

# EXD-80

## VST DRUM SYNTHESIZER

### USER GUIDE

VERSION 1.02



# Introduction

## Description

EXD-80 is a virtual analog drum/percussion synthesizer with flexible sound design abilities. The plugin is capable of producing a wide variety of electronic drum sounds ranging from emulations of classic drum machines to those found in contemporary styles such as Electro, Glitch, Industrial, Dubstep, Drum n Bass, Breakbeat and Trance. EXD-80 features 8 drum modules (kick, snare, hi-hats and 5 x percussion modules) and 4 stereo output pairs, each with its own effects unit (granulator and waveshaper).

## Requirements

EXD-80 is a VST instrument plugin (32-bit) for Microsoft Windows operating systems: Windows XP (SP2 or later), Windows Vista, Windows 7, Windows 8.

A host application that supports 32-bit VST instrument plugins is required.

An instance of EXD-80 uses approximately 12Mb of memory when loaded. The minimum recommended CPU speed is 1GHz (Intel x86).

## Installation/Removal

Extract the archive to your host's VST plugin directory. To uninstall EXD-80 simply delete the DLL file and associated sub-directory, the plugin does not write to the registry or create any hidden files on your system.

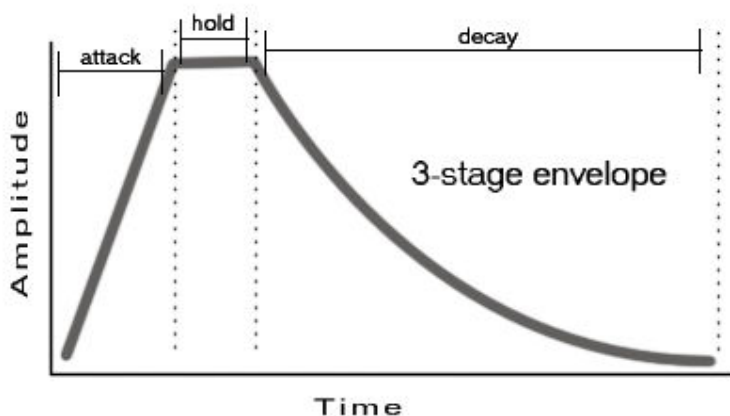
## Usage



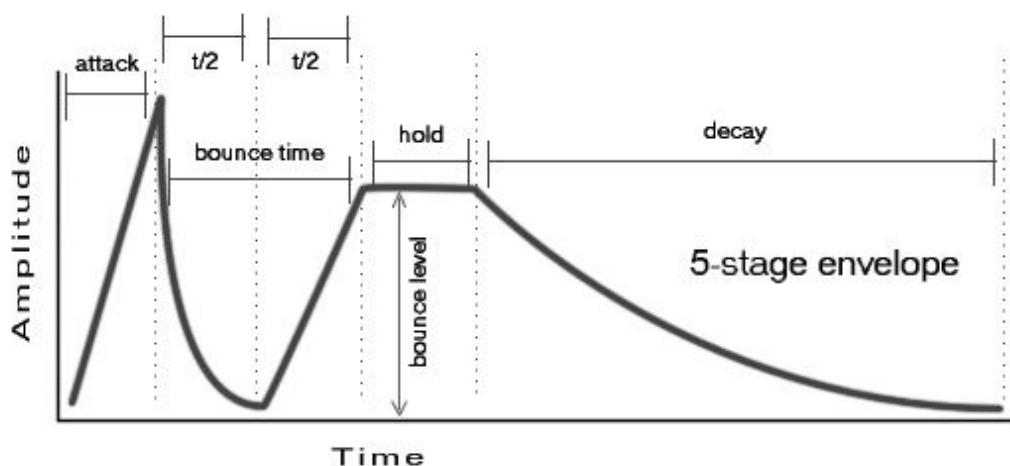
***Warning! – EXD-80 is capable of producing extremely loud signals at high resonance settings on module filters which may damage your speakers or hearing.***

