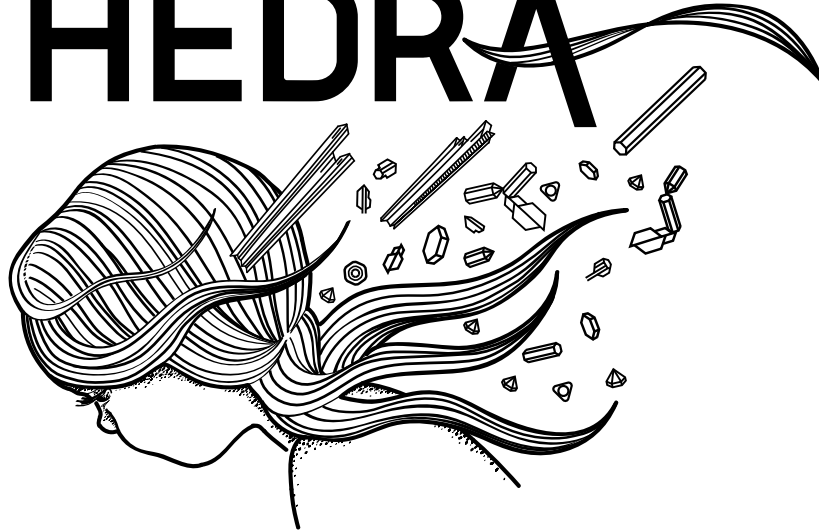


HEDRA



MANUAL v.6

MORE THAN LOGIC. UNITING ART + ENGINEERING.



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TABLE OF CONTENTS

SECTION 1	PG. 1	FRONT PANEL CONTROLS
SECTION 2	PG. 2-4	GLOBAL SETTINGS CONFIGURATION MODE
SECTION 3	PG. 5-7	SIGNAL FLOW OVERVIEW
		3a - DELAY LINE MODES
		3b - FILTER TYPES AND CONTROL
		3c - RING MODULATION
		3d - DELAY LINE
SECTION 4	PG. 8-10	EXPRESSION JACK MODES IN DEPTH
		4a - EXPRESSION PEDAL
		4b - TAP SWITCH
		4c - 4 BUTTON PRESET SWITCH
		4d - MIDI
SECTION 5	PG. 11	TRIGGERING PITCH VALUES WITH A MIDI KEYBOARD
SECTION 6	PG. 11	TEMPO IN DEPTH
SECTION 7	PG. 11	KNOB AUTO SCAN IN DEPTH
SECTION 8	PG. 11	PRESETS IN DEPTH
SECTION 9	PG. 12	MIDI CC TABLES
SECTION 10	PG. 13	FACTORY RESET
SECTION 11	PG. 13	TECHNICAL SPECIFICATIONS

SECTION 1 - FRONT PANEL CONTROLS

Key: Selects key for diatonic harmonies. Set to max for chromatic shifting

Alt Function: Scale Type Select

[from Min to Max]: Major, Minor, Melodic Minor, Harmonic Minor, Double Harmonic, Lydian Pentatonic, Minor Pentatonic

Pitch 1: Sets interval for the first pitch shifted voice

Alt Function: Time Division 1

Sets a fraction of the main tempo for the first pitch shifted voice

Hold to access Alt Functions:

Alt Functions are accessible when this button is held

Tap: Sets the main tempo/delay time. Total available time for the two Series delay modes = 520 msec. For the Two Dual delay modes = 260 msec

Alt Function: Half Speed Enables the delay to run at half speed

Hold Tap: Momentarily enable an automatic volume swell based on your pick attack

Micro Tune: Slightly detunes all three pitch shifted voices

Alt Function: Pitch Correction and Glide

When the knob is between Min and Mid select between: No Correction, Loose Correction, Strict Correction. When knob is between Mid and Max selects amount of glide

Mix: Adjusts the balance between Dry and Wet signals

Alt Function: Delay Feedback Controls delay feedback.

Series delay modes: Pitch 3 sets the feedback loop.

