futuresonus

parva

User's Guide

Preliminary v0.4

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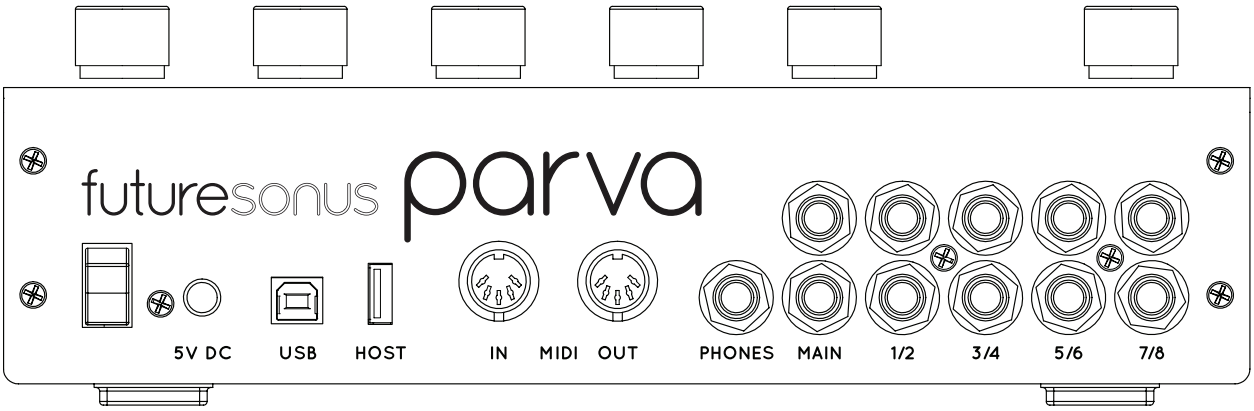
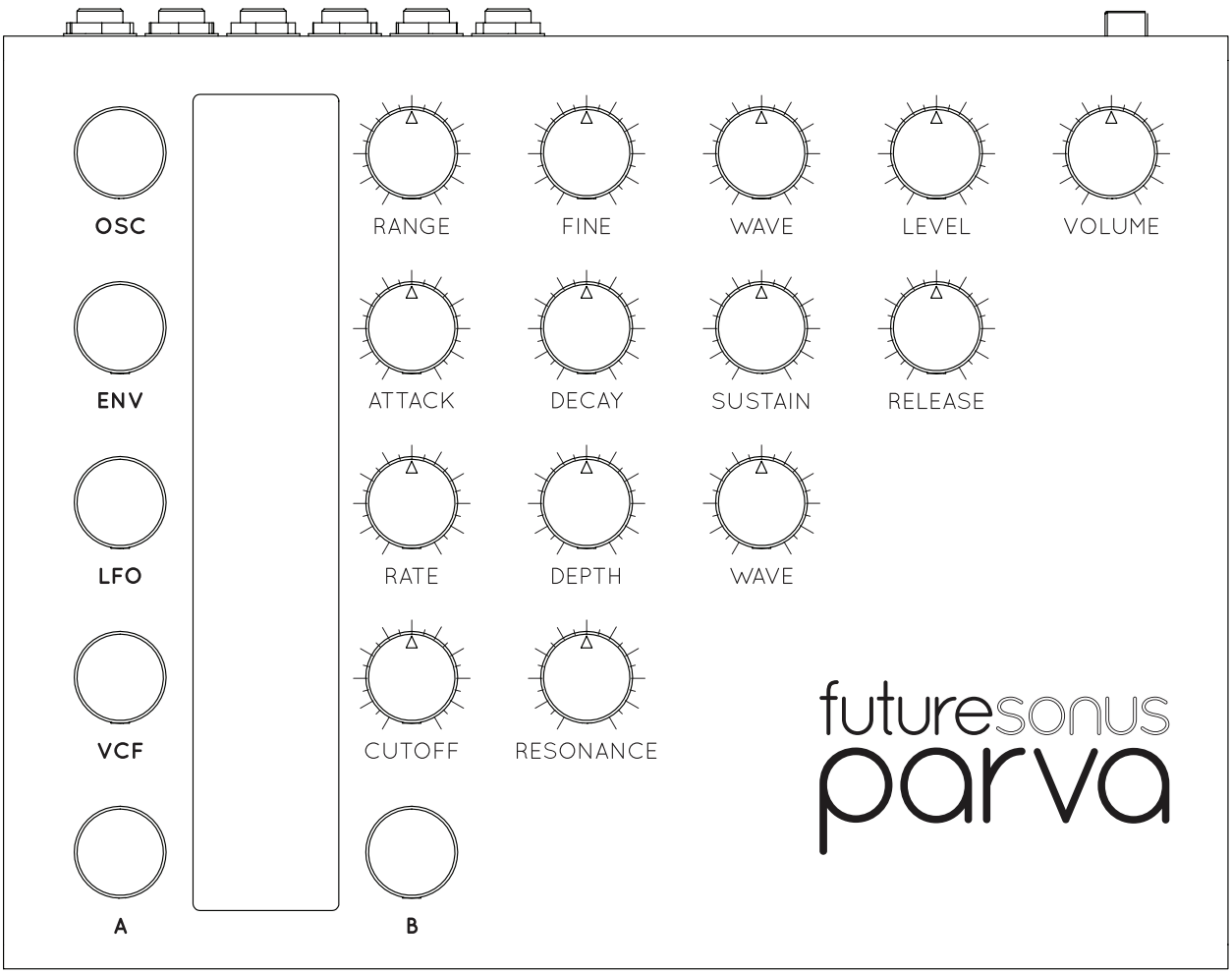
Connections



