

# ENZ



## MANUAL v.2

MORE THAN LOGIC. UNITING ART + ENGINEERING.



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# SECTION 1 - FRONT PANEL CONTROLS

**Pitch:** Changes the pitch of the Synth or Dry signal in half step increments  
**Alt Function: Portamento**  
 Smoothly glide from one Synth note to another [Bends the pitch using the filter envelope as a modifier in Dry Mode]

**Sustain:** Increases the sustain of Synth notes [Compresses the input in Dry Mode]  
**Alt Function: Ring Modulation**  
 Changes the frequency of a classic ring modulator. The filter envelope as a modifier

**Hold to access Alt Functions:**  
 Alt Functions are only accessible when this button is held

**Tap:** Sets the time for the delay line and arpeggiated Synth  
**Alt Function: Envelope Type**  
 Changes the Filter Envelope from Triggered Envelope to Envelope Follower  
**Hold Tap:** Momentarily turns Delay Feedback to max

**Feedback:** Changes the cutoff frequency of the filter  
**Alt Function: Filter Type**  
 Select between 6 filter types [from Min to Max] :  
 1. Ladder Lowpass  
 2. Ladder Shelving Bandpass  
 3. Ladder Highpass  
 4. State Variable Lowpass  
 5. State Variable Bandpass  
 6. State Variable Highpass

**Mix:** Adjusts the balance between Dry and Wet signals  
**Alt Function: Delay Level** Sets the level of a single delay tap from Min to Mid. After the Midpoint, this control blends in a second stereo tap.

**Modulation:** Detunes the oscillators of each Synth voice [Sets the amount of delay modulation in Dry mode]  
**Alt Function: Delay Feedback**  
 Sets the repeats for the delay line

**[Press to Select Synth Mode]**  
**Poly:** Multi-Voice Synthesizer with polyphonic chord tracking  
**Mono:** Single Voice Dual Osc Synth w/monophonic tracking  
**Arp:** Turns your chords into sequenced patterns linked to the tap tempo  
**Dry:** Disables the Synth. Allows the filter, delay and pitch shift to be applied to the input signal

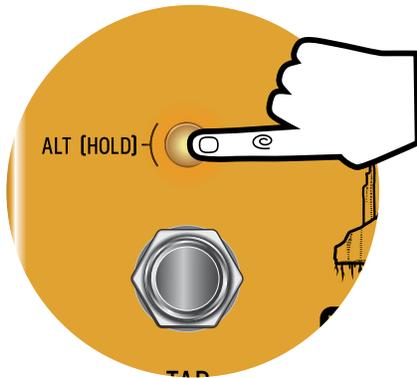


**Filter Envelope:** Sets attack and decay rates for the Triggered Envelope; sets the direction and sensitivity for the Envelope Follower  
**Alt Function: Filter Bandwidth [Resonance]** Changes the filter from a wide bandwidth for gentle filtering to a narrow bandwidth for peaky filtering

**Bypass:** Disables processing and passes the input through to the output  
**Alt Function: Synth Waveshape**  
 Changes the Synth waveshape from Sawtooth to Square

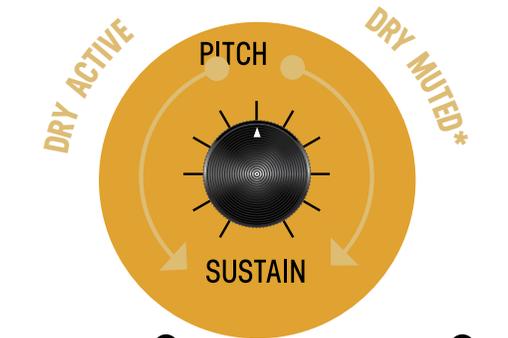
# SECTION 2 - GLOBAL SETTINGS CONFIGURATION MODE

## TO START GLOBAL SETTING CONFIGURATION MODE



HOLD **(L)** LED switch on power up (power up takes 3 secs); all of the front panels LEDs will blink 3 times

