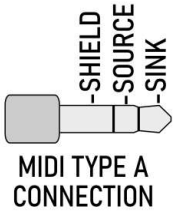
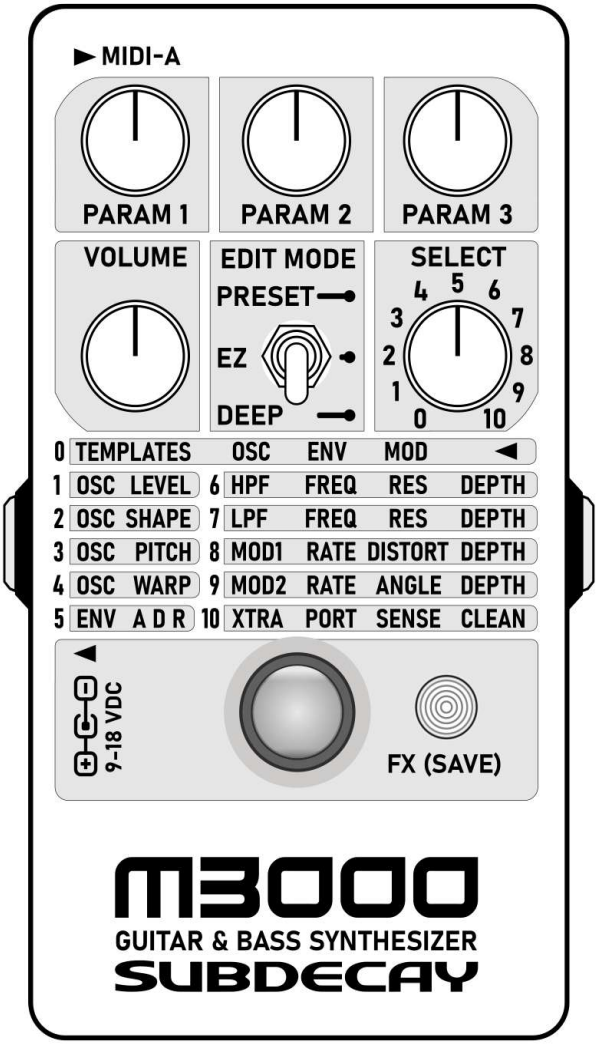
SUBDECAY M3000

Guitar and Bass Synthesizer



MIDI TYPE A CONNECTION



User guide 1.00A

Comprehensive User Guide

GETTING STARTED:

IF YOU ARE USING THE M3000 WITH BASS GUITAR SEE PAGE 12 FOR SETUP OPTIONS. USE OPTION 4 TO SETUP DEFAULT BASS GUITAR SETTINGS.

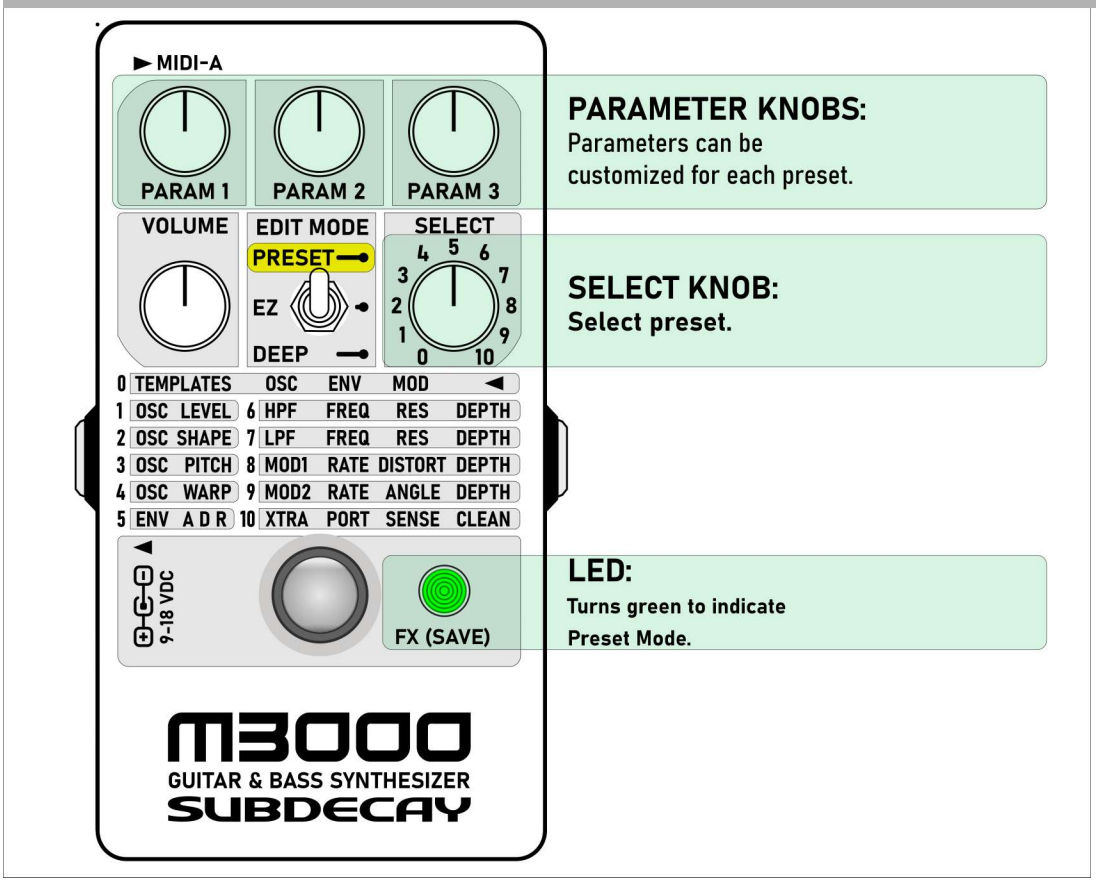
IF THE M3000 IS STRUGGLING TO SUSTAIN SYNTH NOTES SEE PAGE 12 FOR SETUP OPTIONS AND USE OPTION 6 TO SETUP INPUT GAIN.
THEN RESTART AND USE OPTION 5 TO SETUP THE PITCH TRACKING FILTERS.