1. Power switch
2. Power input
3. USB port
4. USB host port
5. MIDI in
6. MIDI out
7. Headphone output
8. Main left & right outputs
9. Individual voice outputs

Controls



Parva uses a consistent approach to selecting and editing information. There are three basic movements - turning, clicking (briefly pressing and releasing), and holding (pressing and holding until the display changes) a knob. Take a few moments to become familiar with the menus and controls.

The black knobs offer direct access to the most commonly used parameters. No matter what else is currently being displayed, turning a black knob with show the parameter and it's value as it changes. The only exception is the Master Volume knob in the upper right corner. No value is displayed when that knob is adjusted.

The silver OSC, ENV, LFO, VCF, A, and B knobs are clickable rotary encoders used to navigate their respective menus.

Turn the knob to scroll through the available menu options or adjust a value. Click the knob to toggle the currently selected option. Press and hold to return to the previous menu. Try this brief example:

- Turn the OSC knob and watch the display change from OSC1 to OSC2, OSC3, OSC*, and back to OSC1. All Parva menus wrap around so you can scroll in either direction.
- Stop turning when you are back to OSC1.
- Click the OSC knob. Note the first parameter is selected.
- Turn the OSC knob and see how the parameters scroll. If a menu has more than four parameters, they will come into view as you scroll up or down.
- Click the OSC knob again. The name of the selected parameter and it's current value is displayed.
- Turn the OSC knob to adjust the value.
- When you have finished, click the OSC knob. The display now shows the updated value.
- Press and hold the OSC knob to return to the higher level menu. Note the parameter is no longer selected.
- Turn the OSC knob to verify you can scroll through the OSC1, OSC2, etc displays.

Note: In recent firmware versions, knob behavior is set to "catch." Turning the knob will have no effect until it's been turned through the current parameter value.

Oscillators

Parva has three digitally-controlled analog oscillators (DCOs) per voice. To select the oscillator you would like to edit, turn the OSC knob. The selected oscillator's current settings will be displayed, and the Range, Fine, Wave, and Level knobs can be used to directly adjust their respective parameters.

Click the OSC knob to access additional settings. Turn the OSC knob to scroll through the available options. Click it again to edit the highlighted parameter. Press and hold the OSC knob to return to the previous menu.