**KILL DRY:** \*With **DRY MUTED**, the pedal delivers wet only in active mode; in bypass, the entire pedal is muted.



**(L)** LED indicates DRY ACTIVE

**(R)** LED indicates DRY MUTED

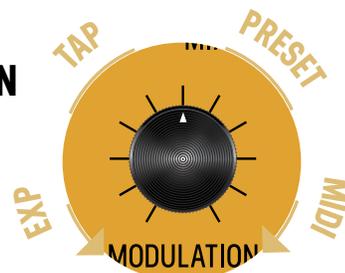
## INPUT MODE:



**(L)** LED indicates MONO

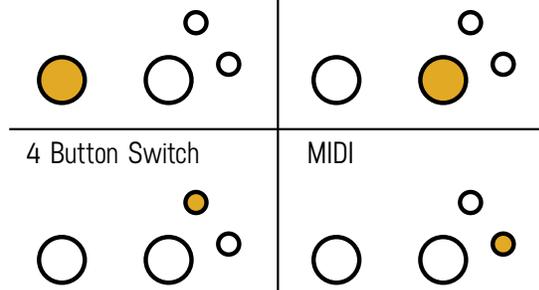
**(R)** LED indicates TRS

## EXPRESSION MODE:



Expression

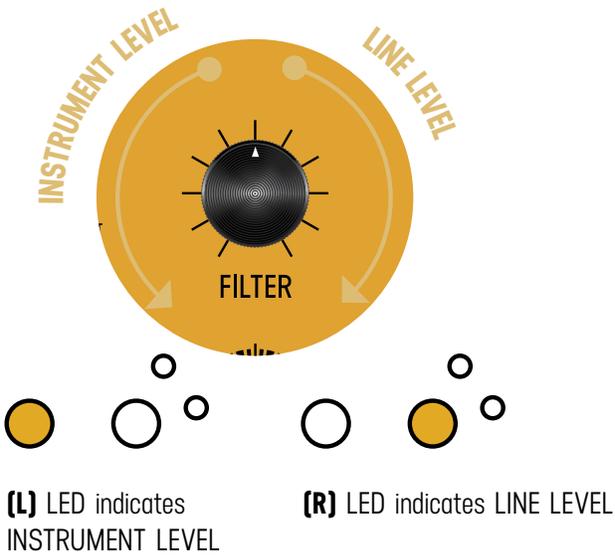
Tap



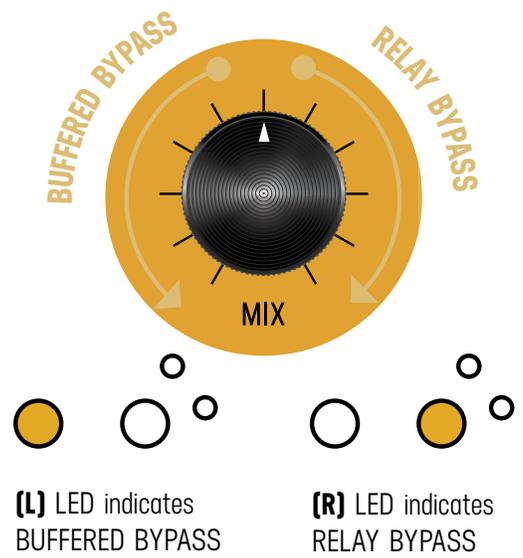
4 Button Switch

MIDI