Dual delay modes: Pitch 1 and 3 both add to the feedback loop

Pitch 3: Sets interval for the third pitch shifted voice

Alt Function: Time Division 3 Sets a fraction of the main tempo for third pitch shifted voice

[Press to Select Mode]

Dual: Splits the delay into 2 short delays with a stereo output

Dual + Series: the same 2 short delays as Dual mode, now with cross-feedback

Series: One long series delay with standard feedback

Pitch Feedback: One long series delay with the pitch shifters in the feedback loop

Bypass: Disables processing and passes the input thru to the output

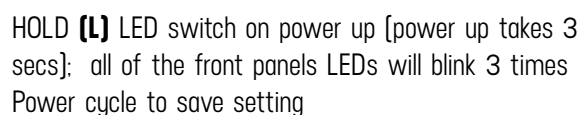
Alt Function: Pitch Control Smoothing Enables smoothing of the Pitch knobs. Turn the smoothing off to hard step through the intervals.



Pitch 2 : Sets interval for the second pitch shifted voice

Alt Function: Time Division 2 Sets a fraction of the main tempo for second pitch shifted voice

TO START GLOBAL SETTING CONFIGURATION MODE

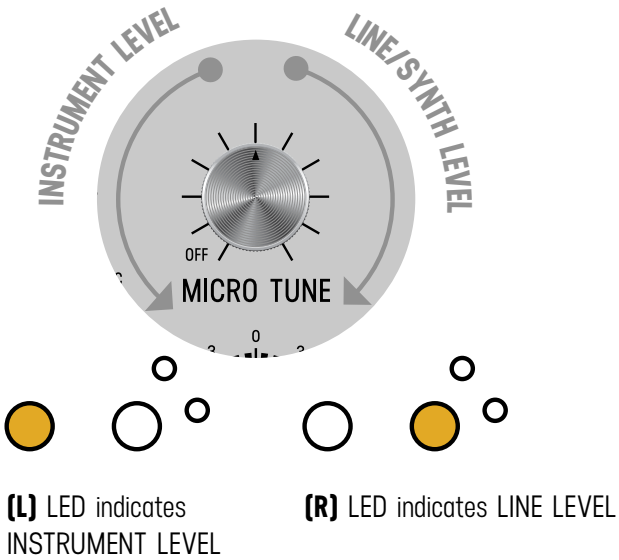


(R) LED indicates
DRY MUTED

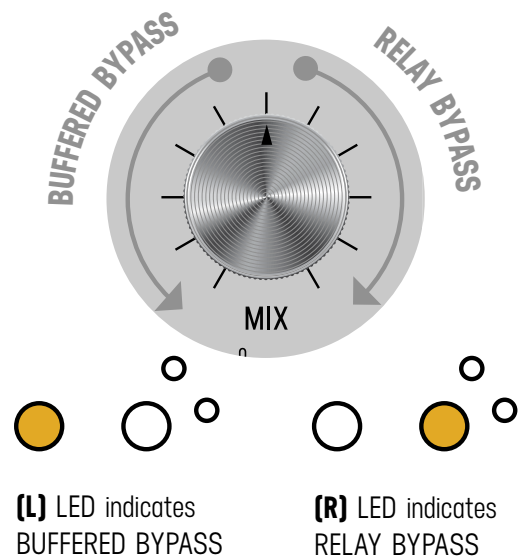
(R) LED indicates TRS



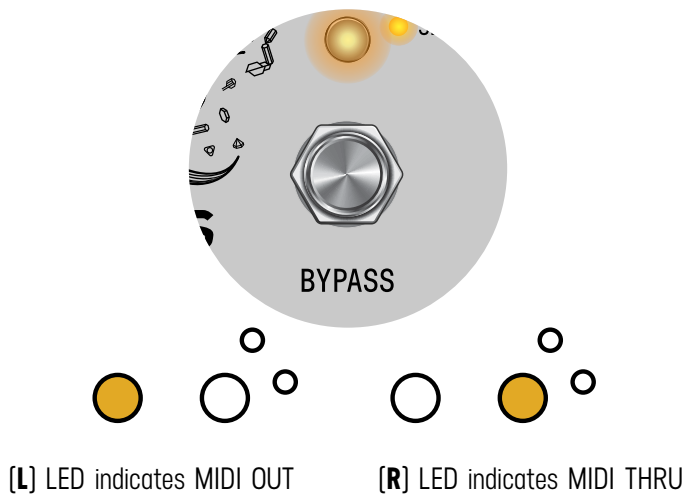
LINE/SYNTH LEVEL:



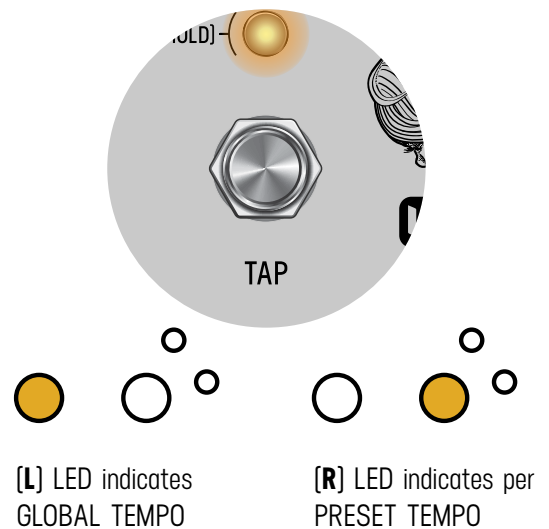
BYPASS MODE:



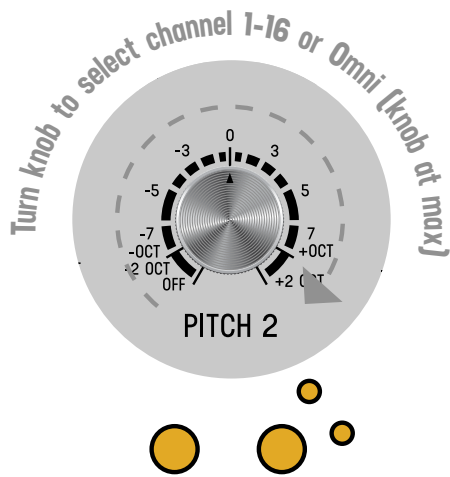
MIDI THRU ON: Toggle [R] foot switch



GLOBAL TEMPO: Toggle [L] foot switch

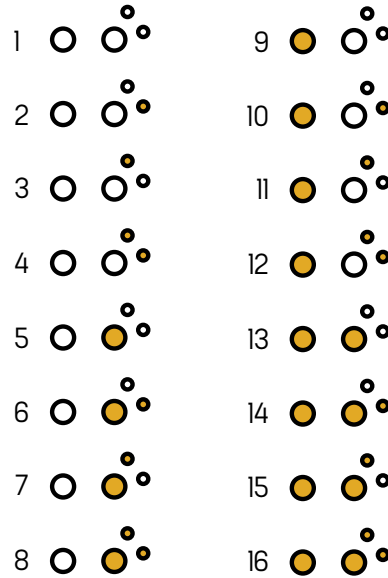


MIDI CHANNEL:

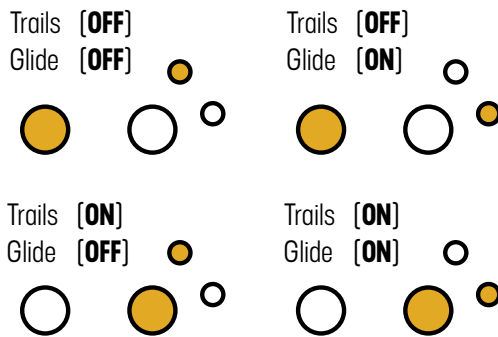
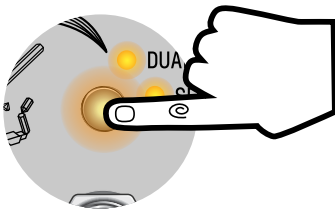


LEDs on front panel blink to indicate binary

MIDI CHANNELS



TRAILS & GLIDE:



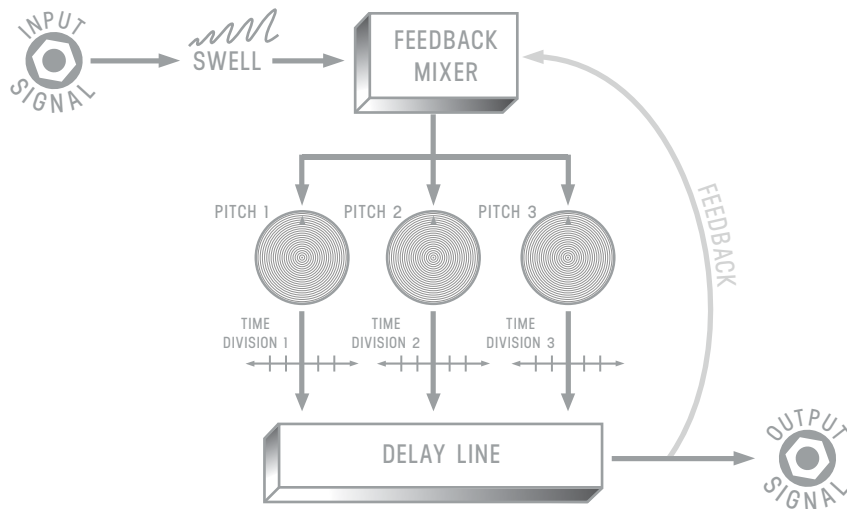
<-- Note: This configuration control provides four different combinations of Trails and Glide. With Trails enabled, your echoes will decay naturally when the pedal is bypassed. With Glide enabled, your delay buffer is not cleared during a preset change. Glide allows your echoes to remain in the algorithm as you smoothly transition from one preset to the next. Additionally, with Glide enabled, delay times entered with tap tempo will smoothly transition.

SECTION 3A - SIGNAL FLOW OVERVIEW

The Hedra features 4 distinct Delay Line Modes:

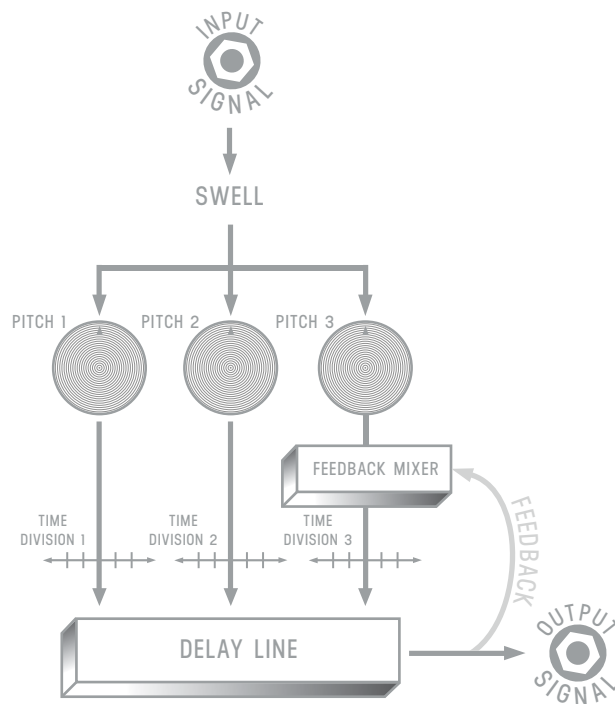
1. Series Delay + Pitch Feedback [both LEDs off]:

In this mode, Hedra is configured to have one delay line [520 msec] with three inputs and one output. In this mode, the repeats are recycled through the pitch shifters