## Modulation Envelopes

Drum modules in EXD-80 utilise 3-stage or 5-stage modulation envelopes to control pitch, amplitude or filter frequency. All envelopes except the snare drum's snares amplitude envelope and each of the percussion modules' amplitude envelopes use the 3-stage envelope:




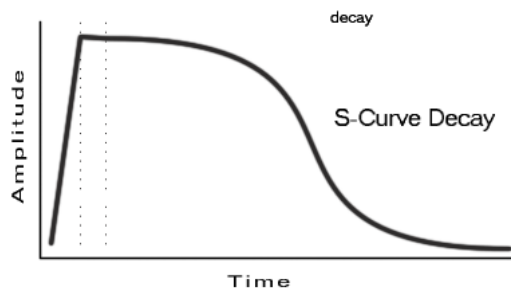
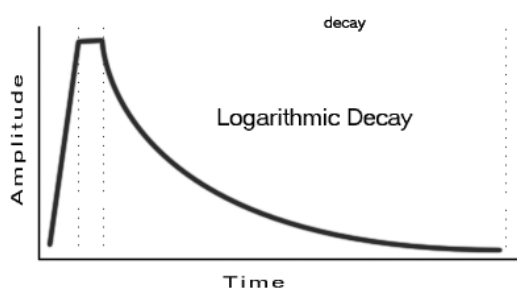
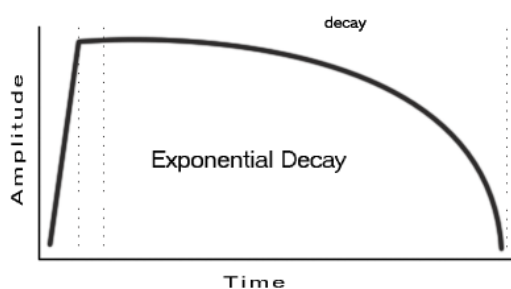
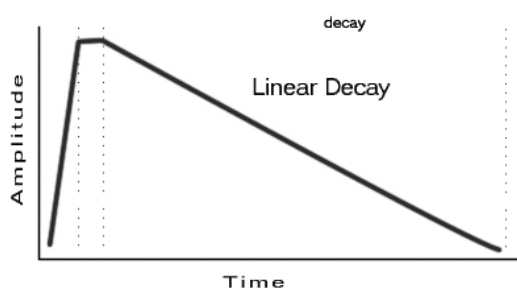
The 5-stage envelope has 2 extra “bounce” stages, which can be used to create an echo or flam (grace-note) effect (with short “bounce time” < 100 milliseconds) when used as an amplitude envelope:



The “bounce level” parameter controls the amplitude of the echo effect.

### Decay Segment Response Curves

Both the 3-stage and 5-stage modulation envelopes’ decay segment shape can be set to one of the following four options by left-clicking and horizontal dragging the  button on each modulation envelope’s controls:



## Common User Interface Items



The volume, pan and output-assignment controls for each of the modules are shown above. Each can be adjusted by left-clicking the control and dragging horizontally while holding down the left mouse button.



The velocity sensitivity control adjusts how much the maximum amplitude of the modulation envelope changes as the MIDI note velocity changes. When the velocity sensitivity is set to 0%, the envelope amplitude will always rise to its maximum level regardless of the MIDI note velocity. When the velocity sensitivity is set to 100% the envelope maximum amplitude will correspond to the MIDI note velocity.

## Kick Drum Module



### Amplitude Section (overall amplitude envelope of kick drum sound):

Velocity Sensitivity control (click & vertical drag)

3-stage envelope knobs: attack time, hold time, decay time, decay shape (click & horizontal drag)

### Pitch Section (drum pitch and pitch envelope):

Velocity Sensitivity control (click & vertical drag)

3-stage envelope knobs: attack time, hold time, decay time, decay shape (click & horizontal drag)

Pitch knob: adjust fundamental pitch of drum

Env Amt knob: controls the amount of pitch modulation by the pitch envelope

### Low-pass Filter Section:

Velocity Sensitivity control (click & vertical drag)

3-stage envelope knobs: attack time, hold time, decay time, decay shape (click & horizontal drag)

Cutoff knob: sets the cutoff frequency of the low-pass filter

Env Amt knob: controls the amount of filter cutoff frequency modulation by the filter envelope

### Noise Modulation Section:

Amount knob: adjusts the amount of amplitude modulation by the white noise source.