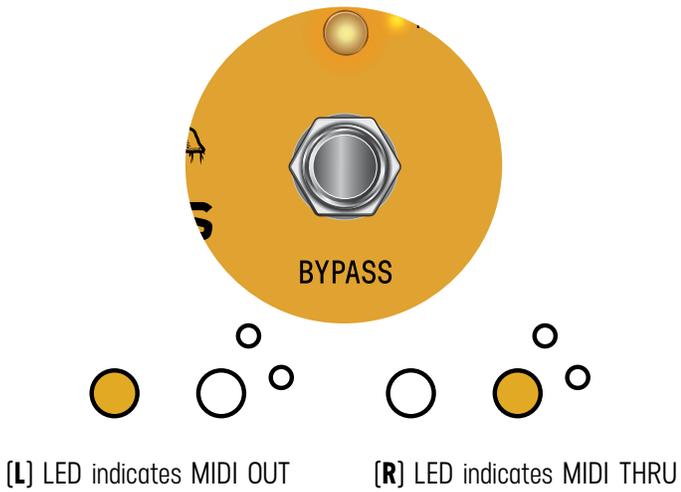
### LINE/SYNTH LEVEL:



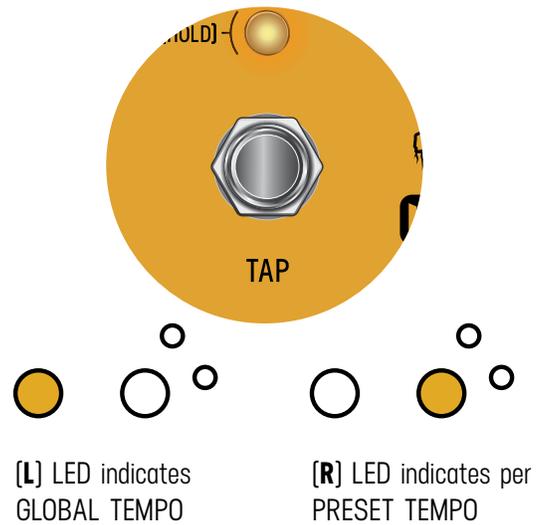
### BYPASS MODE:



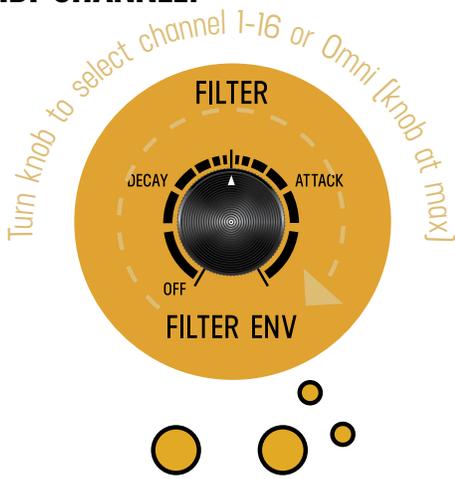
### MIDI THRU ON: Toggle [R] foot switch



### GLOBAL TEMPO: Toggle [L] foot switch

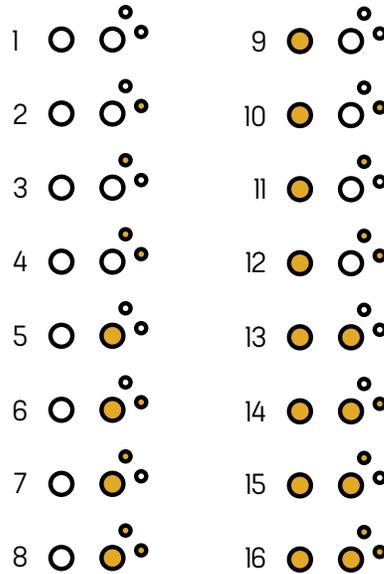


## MIDI CHANNEL:

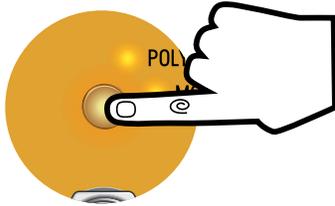


LEDs on front panel blink to indicate binary

## MIDI CHANNELS



## TRAILS:



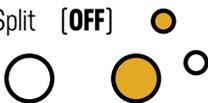
Trails [OFF]  
Split [OFF]



