximation Display (GAD)

## Back Panel



CV Outputs     CV Inputs

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# Device Properties

- Enable Modulation: Enables/disables the modulation
- Retrigger
    - OFF: Trigger/Initialize the LFO with a single note in the note lane and it runs independently
    - ON: Each note in the note lane re-triggers the LFO
- Invert: Invert the modulation, reduce target parameter instead of increasing it and vice versa.
- Time Mode: Set Rate units to Time (Hz - cycles per second) or Beats (quarternotes per cycle)
- Depth: Amount of modulation
- Smooth: Smoothing of parameter changes - useful for "Custom" Wave Type and for MIDI controllers. At the maximum setting the initial value is held forever.
- Rate: Sets the duration of 1 cycle of the LFO waveform (relative to Time Mode)
- Wave Type:
    - Sine
    - Triangle
    - Square
    - Saw
    - Random (random steps)
    - Drift (smooth random)
    - Saw Up
    - Saw Exp (exponential decay)
    - Custom: a wave created by the bars you draw on the LFX display.
    - Custom Wave Type also lets you use the pattern function.
- Custom Pattern: Controls which "Custom" Wave Type Pattern to play (12 patterns in total)
- Start Phase: Position of the LFO wave (from start to end, in degrees) on which to start modulating. 180
- degrees will start from the middle of the LFO wave.
- Custom Wave Steps: A custom, 64-step interactive display that lets you draw your own LFO wave. NOTE: The 64 steps of the first 3 patterns (and 7 steps of the 4th pattern) can be fully automated, similar to Reason's Vocoder, but it might impact the performance due to the sheer number of automated properties. Other patterns' steps are not automatable due to the limit of automatable properties in Reason.
- Curve Color Intensity: Adjusts the transparency of the LFO curve's body color from bright red to completely invisible.

Even though the custom waveform is created from 64 steps, the device's algorithm will make the actual modulation smooth. In extreme cases, on extremely low rates and with no smoothing applied, the actual modulation might be stepped so a tiny amount of smoothing is required in order to smooth out the modulation.

Modulation indicator (the white dot in the white square): follows the modulation wave (phase and velocity) of the currently selected waveform, in real-time.

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## Polarity and range

The LFO creates bipolar modulation with full-power modulation in both directions. This allow you to cover the entire range of automation of every parameter, even when the parameter is at its minimum and maximum values. For example, if a parameter goes from e.g. 0-100 is targeted with LFX-XP (with "Depth" set to 100%), LFX-XP would be able to modulate that parameter by 100 in either direction. Total range would be 200, and if the parameter was set at 0 (min), it would be able to reach 100 (max) and vice versa, and it should clip in other direction, meaning instead of going below 0 or over 100, it would clip at the parameter's min/max values.

## CV Outputs / Inputs

There are 10 available CV outputs / dupliates. Each of these sends the final LFO curve, meaning if any incoming modulations are changing the current modulation waveform, the outputed value will include those changes. The final value, before incoming modulations are applied, is multiplied by Depth. At Depth of 100%, the modulation has the power of the entire range of the targeted parameter, in both ways. At 50% Depth, the range would decrease by half, at 0% there would be no modulation etc. There are 3 CV inputs available and those are for "Rate", "Start Phase" and "Depth".

## Recording Automations via Display

If you start recording and start drawing over the "Custom" waveform (first 3 patterns), you'll notice that a bunch of automations is being created. 64 to be precise, one for each step of the custom waveform. But this might impact the performance due to the sheer number of automated properties and it is not recommended so it should be kept as a last resort or for very important segments.

## Display

Graphic Approximation Display (GAD) is the visual representation of the modulation process. It displays an approximation of the actual LFO waveform which might not be 100% precise but provides a clean curve shape and comes very useful for better control over the device and for seeing what is actually being accomplished. The GAD displays the original Modulation Curve (red) for basic waveforms (Wave Type) or a stepped Modulation Curve for Custom Wave Type. It also shows the "Depth Curve", that is, the original Modulation Curve with Depth Applied, it has its own stepped-type curve equivalent for the Custom Wave Type. LFO Modulation indicator (the white dot in the white square): follows the modulation wave (phase and velocity) of the currently selected waveform, in real-time. Start Phase Indicator is the vertical red line with a triangular yellow marker at the top, it indicates the Start Phase position (where the LFO will be retriggered from, useful when setting the Sync Type to "Beats", then it matches the tempo). Finally, the GAD reports incoming mods by name in real-time (e.g. MODS: DEPTH).,

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## Support

For support regarding this device, please visit https://www.bassgrid.com/support-section/

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