## Snare Drum Module



EXD-80's snare drum sound is synthesized by simulating the sound of the top-head/batterhead (the membrane on top of the snare drum) and the snares (the wires that vibrate against the bottom of the snare drum). The user interface features separate controls to shape the batterhead and snares sounds.

### **Amplitude Section (overall amplitude envelope of top-head/batterhead sound):**

Velocity Sensitivity control (click & vertical drag)

3-stage envelope knobs: attack time, hold time, decay time, decay shape (click & horizontal drag)

### **Batterhead Pitch Section (drum pitch and pitch envelope):**

Velocity Sensitivity control (click & vertical drag)

3-stage envelope knobs: attack time, hold time, decay time, decay shape (click & horizontal drag)

Pitch knob: adjust fundamental pitch of drum

Env Amt knob: controls the amount of pitch modulation by the pitch envelope

FM Freq knob: The snare drum module uses a sine wave oscillator as a fixed modulation source for the batterhead oscillator pitch to enable the creation of metallic-sounding effects. This knob adjusts the pitch of the modulating oscillator.

FM Amt knob: Adjusts the amount of frequency modulation of the batterhead sound caused by the modulation oscillator.

### **Snares Amplitude Section (overall amplitude envelope of snares sound):**

Velocity Sensitivity control (click & vertical drag)

5-stage envelope knobs: attack time, bounce time (please refer to the Modulation Envelopes section above), bounce level/amount, hold time, decay time, decay shape (click & horizontal drag)

X-Mix knob: adjusts the level balance between the batterhead sound and the snares sound.

### **Snares EQ Section:**

HP Freq knob: set the hi-pass filter cutoff frequency for the snares sound

LP Freq knob: set the low-pass filter cutoff frequency for the snares sound



## Hi-hat Module



The Hi-Hat module simulates both closed and open hi-hat sounds. The open and closed hi-hat sounds are mapped to separate MIDI key numbers (set in the MIDI note mapping dialog). The hi-hat module controls affect both the open and closed hi-hat sounds simultaneously.

### Amplitude Section (overall amplitude envelope of hi-hat sound):

Velocity Sensitivity control (click & vertical drag)

3-stage envelope knobs: attack time, hold time, decay time, decay shape (click & horizontal drag)

### Color Section (adjust harmonic content of the hi-hat sound):

Pitch knob: adjust the pitch of the hi-hat module oscillator

FM Freq knob: The hi-hat drum module uses a square wave oscillator as a fixed modulation source for the hi-hat oscillator pitch to enable the creation of metallic-sounding effects. This knob adjusts the pitch of the modulating oscillator.

FM Amt knob: Adjusts the amount of frequency modulation caused by the modulation oscillator.

Noise knob: In addition to the modulating square wave oscillator, the hi-hat module features a white-noise modulation source to further color the hi-hat sound. This knob adjusts the amount of frequency modulation caused by the white-noise source.

Sizzle knob: Basically a hi-pass filter cutoff frequency knob for the tail of the open hi-hat sound

Stick knob: Band-pass filter frequency knob for adjusting the pitch of the initial hi-hat transient sound.

## Percussion Modules



EXD-80 features five individual percussion synth modules. The radio buttons numbered 1-5 in the top-right of the Percussion section select which module is currently being edited.