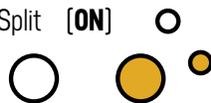
Trails [OFF]  
Split [ON]



Trails [ON]  
Split [OFF]



Trails [ON]  
Split [ON]



**<-- SYNTH MODE BUTTON:** This configuration control provides four different combinations of Trails and Split Output. With "Trails" enabled, your echoes will decay naturally when the pedal is bypassed. With "Split" enabled, the your dry signal is always on the right output, even with the effect enabled. This option basically adds a built in Y-Splitter to the Enzo. It can be used for sending the synth to a different amp than your guitar tone. It also can be used if you want synth to be a parallel path to the drive pedals on your pedalboard.

## SECTION 3 - DESIGN CONCEPT

The Enzo draws its inspiration from a wide cross section of synthesis techniques and elements used by Terry Riley, Joe Zawinul, Vangelis, and others synth pioneers to create an unparalleled instrument. Paired with Enzo's wide palette of synthesis tools are multiple pitch detectors to find the perfect match for your musical passage, whether it be chord work, leads, classic pitch bending, and a unique arpeggiator.

## SECTION 4 - SIGNAL FLOW OVERVIEW

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The Enzo starts with a selection of four choices of synth modes: Polyphonic, Monophonic, Arpeggiated and Dry. Next in the chain is the multi-mode filter with 6 different types spanning ladder and state variable options. The filter flows into our classic ring mod section with variable carrier frequency and the ability to link to the Filter Envelope as a modifier. Last in the chain is the two tap delay line with modulation and stereo out.

## SECTION 4A - SYNTHESIZER MODES

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The Enzo features 4 distinct Synth Modes:

1. Polyphonic [only the Poly LED on]:



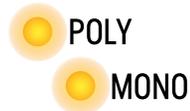
The Polyphonic mode detects every note in your chord and assigns a two oscillator synthesizer voice to each one. The Pitch, Portamento, Sustain, Waveform and Modulation controls work the same as the other Synth modes.

2. Monophonic [only the Mono LED on]:



Provides fast response and accurate pitch bends for intricate lead work. The Pitch knob control shifts the Synth pitch in semitones above or below the detected pitch, and the Portamento knob provides a smooth glide from one note to the next. The output of the Mono Synth tracks and matches the volume of your input note. For the most natural response, turn Sustain to minimum; to make the synthesized note last longer, turn up the Sustain control. Use the Modulation knob to fatten the sound by detuning the two oscillators in the voice. The Waveform switch provides the choice between Sawtooth and Square waveshapes.

3. Arpeggiated [both LEDs on]:



The Arpeggiated mode is designed to add a unique texture under your playing, rather than building a set sequence. The arpeggiator plays the notes back in order of loudness when they were first recognized. If you play a single note, the arpeggiator will play that root note and whatever harmonics it senses. If you play a full chord, it will play back the notes in order of loudness.

The Pitch, Portamento, Waveform and Modulation controls work the same as the Mono mode. For best results set the Sustain control to Max; this keeps the arpeggiated sequence going as you play through your chord changes.

4. Dry [both LEDs off]:



The Dry mode replaces the Synth with a classic pitch shifter featuring mono detection. The Pitch knob control shifts the pitch in semitones, and in this mode, the Portamento knob works as a switch to allow you to use the Filter Envelope as a modifier for automatic bending effects. Also unique to this mode, the Sustain knob controls a post filter compressor, and the Modulation knob modulates the delay line's time.

