

# TfxMod

## TimeFX Chorus / Flanger



## User Guide

### Version 1.5

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# Introduction

Thank you for purchasing TfxMod. To help you get the most out of this product, please read this manual carefully.

TfxMod is a chorus / flanger effect AudioUnit Extension plugin. It uses delay lines which are inspired by BBD (bucket brigade device). The delay line is identical to the delay line of the TfxEcho except its buffer length. The delay line uses fixed length buffer and an artificial clock to sample input signal in variable sampling rate. When the delay time is changed, the delay line can produce pitch change effect which is similar to the behavior of the BBD based chorus / flanger unit.

## Features

### AudioUnit Extension

Chorus Effect

Delay Time: From 1 ms to 40 ms

Feedback: 0%

Modulation width: From 0 ms to +/- 1 ms

Flanger Effect

Modulation Mode: mode1, mode2, and mode3

Delay Time: From 1 ms to 20 ms (mode1&2), From 1 ms to 13 ms (mode3)

Feedback: From 0 % to 100 %

Modulation width: From 0 ms to 39 ms (mode1), From 0 ms to 19 ms (mode2), From 0 ms to 12 ms (mode3)

Common

Adjustable lowpass filter and high-pass filter.

Modulation rate: From 0.01 Hz to 10 Hz

LFO Frequency can be synced to the tempo provided by the host application.

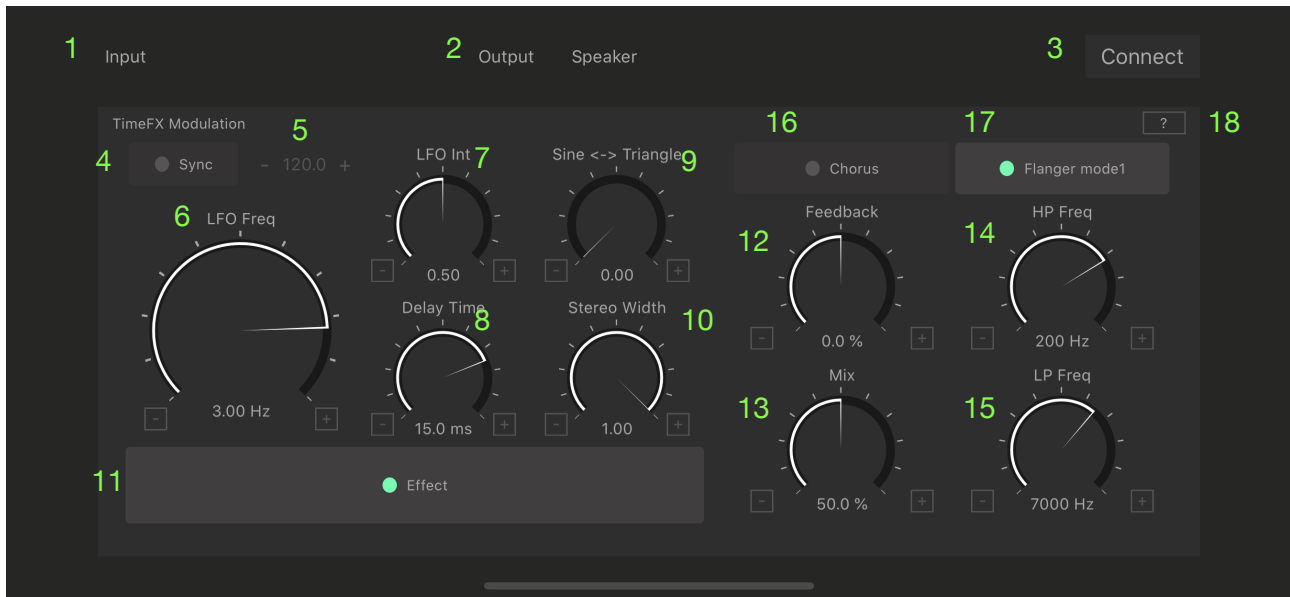
LFO Waveform: Continuously variable from sine wave to triangle wave.

Stereo Width: LFO Phase offset from 0 degree to 180 degree.

### Host Application

Host application uses system audio input as an audio source and processed audio signal is routed to the system audio output.

# User Interface



## Host Application

### 1. Audio Input Source Label

Display a name of the Audio input source

### 2. Audio Output Source Label

Display a name of the audio output source

### 3. Connect button

Tap this button to enable / disable connection from audio input source to AUv3 Extension.