CONTENTS:

INTRODUCTION:

The M3000 is our followup to the M3, now with MIDI, presets, more modulation & oscillator options and more control. It's a monophonic guitar synthesizer for guitar and bass.

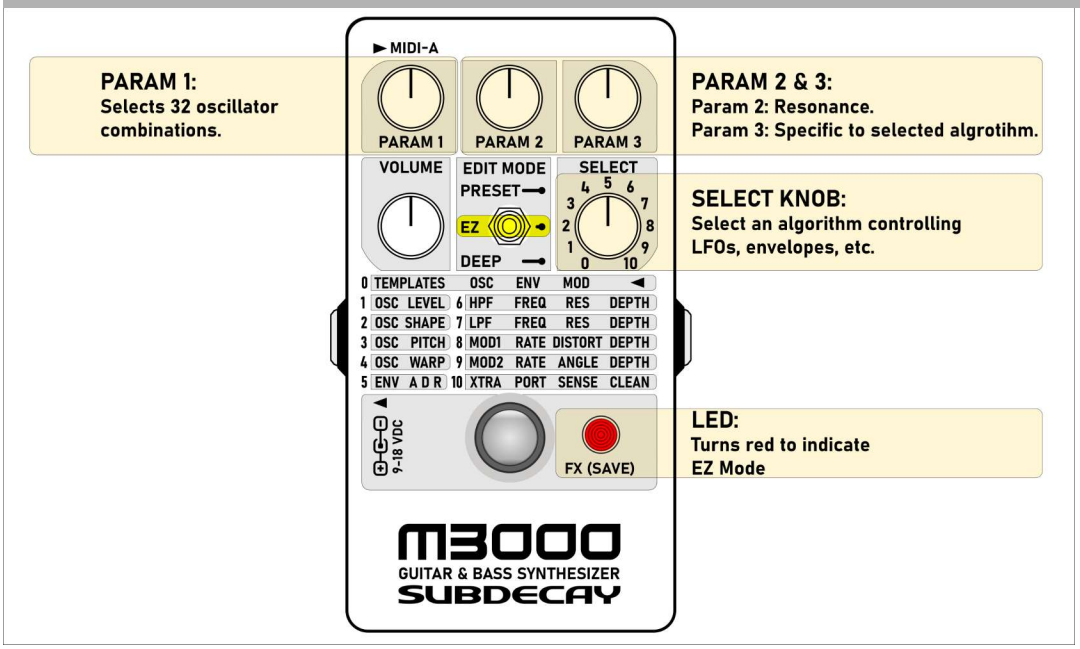
Preset MODE



With the EDIT MODE switch set to PRESET use the select knob to load a preset.