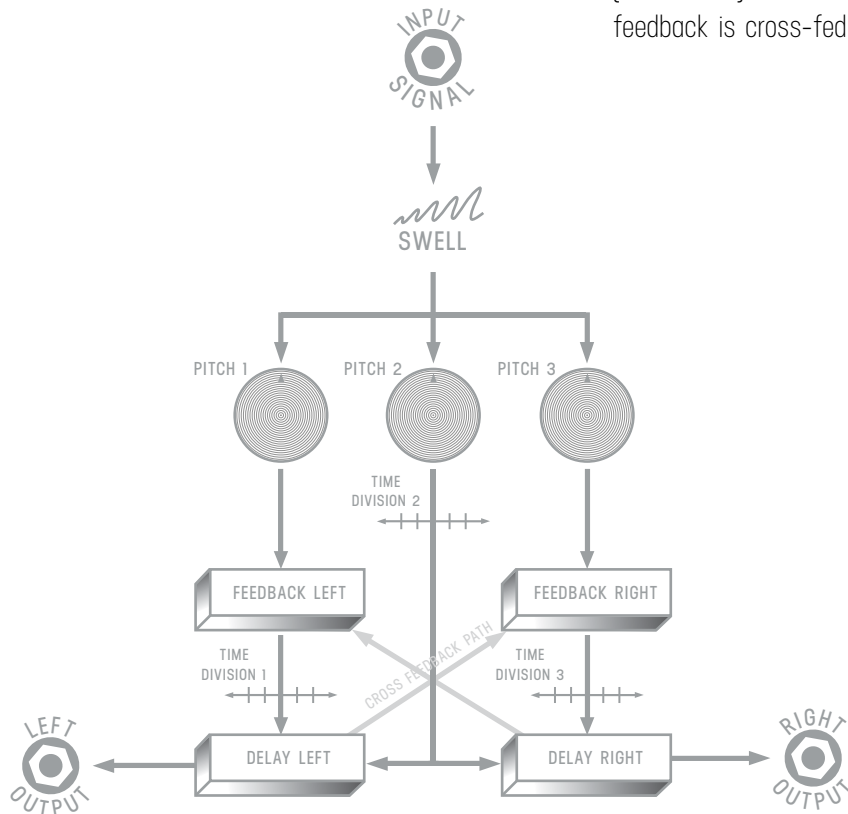


2. Series Delay [only the Series LED on]:

In this mode, Hedra is configured to have one delay line [520 msec] with three inputs and one output. In this mode, the repeats are mixed in after the pitch shifting.

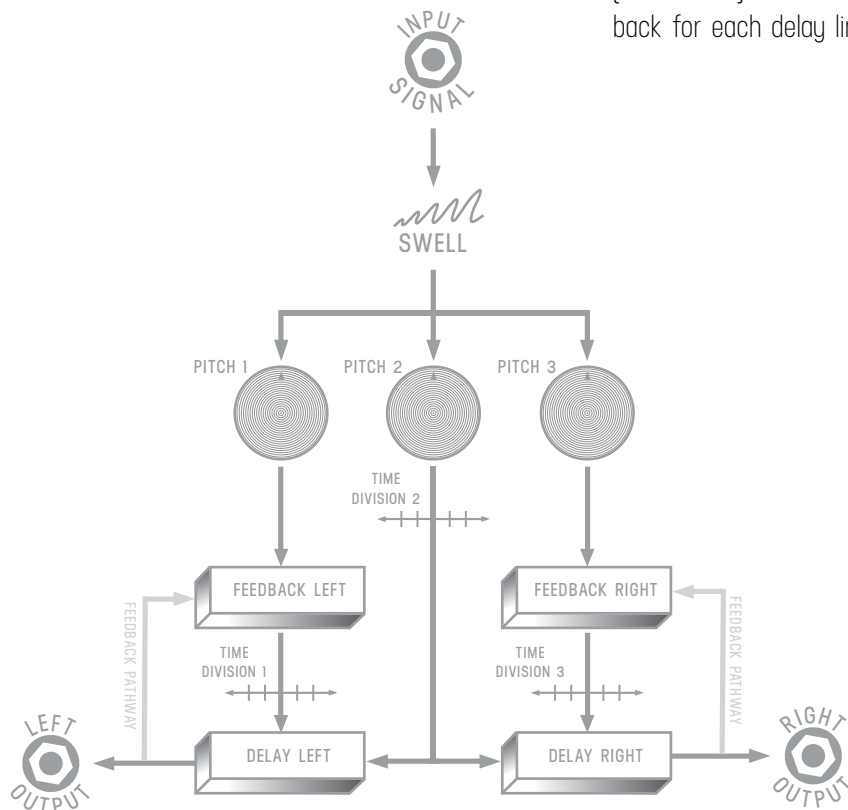


3. Dual with Cross-feedback (both LEDs on): In this mode, Hedra's memory is split into two equal stereo delay lines [260 msec]. Each delay line has two inputs and one output. Here, the feedback is cross-fed between the left and right channels.