## AudioUnit Extension

### 4. Sync Switch

Tap this button to enable / disable MIDI tempo sync

### 5. Tempo

Shows value of the tempo provided by the host application. If the host application don't provide tempo, value of tempo can be adjusted manually by + and - buttons.

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## 6. LFO Frequency

Adjust frequency of the LFO to control speed of the modulation.

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## 7. LFO Intensity

Adjust intensity (width) of the modulation.

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## 8. Delay Time

Adjust delay time to control center position of the modulation.

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## 9. LFO Shape

Adjust shape of the LFO Waveform from sine wave to triangle wave.

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## 10. Stereo Width

Adjust phase offset of LFO to control stereo width.

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## 11. Effect Switch

Tap this button to turn on or turn off (bypass) the effect.

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## 12. Feedback

Adjust amount of the feedback for flanger effect.

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## 13. Mix

Adjust amount of the effect signal mixed with the original signal.

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## 14. High-pass filter Frequency

Adjust frequency of the high-pass filter.

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## 15. Lowpass filter Frequency

Adjust frequency of the low-pass filter.

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## 16. Chorus Switch

Tap this button to select chorus effect.

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## 17. Flanger Switch

Tap this button to select flanger effect and a modulation mode from mode1, mode2 and mode3.

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## 15. Help Button

Tap this button to show user guide.

## **Host Application**

Host application uses system audio input as an audio source and processed audio signal is routed to the system audio output.

## **How to enable / disable effect unit**

1. Tap connect button to enable / disable connection from audio input source to AUv3 Extension.

## **Permission to access microphone**

When application is launched at the first time, it will ask permission to use built-in microphone. If the permission is denied, application can't access to audio input source.

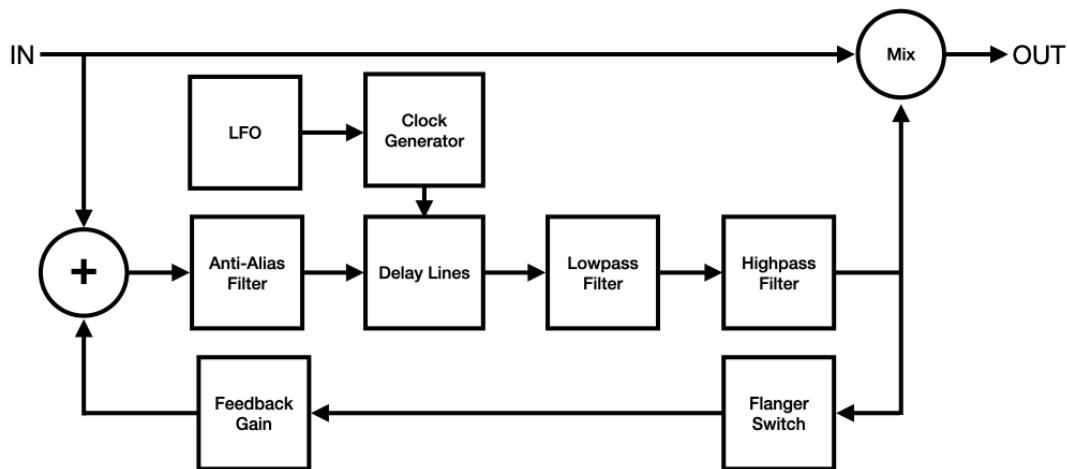
If you wish to set the permission manually, change preference under Settings -> Privacy -> Microphone.

## **Feedback Loop**

When audio input source is built-in microphone and audio output source is built-in speaker, connection from audio input source to AudioUnit Extension is disconnected to prevent audio feedback loop. If you want use built-in microphone as an audio input source, please connect headphone or line out.

# AudioUnit Extension

## Signal Flow



## Operation

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### Input Signal Level

Level of input signal should be about -6dB or less. If the input signal is too hot, it will cause distortion in output signal.

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### Effect Type

Tap chorus switch or flanger switch to select effect type. Ranges of the delay time and the LFO Intensity change based on the selected effect type.

When flanger effect is selected, tap on flanger switch to select modulation mode from mode1, mode2 and mode3.

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### Modulation Speed

LFO Frequency dial controls speed of the modulation. When sync switch is turned on, LFO Frequency can be set as note value which is synchronized to the tempo provided by the host application. If tempo is not provided by the host application, value of the tempo can be manually adjusted. Valid range of the note value is automatically adjusted base on the current tempo.