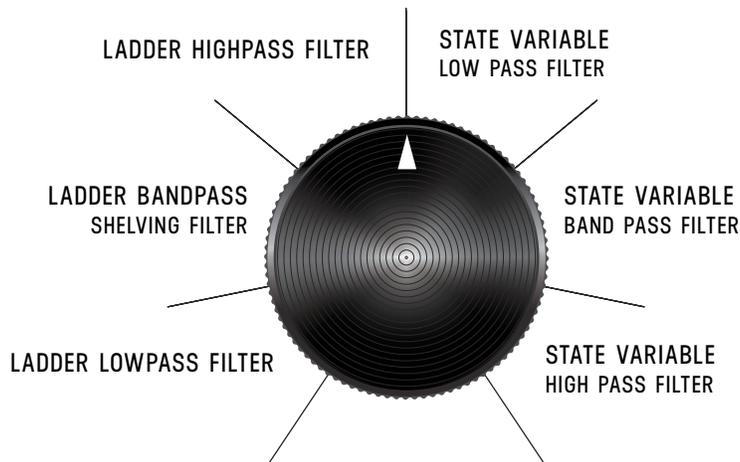
**Tip:** If you are using the Envelope to control the Pitch Bending in Dry Mode, the best way to have the filter do nothing is to select the "Ladder Highpass" filter type and turn the Filter knob to zero. This way the filter will stay put, even if the envelope is working.

## SECTION 4B - FILTER TYPES AND CONTROL

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The Enzo features 6 different filter types as listed in the knob graphic below. The Ladder Filter options are based on our own custom ladder style topology and feature a sharp cutoff. The State Variable Filter options are based on a beloved synthesizer expander filter and feature a more gentle rolloff past the cutoff frequency.

Outside of the Filter Type knob, there are four more controls that influence how the filter operates: The top level Filter knob sets the cutoff frequency of the filter. The Bandwidth knob sets the resonance or "Q" of the filter with minimum being the most gentle setting. The Filter Envelope changes how the filter reacts when a new pick attack is detected, providing everything from slow attacks to sharp stabs. And the Envelope Type changes the Filter Envelope from Triggered Envelope to Envelope Follower.



**Tip:** For the classic auto-wah sound on higher ground: set the Filter Type to State Variable Bandpass and set the Envelope Type to Envelope Follower.

## SECTION 4C - RING MODULATION

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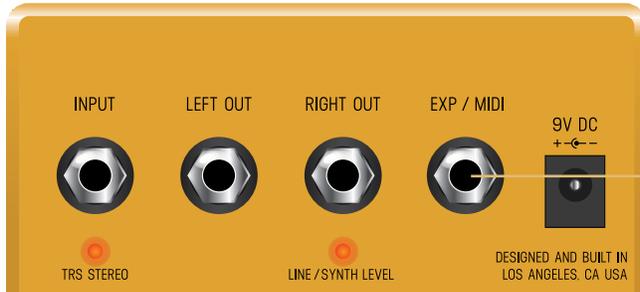
As legendary synth designer Marcus Ryle wisely pointed out, ring modulation is simultaneously one of the most useful and most misunderstood synth elements. Taking direct inspiration from the venerable CS-80, the Enzo's ring modulation provides carrier frequency adjustment via the "Ring Mod" Alt knob. This knob provides a vast range of frequencies from the audio range down to tremolo speeds. The minimum position of the knob bypasses the ring modulation. When active, the Filter Envelope can be used as a modifier for the carrier frequency; this provides dramatic sweeping effects for each new note.

## SECTION 4D - DELAY

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The Enzo features a delay with independent Tempo, Level, and Feedback. The alt mode Delay Level knob has a special taper. From minimum to the midpoint, Delay Level controls the volume of a single delay tap. From the midpoint to maximum, the Delay Level blends in a second delay tap. When the Delay Level control is at full maximum you have a stereo ping pong delay on the left and right outputs. Another special feature of the delay is enabled when the Synth Mode is set to Dry. Here the Modulation knob adds modulation speed and depth to the repeats of the delay.

## SECTION 5 - EXPRESSION JACK MODES IN DEPTH



The Expression Pedal Jack is a multifunction jack that gives you 4 different modes of operation that you can choose in Global Settings Mode: Expression Pedal, Tap Switch, 4 Button Preset Switch, and MIDI.