The PARAM knobs can be customized for each preset.
To learn more about assigning PARAM knob functions see the SAVE A PRESET section.

EZ MODE



Set the EDIT MODE switch to EZ for live use or to get a great synth sound without a lot of tweaking. This mode is similar to how the M3 worked.
Use PARAM 1 to choose between 20 different oscillator settings.
Meanwhile the SELECT knob to switch between 11 different filter and envelope settings.
PARAM 2 & 3 offer additional tweaks based on the select knob's setting.

If you save a preset from EZ mode the PARAM 2&3 knobs will be assigned to the same settings. while Param 1 will be assigned to an octave shift.

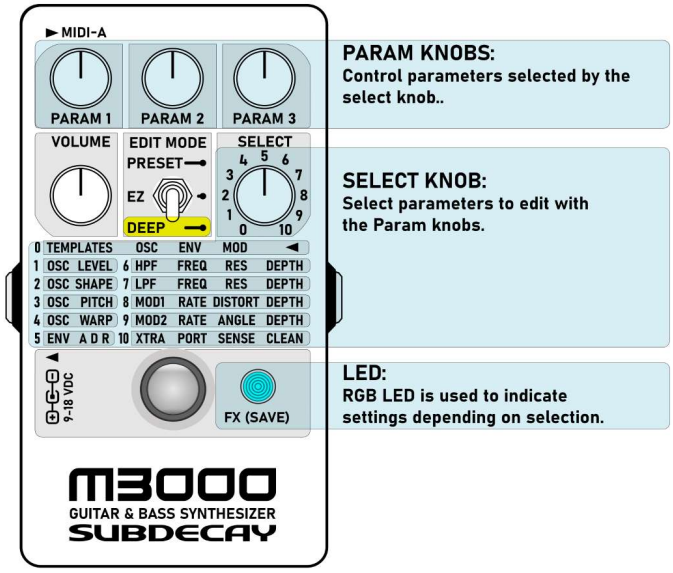
PARAM 1 OSCILLATORS

1	Saw waves
2	Saw octaves
3	Square waves
4	Square octave
5	Saw bass
6	PWM bass 1
7	PWM bass 2
8	Alpha mod bass
9	Square sync bass
10	Square sync octaves

11	Square sync envelope
12	Square & 6th harmonic
13	Harmonic series square
14	Saw & 9th harmonic ring mod
15	Square & 7th harmonic
16	Square & 11th harmonic
17	Saw power chord
18	PWM power chord
19	Maj chord
20	Min chord

	SELECT knob	PARAM 2	PARAM 3
0	Fixed filter	LPF res	LPF cutoff freq
1	Fixed filter with portamento	LPF res	LPF cutoff freq
2	Soft attack	LPF res	LPF cutoff freq
3	Filter decay 1	LPF res	Env decay
4	Filter decay 2	LPF res	Env sus/saturate
5	Filter decay 3	LPF res	LPF cutoff freq
6	High pass filter decay	HPF res	Env decay
7	Filter Modulation	LPF res	LFO rate
8	Pitch vibrato	LPF res	LFO rate
9	Dual Filter	LPF res	Env sus/saturate
10	Slow attack	LPF res	Env attack

DEEP MODE



Parameter list

0	TEMPLATES	OSC	ENV	MOD	◄		
1	OSC LEVEL	6	HPF	FREQ	RES	DEPTH	
2	OSC SHAPE	7	LPF	FREQ	RES	DEPTH	
3	OSC PITCH	8	MOD1	RATE	DISTORT	DEPTH	
4	OSC WARP	9	MOD2	RATE	ANGLE	DEPTH	
5	ENV A D R	10	XTRA	PORT	SENSE	CLEAN	

In deep mode you have access to these parameters. Use the SELECT knob to choose which parameters you want to change.
For example if you want to change the oscillator pitch turn the SELECT knob to 3. Then PARAM 1 2 & 3 control the pitch of the corresponding oscillator.

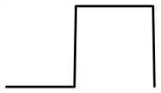
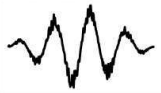
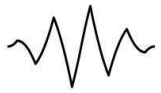
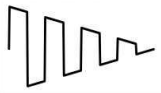
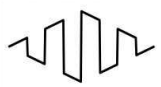
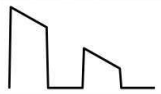
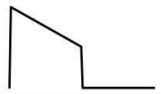
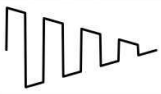
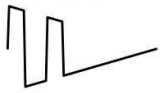
DEEP mode gives you access to much more control than EZ mode. DEEP mode can be used to tweak sounds created in EZ mode or presets from PRESET mode.