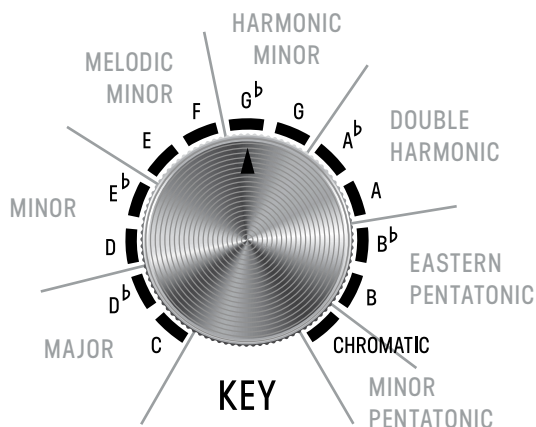
4. Dual Delay (only the Dual LED on):

In this mode, Hedra's memory is split into two equal stereo delay lines [260 msec]. Each delay line has two inputs and one output. The feedback for each delay line is independent.



SECTION 3B - KEYS AND SCALES

Along with the front panel Key selection available on Hedra, hold the alt button and turn the Key knob to modulate through and select among the following scales:



Major: Semi-tones: 2 - 2 - 1 - 2 - 2 - 2 - 1
Intervals: Root, Major 2nd, Major 3rd, Perfect 4th, Perfect 5th, Major 6th, Major 7th, Octave

Minor: Semi-tones: 2 - 1 - 2 - 2 - 1 - 2 - 2
Intervals: Root, Major 2nd, Minor 3rd, Perfect 4th, Perfect 5th, Minor 6th, Minor 7th, Octave

Melodic Minor: Semi-tones: 2 - 1 - 2 - 2 - 2 - 2 - 1
Intervals: Root, Major 2nd, Minor 3rd, Perfect 4th, Perfect 5th, Major 6th, Major 7th, Octave
Notes: When you ascend the melodic minor scale you use the above intervals, but depending on the composition, when you descend you might want to use the intervals of the minor scale. Use an expression pedal with Hedra to choose how the scale reacts to your playing.

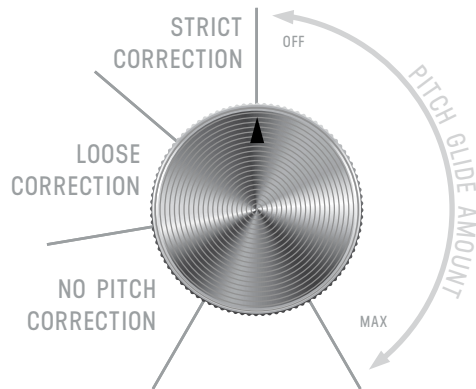
Harmonic Minor: Semi-tones: 2 - 1 - 2 - 2 - 1 - 3 - 1
Intervals: Root, Major 2nd, Minor 3rd, Perfect 4th, Perfect 5th, Minor 6th, Major 7th, Octave

Double Harmonic: Semi-tones: 1 - 3 - 1 - 2 - 1 - 3 - 1
Intervals: Root, Minor 2nd, Major 3rd, Perfect 4th, Perfect 5th, Minor 6th, Major 7th, Octave

Lydian Pentatonic: Semi-tones: 4 - 2 - 1 - 4 - 1
Intervals: Root, Major 3rd, Tritone, Perfect 5th, Major 7th, Octave
Notes: This scale was inspired by the incredible music and playing of Marty Friedman and Jason Becker. One of the modes of the Hirajoshi scale, Raga Amritavarshini, Malashri, Shilangi, and Batti Lydian.

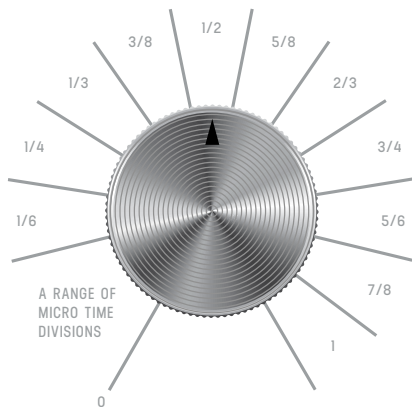
Minor Pentatonic: Semi-tones: 3 - 2 - 2 - 3 - 2
Intervals: Root, Minor 3rd, Perfect 4th, Perfect 5th, Minor 7th, Octave