### Amplitude Section (overall amplitude envelope of drum sound):

Velocity Sensitivity control (click & vertical drag)

5-stage envelope knobs: attack time, bounce time (please refer to the Modulation Envelopes section above), bounce level/amount, hold time, decay time, decay shape (click & horizontal drag)

### **Pitch Section (drum pitch and pitch envelope):**

Velocity Sensitivity control (click & vertical drag)

3-stage envelope knobs: attack time, hold time, decay time, decay shape (click & horizontal drag)

Pitch knob: adjust fundamental pitch of drum

Env Amt knob: controls the amount of pitch modulation by the pitch envelope

FM Freq knob: Each percussion module uses an oscillator (0.006 Hz – 14kHz) as a fixed modulation source for the main oscillator pitch. This knob adjusts the pitch of the modulating oscillator.

FM Amt knob: Adjusts the amount of frequency modulation caused by the modulation oscillator.

Osc Wave selector: (click & horizontal drag) Selects the waveform of the percussion module's main oscillator

FM Wave selector: (click & horizontal drag) Selects the waveform of the main oscillator's frequency modulation source. The waveform options are shown below:



Sine Wave



Saw Wave



Ramp (rising saw wave)



Triangle Wave



Square Wave



White Noise



Pink Noise

Random knob: Controls the amount of random variation of the FM oscillator's pitch (with each MIDI note-on event the pitch of the FM oscillator will be offset by a random amount).

### **Filter Section:**

Velocity Sensitivity control (click & vertical drag)

3-stage envelope knobs: attack time, hold time, decay time, decay shape (click & horizontal drag)

Freq knob: sets the cutoff frequency of the filter

Reso knob: adjusts the resonance of the filter

Env Amt knob: controls the amount of filter cutoff frequency modulation by the filter envelope

Filter Type Rotary Selector: Select the filter type (Low-pass, Hi-pass, Band-pass, Notch)

dB/Oct selector: (click & horizontal drag) Selects the filter slope, decibels per octave (6, 12, 18, 24, 30, 36 dB/octave)

## Effects

Each of EXD-80's four stereo outputs features an effects section consisting of a Waveshaper and a Granulator. A waveshaper creates distortion effects. A granulator breaks up the sound into short pieces (grains) and plays them back superimposed and crossfaded over each other, creating a delay-like effect that can produce some interesting textures/effects.



### **Output Pair**

Output selector: The radio buttons numbered 1-2, 3-4, 5-6, 7-8 at the top of the Effects section select which stereo output pair effects are currently being edited.

### **Waveshaper Section:**

Waveshaper Type Rotary Selector: Select one of the waveshaper preset modes or turn the effect off. The blue LED is illuminated when the waveshaper is on.

### **Granulator Section:**

Dry/Wet knob: Adjust the balance of the un-processed sound with the granulated sound. Setting the knob to 0 will turn the granulator off. When the granulator is on (knob value greater than 0) the blue LED will illuminate.

Pitch knob: Adjust the pitch shift amount of the grains

Pitch Variation knob: Set the amount of random variation of the grain pitch

Gran Size knob: Adjust the length of each grain (0.023 milliseconds – 200 milliseconds).

Gran Size Var knob: Set the amount of random variation of the grain length (0-100% of Gran Size)

Envelope Shape selector: select the amplitude envelope shape of each grain

## **MIDI/Automation**

### MIDI note assign dialog

Each of the 9 different drum sounds (kick, snare, closed hihat, open hihat, percussion modules 1-5) is assigned its own MIDI note number. Each patch can have different MIDI note assignments. The MIDI note assignments for the current patch can be set in the MIDI note assignment dialog, accessed by clicking the button shown below:







Clicking on the MIDI note number corresponding to each drum sound will bring up a pop-up menu to enable note number selection (MIDI note number 36 = Note C3). To close the dialog, click on the brown “X” key below the dialog.