TEMPLATES
To really dive in and create from scratch start with the Select knob set to (0) Templates. Then use the PARAM knobs to quickly change between presets for Oscillators (PARAM 1) Envelopes (PARAM 2) and Modulation. (PARAM 3)
Each knob has about 100 different options. Find something close to what you are looking for and then change the select knob to select a different category of settings.

	SELECT	PARAM1	PARAM 2	PARAM 3
1	OSC LEVEL	OSC 1 LEVEL	OSC 2 LEVEL	OSC 3 LEVEL
2	OSC SHAPE	OSC 1 SHAPE(WAVEFORM)	OSC 2 SHAPE(WAVEFORM)	OSC 2 SHAPE(WAVEFORM)
3	OSC PITCH	OSC 1 PITCH (OCTAVE)	OSC 2 PITCH (HALF STEP)	OSC 1 PITCH (HALF STEP)
4	OSC WARP*	OSC 1 WARP (PWM/MOD/SYNC)	OSC 1 WARP (PWM/MOD/SYNC)	OSC 1 WARP (PWM/MOD/SYNC)
5	ENV ADR	ENVELOPE ATTACK	ENVELOPE DECAY	ENVELOPE RATIO
6	HPF	HPF CUTOFF FREQUENCY	HPF RESONANCE	HPF ENV DEPTH
7	LPF	LPF CUTOFF FREQUENCY	LPF RESONANCE	LPF ENV DEPTH
8	MOD1*	LFO RATE	LFO DISTORTION	LFO DEPTH
9	MOD2**	LFO RATE	LFO PHASE ANGLE	LFO DEPTH
10	XTRA	PORTAMENTO	SENSITIVITY	CLEAN SIGNAL

* **OSC WARP** is a varies the shape of the waveform. For example when using the pulse wave WARP varies the pulse width modulation.
* **MOD1** routing is set in TEMPLATES with the PARAM 3 knob. If no modulation is routed, changing the MOD1 depth setting will automatically rout the MOD1 LFO to pitch modulation.
* **MOD2** routing is set in TEMPLATES with the PARAM 3 knob. If no modulation is routed, changing the MOD2 depth setting will automatically rout the MOD2 LFO to Oscillator warp modulation?
For more control over modulation use the MIDI editor.

OSCILLATOR WAVE FORMS

WAVE NUM/SHAPE	DIAGRAM	WARP MODULATION
0: SAW		N/A Classic saw wave, a mainstay of analog synths and a primary sound from the MS20
1: PULSE		PULSE WIDTH MODULATION Another waveform from the MS20, but no need for patch cables to modulate the pulse width.
2: TRIANGLE		N/A Also found on the MS20
3: NOISE SPECTRA		CHANGES THE NOISE RESONANCE
4: SAW/NOISE		CHANGES THE NOISE BLEND
5: TRI SYNC1		CHANGES THE SYNC FREQUENCY
6: TRI SYNC2		CHANGES THE SYNC FREQUENCY
7: SQR SYNC1		CHANGES THE SYNC FREQUENCY
8: SQR SYNC2		CHANGES THE SYNC FREQUENCY
9: SAW MOD1		CHANGES MODULATION SIMILAR TO PWM
10: SAW MOD2		CHANGES MODULATION SIMILAR TO PWM
11: ALPHA MOD1		CHANGES MODULATION SIMILAR TO PWM
12: ALPHA MOD2		CHANGES MODULATION SIMILAR TO PWM
13: RING MOD SAW		Ring modulation using the previous oscillator as the carrier If a ring modulation waveform is selected for oscillator 1 it uses the guitar input as the carrier.
14: RING MOD TRI		
15: RING MOD PULSE		

SAVING A PRESET:

KNOB ASSIGNMENTS: The M3000 uses the edit switch and select knob settings to determine knob assignments. These settings will determine your preset's PARAM knob functions during step one. There are caveats for a few settings, like saving from DEEP mode with SELECT set to (0)Templates will turn off all PARAM controls.