SECTION 3C - PITCH CORRECTION AND GLIDE CONTROL



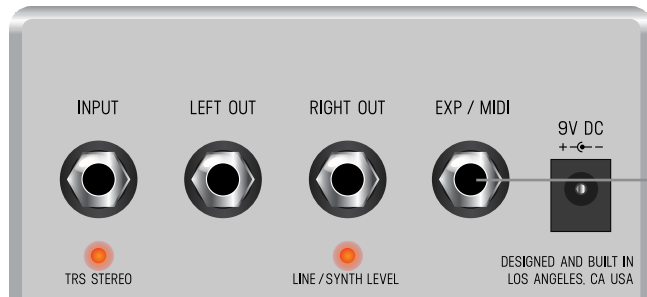
Hedra features 3 different pitch corrections settings or a pitch glide amount as listed in the knob graphic below. When Loose Correction is selected, the notes are forced into the current Key and Scale but pitch bending is not removed from the input. When Strict Correction is selected, the notes are forced into the current Key and Scale but pitch bending is removed from the input.

SECTION 3D - TIME DIVISION CONTROLS



The Alt control under each Pitch knob is a corresponding Time Division. The Time Division Knobs sets the delay of each pitch shifted voice by a fraction of the overall delay time set by the Tap Tempo switch. Ex: a dotted eighth note is $\frac{3}{4}$ of a beat.

SECTION 4 - 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 4a. 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 seconds 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 Hedra 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 4b. Tap Switch

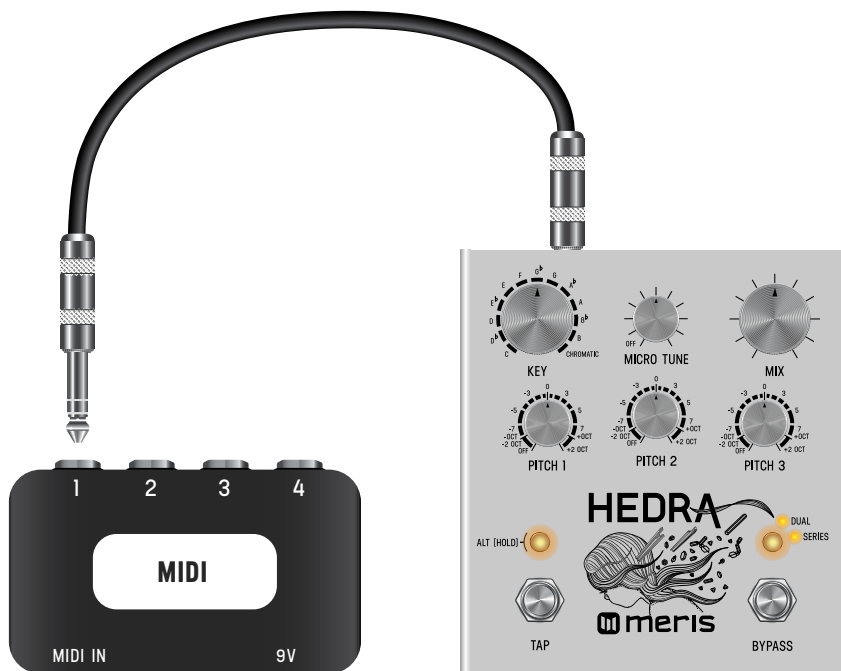
For the Hedra, the external switch controls Tap Tempo and has all of the same functionality as the tap button on the main pedal, this includes swell. As with the main tap switch, if you hold the externally connected tap switch it will enable the volume swell.

Section 4c. 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 4d. MIDI

The Hedra 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[Hedra], 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 5 - TRIGGERING PITCH VALUES WITH A MIDI KEYBOARD

Using our MIDI I/O, Hedra accepts MIDI Note On and Off messages to hard tune the pitch shift voices to the exact notes you play. Sending a single Note On Message into the Hedra will just tune the Pitch 1 value, sending two Note On Messages will tune Pitch 1 and Pitch 2, and [as expected] sending three Note On Messages will tune all three pitch values. When Note Off messages are received, the corresponding pitch value will mute. Here are a couple of creative possibilities that open up when connecting a keyboard: turn Time Divisions to zero and the MIX Knob to max and the keyboard will turn your input audio into a whole new playable instrument, use a DAW or MIDI Sequencer to play a 3 part song along with your dry signal, or turn the delay and feedback to max and use a MIDI note triggering foot controller to build sonic sculptures one note at a time.