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### Modulation Width

LFO Intensity dial controls width of the modulation and delay time dial controls center position of the modulation.

When chorus effect is selected, range of the LFO intensity is from 0 ms to 1 ms and range of the delay time is from 1 ms to 40 ms.

When flanger effect is selected, range of the LFO intensity and range of the delay time changes depend on the selected modulation mode.



Type	Delay Time	LFO Intensity (max)	Comment
<b>Mode1</b>	From 1 ms to 20 ms	From 0 ms to 39 ms	Modulation width is +/- current delay time. LFO Int changes the modulation width from 0% to 100%.
<b>Mode2</b>	From 1 ms to 20 ms	From 0 ms to 19 ms	LFO Int crossfades LFO signal and delay time signal.
<b>Mode3</b>	From 1 ms to 13 ms	From 0 ms to 12 ms	LFO Int crossfades LFO signal and delay time signal.

Rotate delay time dial counterclockwise to emphasize higher frequency or clockwise to emphasize lower frequency. If compared with manual knob of flanger pedal, emphasized frequency moves reverse direction.

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## LFO Shape

LFO shape dial controls shape of the LFO waveform. When the dial is rotated fully counterclockwise, shape of the waveform is sine wave. When the dial is rotated fully clockwise, shape of the waveform is triangle wave.

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## Stereo Width

Stereo Width dial controls phase offset of the LFO. When the dial is rotated fully counterclockwise, stereo width is 0%. (phase offset is 0 degree) When the dial is rotated fully clockwise, stereo width is 100%. (phase offset is 180 degree)

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## Regeneration (flanger effect)

Feedback dial controls amount of regeneration from 0 % to 100 %. Turning the feedback dial clockwise enhances amount of the flanger effect.

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## Filters

Delayed signal is routed to high-pass filter and low-pass filter before mixed with dry signal. HP frequency controls frequency of the high-pass filter. LP frequency controls frequency of the low-pass filter.

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## Mix

Adjust balance of the direct sound and delayed sound from 0 % (Dry) to 100 % (Wet).

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## Effect Switch

Tap effect button to turn on or turn off (bypass) the effect.

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## Dial UI: Fine Adjustment and Reset

Use + and - buttons to adjust parameter values. Double tap on dial UI resets the dial to the default position.

# Specification

Delay Time	Range from 1ms to 40ms (chorus), from 1ms to 13ms / 20ms (flanger)
Feedback	Range from 0% to 100% (flanger)
Mix	Range from 0% to 100%
Highpass Filter	Range from 20Hz to 500Hz
Lowpass Filter	Range from 1000Hz to 20000Hz
LFO Frequency	Range from 0.01Hz to 10Hz
LFO Intensity	Range from 0.0 to 1.0 Chorus: from 0ms to +/- 1ms Flanger: from 0ms to 12ms / 19ms / 39ms
Effect Switch	ON or OFF
Sync Switch	ON or OFF
Chorus Switch	ON or OFF
Flanger Switch	ON or OFF
Frequency Range	From 0Hz to 22.05KHz (effect)

## What's new in version 1.0

- Initial release

## What's new in version 1.1

This version contains improvements and bug fixes.

- [Flanger] LFO Intensity dial acts more close to the width knob of the vintage flanger pedal.
- [Flanger] Delay time dial act more close to the manual knob of the vintage flanger pedal.
- [Flanger] Feedback is adjusted to be useable in all range from 0% to 100%.
- [Flanger] Modulation in higher LFO frequency is adjusted to stay in useable range.
- Fixed distortion caused by large feedback amount.
- Fixed distortion caused by switching effect mode from flanger to chorus.

## What's new in version 1.2

This version contains improvements and bug fixes.

- [Flanger] Modulation behavior can be selected from three modulation modes. Mode1 is equivalent to the modulation behavior of the version 1.0. Mode2 is equivalent to the modulation behavior of the version 1.1. Mode 3 is newly added and range of the modulation is limited to 13 ms so that the modulation stays in the range of the flanger effect.
- [Flanger] Fixed problems of the feedback gain control.
- Fixed click noise caused by turning effect button on or off.
- Label of effect button is changed.

## **What's new in version 1.3**

- Fixed a problem in initialization process of AudioUnit Extension which may leads the AudioUnit Extension to crash or may leads state recovery to fail.

## **What's new in version 1.4**

- Support iOS 14 / iPadOS 14.

## **What's new in version 1.5**

- Support iOS 15 / iPadOS 15.