Saving a preset can be done at any time:

1. **Press and hold the FX switch for two seconds.**
   This copies all of your current settings. Param knob assignments are determined the EDIT MODE and SELECT settings.
   The LED will flash to indicate the pedal is waiting to save your preset.
   This will timeout after 10 seconds if you decide not to save.
2. **Use the SELECT knob to choose a spot to save your preset.**
   OPTIONAL: While the LED is flashing you can change the EDIT MODE to PRESET which lets you hear the preset will be replaced before saving.
3. **Press the FX switch again to save your preset.**

Your Preset can be recalled at any time with the select knob while the EDIT MODE switch is set to PRESETS.

If you initiate step 1 while in EZ MODE the PARAM 2 & 3 functionality will carryover to your preset. PARAM1 will shift the oscillators in octave increments.

PARAM knob assignments if saved from DEEP mode:

	SELECT	PARAM1	PARAM 2	PARAM 3
0	TEMPLATES	NULL	NULL	NULL
1	OSC LEVEL	OSC 1 LEVEL	OSC 2 LEVEL	OSC 3 LEVEL
2	OSC SHAPE	OSC 1 SHAPE(WAVEFORM)	OSC 2 SHAPE(WAVEFORM)	OSC 2 SHAPE(WAVEFORM)
3	OSC PITCH	OCTAVE SHIFT OF ALL OSCILLATORS	OSC 2 PITCH (HALF STEP)	OSC 1 PITCH (HALF STEP)
4	OSC WARP*	OSC 1 WARP (PWM/MOD/SYNC)	OSC 1 WARP (PWM/MOD/SYNC)	OSC 1 WARP (PWM/MOD/SYNC)
5	ENV ADR	ENVELOPE ATTACK	ENVELOPE DECAY	ENVELOPE RATIO
6	HPF	HPF CUTOFF FREQUENCY	HPF RESONANCE	HPF ENV DEPTH
7	LPF	LPF CUTOFF FREQUENCY	LPF RESONANCE	LPF ENV DEPTH
8	MOD1*	LFO RATE	LFO DISTORTION	LFO DEPTH
9	MOD2**	LFO RATE	LFO PHASE ANGLE	LFO DEPTH
10	XTRA	PORTAMENTO	SENSITIVITY	CLEAN SIGNAL

MIDI SYNTHESIZER MODE:

You can also use the M3000 as a MIDI controlled synthesizer.

Other than the normal stuff you use with guitar (cables, power supply, etc) you will need:

- An M3000 (duh)
- A MIDI controller or keyboard with a MIDI out port.
- A MIDI cable.
- A 1/8" MIDI type A adapter to plug into the pedal's MIDI input.

Connect this all up and press any note on the keyboard. The synthesizer should start right up.

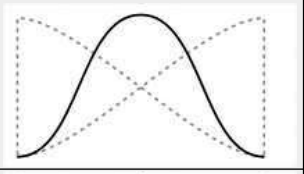
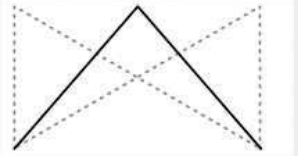
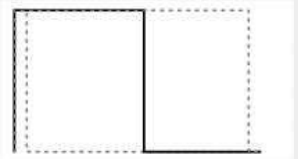
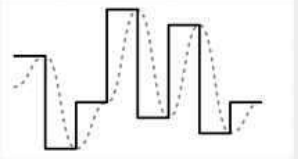
By default the M3000 is set to MIDI channel 1 as are most MIDI controllers. If pressing a key doesn't activate the synthesizer a channel mismatch is the most likely reason. See the Setup Option page for changing MIDI channels.

While Synthesizer mode is active it uses the same presets used for guitar and bass. The envelopes will act like traditional ADSR envelopes.

NOTE: Advanced MIDI Concepts Ahead
The following pages cover some features in detail, some of which can only be directly edited via the MIDI editor. Consider this section optional reading unless you require a specific advanced feature or wish to understand the underlying mechanics.

MOD 1 - PHASE DISTORTION LFO

MOD 1 has 4 LFO shape options. Each shape can be further customized with phase distortion.

MOD 1 NUM/SHAPE	DIAGRAM	DISTORTION
0: SINE		Sine wave LFO when distortion is set to 50% Distortion control turns it into a sine based ramp or saw LFO.
1: TRIANGLE		Triangle LFO when distortion is set to 50% Distortion control turns it into a ramp or saw LFO.
2: PULSE/SQUARE		Square wave LFO when distortion is set to 50% Distortion control varies the pulse width.
3: RANDOM		Random Sample/hold when distortion is set to 0% Increasing distortion smooths the edges of the LFO.