### Section 5a. Expression Pedal

The expression pedal works by morphing between two complete settings of all of the knob values [even the second layer knob values]. This gives you two complete and distinct presets in one that you can then use the expression pedal to morph between. Put the expression pedal to the "toe up position" and set the knobs [including the 2nd layer ones] any way you wish, and then put the expression pedal to the "toe down position" and set the knobs to create your second sound. Now sweeping the expression pedal from heel to toe will smoothly morph between those two sets of settings. You can also manipulate the expression pedal using MIDI CC #04.



When using the expression pedal, if you ever want to quickly copy the "toe up" to the "toe down" settings of the expression pedal, just unplug the cable from the Enzo at the EXP jack and then plug it back in. It's a really useful shortcut so you don't have to manually recreate your sound if all you want the expression pedal to change is just one parameter.

### Section 5b. Tap Switch

For the Enzo, the external switch controls Tap Tempo and has all of the same functionality as the tap button on the main pedal, this includes max feedback. As with the main tap switch, if you hold the externally connected tap switch it will cause the delay max feedback.

### Section 5c. 4 Button Preset Switch

This mode gives you access to and instant enabling of presets 1 through 4, when connected with a proprietary Meris 4 button switch.

### Section 5d. MIDI

The Enzo features both MIDI In and Out via the EXP jack, and has a rich and deep MIDI implementation. All the knobs, alt functions, expression pedal, and switches are available via MIDI CCs. You can receive program change messages (MIDI PCs), sync to MIDI Beat Clock[Enzo], you also have the ability to send and receive presets. Be sure to set the your desired MIDI channel in Global Settings Configuration Mode. If you have multiple devices connected to MIDI in a chain, you will probably want each to device to set to listen to and send on its own channel. Also, be sure to check out MIDI CC table later in this manual.



## SECTION 6 - KNOB AUTO SCAN IN DEPTH

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Depending on the EXP Jack modes you have chosen, the Enzo will scan the top layer knobs and update the knobs on power up. If your Enzo is set to either "Expression Pedal" or "Tap Switch" for its EXP mode, then it will scan the knobs at power up. This means if you change the knobs whether the unit is off, those values will be how the pedal sounds next time you turn the pedal is on. Additionally, the Tempo and the Synth Types are auto saved and return to whatever they were set to last when powering up the pedal. These behaviors are meant to mimic the behavior of how all classic guitar pedals work. If your Enzo is set to either "4 Button Preset Switch" or "MIDI" for its EXP jack mode, then the pedal will simply recall the preset that is stored in the current memory location. This setting makes sure that the Enzo functions like a standard multi-preset device, for those who depend on recalling exact sounds for a performance.

## SECTION 7 - PRESETS IN DEPTH

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The Enzo features 16 internal preset locations. The first four presets are accessible by a compatible 4 button footswitch and all sixteen presets are accessible by MIDI Program Change messages.

To save a preset simply hold the Alt button. The preset is saved every time you edit the "Alt"/2nd layer knobs, this is how the Enzo is able to keep your synth settings in its memory after a power down.

To save a preset to a different location than your current location, either press the desired preset button on a compatible 4 button footswitch or send a Program Change message over MIDI to which ever preset you would like to edit. After you are done with any changes, just press and hold the "Alt" button to save.

The Enzo can send and receive full presets for via MIDI Sysex Data. To send a preset from the Enzo to your computer by pressing the Bypass LED switch while holding the Alt button. The Enzo is always listening for preset data, so simply send any presets you have backed up on your PC back to the Enzo and it will overwrite that preset with the data you sent. If you are happy with the newly received preset, simply press Alt and the Enzo will save that data to the current preset location.

## SECTION 8 - TEMPO IN DEPTH

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In the Enzo you can set the tempo using one of the following tapping in quarter notes using the integrated Tap switch, External Tap switch, MIDI Beat Clock, Tempo MIDI CC, or Tap Switch MIDI CC.