SECTION 6 - TEMPO IN DEPTH

In the Hedra 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. Depending on the Delay Mode, different maximum delay times are available. In the two Series Delay Modes, 520 milliseconds is available. In the two Dual Delay Modes, 260 millisecond is available. Whenever a tempo / delay time is entered that exceeds the maximum time, Hedra will subdivide the tempo to fit the available time. For example, if you enter in a delay time of 1 second with Hedra's tap tempo button, then Hedra will divide the tempo in half [500 milliseconds] to fit.

SECTION 7 - KNOB AUTO SCAN IN DEPTH

Depending on the EXP Jack modes you have chosen, the Hedra will scan the top layer knobs and update the knobs on power up. If your Hedra 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 Delay Mode 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 Hedra 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 Hedra functions like a standard multi-preset device, for those who depend on recalling exact sounds for a performance.

SECTION 8 - PRESET IN DEPTH

The Hedra 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 Hedra is able to keep your sequencer step 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 Hedra can send and receive full presets for via MIDI Sysex Data. To send a preset from the Hedra to your computer by pressing the Bypass LED switch while holding the Alt button. The Hedra is always listening for preset data, so simply send any presets you have backed up on your PC back to the Hedra 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 Hedra will save that data to the current preset location.

SECTION 9 - MIDI CC TABLE

CONTROL CHANGE	HEDRA CONTROL	RECEIVE VALUE RANGE	TRANSMIT VALUE RANGE
CC# 04	EXPRESSION PEDAL	0 TO 127	0 TO 127
CC# 09	HALF SPEED ENABLE	0 TO 63 = NORMAL SPEED 64 TO 127 = HALF SPEED	0 TO 63 = NORMAL SPEED 64 = HALF SPEED
CC# 14	BYPASS	0 TO 63 = FX BYPASS 64 TO 127 = FX ENABLE	0 FOR FX BYPASS 127 FOR FX ENABLE
CC# 15	TEMPO [10 MSEC INTERVALS]	0 TO 127	0 TO 127
CC# 16	KEY	0 TO 127	0 TO 127
CC# 17	MICRO TUNE	0 TO 127	0 TO 127
CC# 18	MIX	0 TO 127	0 TO 127
CC# 19	PITCH 1	0 TO 127	0 TO 127
CC# 20	PITCH 2	0 TO 127	0 TO 127
CC# 21	PITCH 3	0 TO 127	0 TO 127
CC# 22	SCALE TYPE	0 TO 127	0 TO 127
CC# 23	PITCH CORRECTION + GLIDE	0 TO 127	0 TO 127
CC# 24	FEEDBACK	0 TO 127	0 TO 127
CC# 25	TIME DIVISION 1	0 TO 127	0 TO 127
CC# 26	TIME DIVISION 2	0 TO 127	0 TO 127
CC# 27	TIME DIVISION 3	0 TO 127	0 TO 127
CC# 28	TAP	127 = TAP PRESS	127 = TAP PRESS
CC# 29	DELAY MODE	0 - 31 = SERIES + PITCH FDBK 32 - 63 = SERIES 64 - 95 = DUAL + CROSS FDBK 96 - 127 = DUAL	0 = SERIES + PITCH FDBK 63 = SERIES 95 = DUAL + CROSS FDBK 127 = DUAL
CC# 30	PITCH CONTROL SMOOTHING	0 - 63 = SMOOTHING OFF 64 - 127 = SMOOTHING ON	0 = SMOOTHING OFF 127 = SMOOTHING ON
CC# 31	VOLUME SWELL ENABLE	0 - 63 = SWELL OFF 64 - 127 = SWELL ON	0 = SWELL OFF 127 = SWELL ON

SECTION 10 - FACTORY RESET

Holding down the "Delay 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 11 - TECHNICAL SPECIFICATIONS

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] +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.