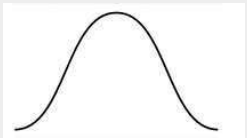
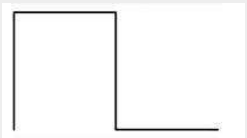
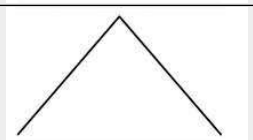
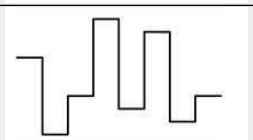
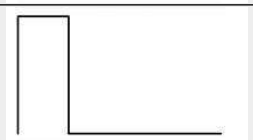
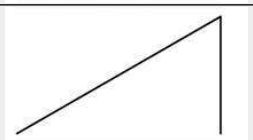
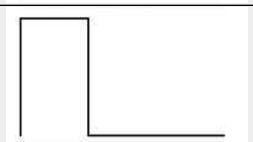
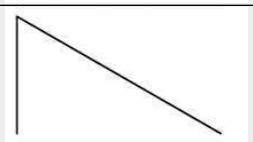
—— NON-DISTORTED
····· DISTORTED

MOD1 LFOs can be routed to:

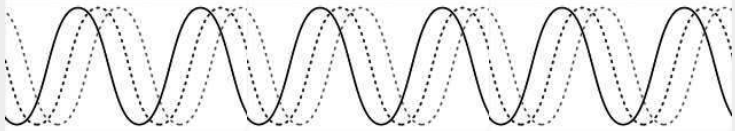
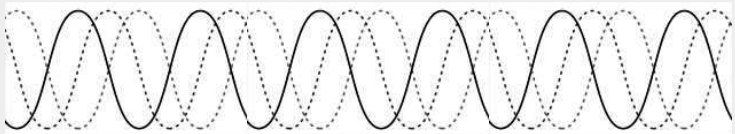
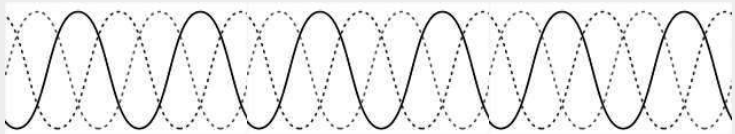
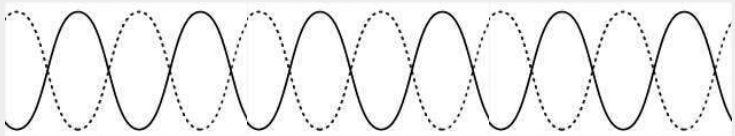
- Pitch Modulation (all oscillators)
- LPF Modulation
- HPF Modulation
- OSC1 warp
- OSC2 warp
- OSC3 warp

MOD 2 – THREE PHASE LFO

MOD2 has 8 LFO shape options.

MOD 2 NUM/SHAPE	DIAGRAM		
0: SINE		4: SQUARE	
1: TRIANGLE		5: RANDOM	
2: 25% PULSE		6: RAMP	
3: 33% PULSE		7 SAW	

MOD 2 is a three phase LFO. What that really means is that it is three LFOs running in sync with a phase delay. The delay can be varied fro 0 to 180 degrees.

60 DEGREE PHASE DELAY	
90 DEGREE PHASE DELAY	
120 DEGREE PHASE DELAY	
180 DEGREE PHASE DELAY	

MOD 2 can be routed to:

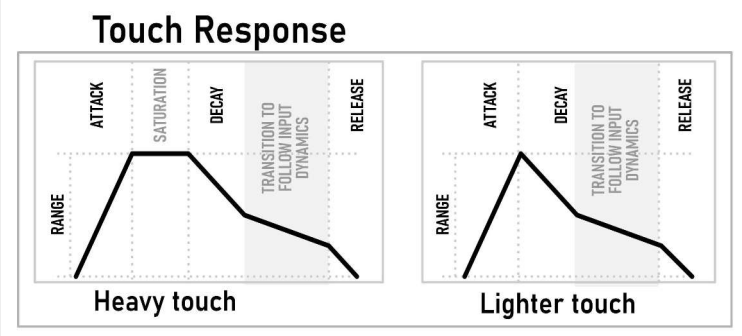
- Individual oscillator warp
- Individual oscillator pitch
- Individual oscillator level

ENVELOPES

The M3000 has tree envelopes

- VCA envelope controls the output amplitude.
- FILTER envelope is routed for the high pass and/or low pass filter.
- ENVELOPE 3 can be routed to Oscillator warp, pitch and levels.