## SECTION 9 - FACTORY RESET

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Holding down the "Synth Mode" button on power up resets all of the presets and all of the global settings back to their original factory values. Once the reset is complete, simply recycle the power on the unit.

## SECTION 10 - MIDI CC TABLE

| CONTROL CHANGE | ENZO CONTROL              | RECEIVE VALUE RANGE  | TRANSMIT VALUE RANGE   |
|----------------|---------------------------|--|--|
| CC# 04         | EXPRESSION PEDAL          | 0 TO 127   | 0 TO 127   |
| CC# 09         | ENVELOPE TYPE             | 0 TO 63 = TRIGGERED ENV<br>64 TO 127 = ENV FOLLOWER                                  | 0 TO 63 = TRIGGERED ENV<br>64 = ENV FOLLOWER                     |
| CC# 14         | BYPASS                    | 0 TO 63 = FX BYPASS<br>64 TO 127 = FX ENABLE   | 0 FOR FX BYPASS<br>127 FOR FX ENABLE                             |
| CC# 15         | TEMPO [10 MSEC INTERVALS] | 0 TO 120   | 0 TO 120   |
| CC# 16         | PITCH                     | 0 TO 127   | 0 TO 127   |
| CC# 17         | FILTER                    | 0 TO 127   | 0 TO 127   |
| CC# 18         | MIX                       | 0 TO 127   | 0 TO 127   |
| CC# 19         | SUSTAIN                   | 0 TO 127   | 0 TO 127   |
| CC# 20         | FILTER ENVELOPE           | 0 TO 127   | 0 TO 127   |
| CC# 21         | MODULATION                | 0 TO 127   | 0 TO 127   |
| CC# 22         | PORTAMENTO                | 0 TO 127   | 0 TO 127   |
| CC# 23         | FILTER TYPE               | 0 TO 127   | 0 TO 127   |
| CC# 24         | DELAY LEVEL               | 0 TO 127   | 0 TO 127   |
| CC# 25         | RING MODULATION           | 0 TO 127   | 0 TO 127   |
| CC# 26         | FILTER BANDWIDTH          | 0 TO 127   | 0 TO 127   |
| CC# 27         | DELAY FEEDBACK            | 0 TO 127   | 0 TO 127   |
| CC# 28         | TAP                       | 127 = TAP PRESS  | 127 = TAP PRESS  |
| CC# 29         | SYNTH MODE                | 0 - 31 = DRY<br>32 - 63 = MONO SYNTH<br>64 - 95 = ARP SYNTH<br>96 - 127 = POLY SYNTH | 0 = DRY<br>63 = MONO SYNTH<br>95 = ARP SYNTH<br>127 = POLY SYNTH |
| CC# 30         | SYNTH WAVESHAPE           | 0 - 63 = SAWTOOTH<br>64 - 127 = MONO SYNTH   | 0 = SAWTOOTH<br>127 = SQUARE                                     |

## SECTION 12 - TECHNICAL SPECIFICATIONS

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|                    |   |
|--------------------|---|
| Conversion         | 24 bit A/D and D/A  |
| DSP                | 32 bit floating point   |
| Sample Rate        | 48000 Hz  |
| Input Impedance    | 1 Meg Ohm   |
| SNR                | 115dB   |
| Frequency Response | 20Hz-20kHz  |
| Max Input Level    | +9 dBu [instrument level setting]<br>+12.5 dBu [line/synth level setting] |
| Power              | 9V DC center-negative, 150mA, 2.1mm jack                                  |
| Bypass             | Selectable True Bypass [Relay] or Analog Buffered Bypass                  |
| Dimensions         | 4.25" wide, 4.5" long, 2" tall  |
| Weight             | 14.6 ounces   |



### Federal Communications Commission Radio Frequency Interference Statement

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired operation.

This equipment requires shielded interface cables in order to meet FCC class B limit.

Any unauthorized changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.