## Automation

EXD-80 supports VST host automation of a large number of its parameters. A table of the parameters and their corresponding MIDI continuous controller (CC) numbers is shown below:

PARAMETER	MIDI CC#	PARAMETER	MIDI CC#	PARAMETER	MIDI CC#
KICK VOL	11	PERC2 BOUNCE TIME	47	GRAN1-2 MIX	91
KICK PAN	12	PERC2 FILTER FREQ	48	GRAN1-2 PITCH	92
KICK PITCH	13	PERC2 FILTER RES	49	GRAN1-2 PITCH VAR	93
SNARE VOL	14	PERC2 FM RANDOM FRQ	50	GRAN1-2 GRAIN SIZE	94
SNARE PAN	15	PERC3 VOL	51	GRAN1-2 GRAIN SZ VAR	95
SNARE BTHEAD PITCH	16	PERC3 PAN	52	WAVESHAPER1-2 TYPE	96
SNARE FM FREQ	17	PERC3 PITCH	53	GRAN3-4 MIX	97
SNARE FM AMOUNT	18	PERC3 FM FREQ	54	GRAN3-4 PITCH	102
SNARE BOUNCE TIME	19	PERC3 FM AMT	55	GRAN3-4 PITCH VAR	103
SNARE BOUNCE LEVEL	20	PERC3 BOUNCE LEVEL	56	GRAN3-4 GRAIN SIZE	104
SNARE HP FREQ	21	PERC3 BOUNCE TIME	57	GRAN3-4 GRAIN SZ VAR	105
SNARE LP FREQ	22	PERC3 FILTER FREQ	58	WAVESHAPER3-4 TYPE	106
HIHATS VOL	23	PERC3 FILTER RES	59	GRAN5-6 MIX	107
HIHATS PAN	24	PERC3 FM RANDOM FRQ	60	GRAN5-6 PITCH	108
HIHATS PITCH	25	PERC4 VOL	61	GRAN5-6 PITCH VAR	109
HIHATS FM FREQ	26	PERC4 PAN	62	GRAN5-6 GRAIN SIZE	110
HIHATS FM AMOUNT	27	PERC4 PITCH	63	GRAN5-6 GRAIN SZ VAR	111
HIHATS NOISE AMT	28	PERC4 FM FREQ	64	WAVESHAPER5-6 TYPE	112
HIHATS SIZZLE	29	PERC4 FM AMT	75	GRAN7-8 MIX	113
HIHATS STICK	30	PERC4 BOUNCE LEVEL	76	GRAN7-8 PITCH	114
PERC1 VOL	31	PERC4 BOUNCE TIME	77	GRAN7-8 PITCH VAR	115
PERC1 PAN	32	PERC4 FILTER FREQ	78	GRAN7-8 GRAIN SIZE	116
PERC1 PITCH	33	PERC4 FILTER RES	79	GRAN7-8 GRAIN SZ VAR	117
PERC1 FM FREQ	34	PERC4 FM RANDOM FRQ	80	WAVESHAPER7-8 TYPE	118
PERC1 FM AMT	35	PERC5 VOL	81		
PERC1 BOUNCE LEVEL	36	PERC5 PAN	82		
PERC1 BOUNCE TIME	37	PERC5 PITCH	83		
PERC1 FILTER FREQ	38	PERC5 FM FREQ	84		
PERC1 FILTER RES	39	PERC5 FM AMT	85		
PERC1 FM RANDOM FRQ	40	PERC5 BOUNCE LEVEL	86		
PERC2 VOL	41	PERC5 BOUNCE TIME	87		
PERC2 PAN	42	PERC5 FILTER FREQ	88		
PERC2 PITCH	43	PERC5 FILTER RES	89		
PERC2 FM FREQ	44	PERC5 FM RANDOM FRQ	90		
PERC2 FM AMT	45				
PERC2 BOUNCE LEVEL	46				

## Credits

EXD-80 v1.02 created by Third Harmonic Studios (Jeremy Baraba & Justin Sutherland)

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Thanks to the following developers for modules used in this VST:

David Haupt ([www.dehaupt.com](http://www.dehaupt.com))

Kelly Lynch ([www.rubyhex.com](http://www.rubyhex.com))

Ralph Gonzalez