When used as a guitar synth these envelopes function as a hybrid of an ADSR envelope and an envelope follower.



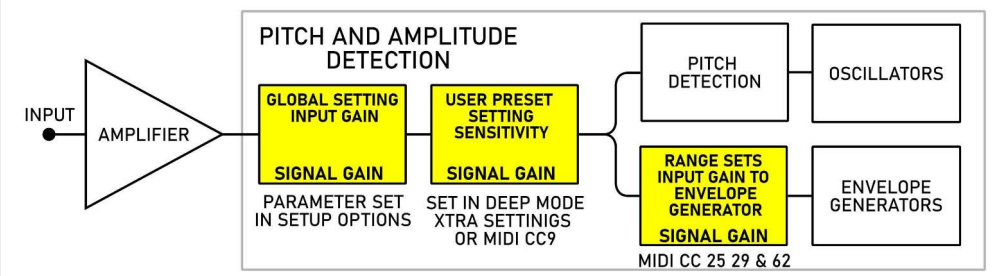
Getting the Best Response: Input Gain, Sensitivity, and Range

Your guitar's signal goes through a few stages to control the synth's response. Here's how they work together:

1.**Global Input Gain (The Master Input level):** Set this up when you first get the pedal (see the next page for setup options) This adjusts the overall level coming from your guitar. Get this right so the pedal works well with all its built-in sounds. It ensures the pedal correctly understands your playing dynamics (how hard or soft you play).

2.**Preset Sensitivity (Fine-Tuning per Sound):** Each synth sound (preset) can have its own **Sensitivity** setting. This lets you fine-tune how easily that particular sound triggers, without affecting the global setting.

3.**Envelope Range (Controlling the Effect Itself):** Each envelope (for VCA, VCF, etc.) has its own **Range** control. Think of this as the effect's volume knob. A higher Range means your playing dynamics will create a bigger effect (e.g., a wider filter sweep). A lower Range makes the effect more subtle.



In short: Set the Global Gain for your guitar, then use Sensitivity per preset, and finally adjust the Range to shape how dramatic each effect is.

When used as a MIDI synth the envelops function as ADSR envelopes.

SETUP OPTIONS: FACTORY RESET AND STARTUP OPTIONS

SETUP OPTIONS are used to change global parameters like the MIDI channel or initiate a factory reset.

It's also where you can customize the pedal for your guitar or bass. There are a few things you should do when you first get your M3000 to set up the pedal for your instrument and playing style.

When powering up the pedal the LED will flash 5 times. Access setup mode by pressing the FX(SAVE) switch while the LED is flashing.

Options are chosen with the select knob.

The LED will display a series of flashes to confirm the option selected.

To use Setup Mode follow these steps and see the table below.

1. Power up the pedal.
2. Hold the FX switch while the pedal powers up.
3. Choose an action with the select knob. The LED will flash to confirm your selection.
4. Press the FX(SAVE) switch again to initiate the action

Select knob	LED color	Flash qty	Action after pressing FX switch.
0	Green	2	Factory reset for guitar. The M3000 will return all presets and setup options to their factory state.
1	Green	3	Restores setup options for guitar, but does not erase user presets.
2	Green	4	reserved
3	Blue	2	Factory reset for Bass. The M3000 will load settings and presets for bass.
4	Blue	3	Restores setup options for bass, but does not erase user presets.
5	Blue	4	Pedal will start up normally. Use Param 1 to avoid envelope mistriggers and Param 2 to adjust a low pass filter.
6	Red	1	Set sensitivity. Use Param 1 to adjust the sensitivity. The LED will light up green according to the input signal. It will turn red when it is near maximum. Adjust the knob until the LED only turns red when you play really hard. Press the FX switch again to finish.
7	Red	2	Set MIDI Channel 1-10. Set the select knob from 1-10 to select a midi channel. Press the FX switch again to save.
8	Red	3	Set MIDI Channel 11-16. Set the select knob from 1-6 to select a midi channel. Press the FX switch again to save.
9	Red	4	Reserved - troubleshooting
10	Red	5	EXIT.

Option 5: Pedal starts up normally, but PARAM 1 and PARAM 2 are used to adjust the input for tracking.

The VOLUME knob will act normally. The Select knob will load presets.

Param 1: Adjust for mistriggers. Play lower notes and turn the knob down until there are no envelope mistriggers.

Param 2: Low pass filter. Turn this knob just high enough so that the highest notes on the fret board are detected.

Press the FX button to finish.

MIDI IMPLEMENTATION: CC LIST

CC	RANGE	PARAMETER
0	0-127	Load factory presets
1	0-127	Param 1 (assigned)
3	0-127	Param 1 knob
4	0-127	Param 2 knob
5	0-127	Param 3 knob
6	0 off | >0 on	Legato
7	0-127	volume
8	0-127	clean level
9	0-127	sensitivity
11	0-127	Low Pass Filter Freq
12	0-127	Low Pass Filter Resonance
13	0-127	Low Pass filter Env Amount
14	0-127	Low Pass Filter MOD 1 Amount
15	0-127	Low Pass Filter Pitch Follow
16	0-127	High Pass Filter Freq
17	0-127	High Pass Filter Resonance
18	0-127	High Pass Filter Env Amount
19	0-127	High Pass Filter MOD 1 Amount
20	0-30	Assign Param 1 (for Preset Mode)
21	0-30	Assign Param 2 (for Preset Mode)
22	0-30	Assign Param 3 (for Preset Mode)
23	0-127	VCA Attack
24	0-127	VCA Decay
25	0-127	VCA Sustain
26	0-127	VCA Release
27	0-127	VCF Attack
28	0-127	VCF Decay
29	0-127	VCF Sustain
30	0-127	VCF Release
33	0-127	OSC 1 Level
34	0-127	OSC 2 Level
35	0-127	OSC 3 Level
37	0-15	OSC 1 Wave Shape
38	0-15	OSC 2 Wave Shape
39	0-15	OSC 3 Wave Shape
40	0-4	OSC 1 Pitch
41	0-60	OSC 2 Pitch
42	0-60	OSC 3 Pitch
43	0-127	OSC 2 Fine Tune
44	0-127	OSC 3 Fine Tune
46	0-11	Pitch Bend Range
49	0 off | >0 on	Retrigger LFO on Attack
50	0-3	MOD 1 Shape
51	0-127	MOD 1 Rate
53	0-127	MOD 1 Distortion

CC	RANGE	PARAMETER
54	0-7	MOD 2 Shape
55	0-127	MOD 2 Rate
56	0-127	MOD 2 LFO offset
59	0-127	Portamento
58	0-127	MOD 1 > Pitch
61	0-127	ENV 3 Attack
62	0-127	ENV 3 Decay
63	0 up | 1 down	ENV 3 UP/DOWN
65	n/a	reserved
	Oscillator 1 Modulation	
67	0-127	MOD 2 > Pitch
68	0-127	ENV 3 > Pitch
69	0-127	MOD1 > Warp
70	0-127	MOD 2 > Warp
71	0-127	Env 3 > Warp
72	0-127	Warp Manual
73	0-127	MOD 2 > Level
74	0-127	ENV 3 > Level
	Oscillator 2 Modulation	
75	0-127	MOD 2 > Pitch
76	0-127	ENV 3 > Pitch
77	0-127	MOD1 > Warp
78	0-127	MOD 2 > Warp
79	0-127	Env 3 > Warp
80	0-127	Warp Manual
81	0-127	MOD 2 > Level
82	0-127	ENV 3 > Level
83	0-127	MOD 2 > Pitch
	Oscillator 3 Modulation	
84	0-127	ENV 3 > Pitch
85	0-127	MOD1 > Warp
86	0-127	MOD 2 > Warp
87	0-127	Env 3 > Warp
88	0-127	Warp Manual
89	0-127	MOD 2 > Level
90	0-127	ENV 3 > Level
93	0 disable | >0 enable	MIDI synth
101	>0	Flip Bypass state
102	>0	Flip Bypass state
103	0 EZ | 1 Presets | 2 Deep	Edit mode
118	>0	Capture current settings to Save
119	>0	Save Preset

MIDI IMPLEMENTATION continued

Sending MIDI PC messages 0-22 will load saved user presets. (User presets 11-22 can only be saved and accessed via MIDI)
Any PC message above 22 will load factory presets.

WARRANTY

Warranty: Subdecay Studios offers a 3 year limited warranty from the purchase date to the original purchaser. This warranty does not cover polar bear attacks, willful destroyment, using your pedal as a hammer, or the neglect of the user. It does not cover the finish, paint or any external superficial damage. Any unauthorized repairs or modifications voids the warranty.
This document was believed to be accurate at the time it was created. Specifications are subject to change without notice.