Oscillator Parameters		
Range	-60 .. +60	Increase or decrease the oscillator's pitch in semi-tone steps
Fine	-50 .. +50	Increase or decrease the oscillator's pitch in cent steps
Wave	Sawtooth, Triangle, PWM 0 .. 50	Select the oscillator waveform. P25 = Square Wave
Level	0 .. 127	Adjust the oscillator's relative volume level
Glide	0 .. 127	Set the oscillator's individual glide (portamento) time
Sync	Off/On	Synchronize the oscillator's waveform with OSC1

The global oscillator menu (OSC*) contains parameters that affect all three of the DCOs.

Global Oscillator Parameters		
Range	-60 .. +60	Increase or decrease oscillator pitch in semi-tone steps
Glide	0 .. 127	Set the overall glide (portamento) time
Slop	0 .. 15	Slightly detune the oscillators for a thicker sound
Noise	0 .. 127	Adjust the volume level of the white noise source

Envelopes

There are four envelopes per voice, each of which can be routed to one or more modulation destinations. The first two envelopes' destination settings are fixed: ENV1 is routed to the VCA, controlling the amplitude of each note, and ENV2 is routed to the filter cutoff. However, both of these can also be used to modulate any other parameter through the Modulation Matrix.

To select the envelope you would like to edit, turn the ENV knob. The selected envelope's current settings will be displayed, and the Attack, Decay, Sustain, and Release knobs can be used to directly adjust their respective parameters.

Press the ENV knob to access additional settings. Turn the ENV knob to scroll through the available options. Press it again to edit the highlighted parameter. Press and hold the ENV knob to return to the previous menu.

Envelope Parameters		
Attack	0 .. 127	Attack time
Decay	0 .. 127	Decay time
Sustain	0 .. 127	Sustain level
Release	0 .. 127	Release time
Amount	-63 .. +63	Adjust the output level of the envelope. Negative values invert the envelope signal.
Vel Amt	0 .. 127	Set the velocity sensitivity of the envelope
Mod Dst	[list]	Select the parameter to be modulated

LFOs

There are four low frequency oscillators (LFOs) per voice, each of which can be routed to one or more modulation destinations. To select the LFO you would like to edit, turn the LFO knob. The selected LFO's current settings will be displayed, and the Rate, Level, and Wave knobs can be used to directly adjust their respective parameters.

Click the LFO knob to access additional settings. Turn the LFO knob to scroll through the available options. Click it again to edit the highlighted parameter. Press and hold the LFO knob to return to the previous menu.

LFO Parameters		
Rate	0 .. 127	Modulation rate (0 is stopped, 1 is slowest, 127 is fastest)
Depth	0 .. 127	Adjust the depth of modulation of the LFO
Wave	Triangle, Sawtooth, Ramp, Square, Sample & Hold	Select the LFO waveform
Mod Dst	[list]	Select the parameter to be modulated
Key Snc	Off/On	When enabled, the LFO resets on each new note
MIDIClk	Off, [list]	When Off, LFO rate is controlled directly with Rate knob. Otherwise, Rate is set to SYNC and the value here sets a multiple of the incoming the MIDI clock
Polar	Bi/Uni	LFO is either Uni-polar (all values between 0 and Depth) or Bi-polar (values between -Depth to +Depth)

Filters

Each voice contains two two-pole multi-mode filters in series, which can be combined to form various low-pass, high-pass, and bandpass filter topologies. Use the Cutoff and Resonance knobs to adjust the filter frequency and resonance. Resonance, or Q, causes a peak at the cutoff frequency. At high resonance settings, the filters will self-oscillate.

To access other filter parameters, click the VCF knob. The filter frequency can be increased or decreased based on the note played, for a more natural sound throughout the keyboard range. Additionally, OSC3 can modulate the filter at audio frequencies, creating metallic and bell-like tones. Note that OSC3 Level can be at 0 if it is being used purely for modulation.

Filter Parameters		
Cutoff	0 .. 127	Cutoff frequency
Reso	0 .. 127	Resonance (note: at high resonance settings, the filters will self-oscillate)
Type	4-pole low-pass, 2-pole low-pass, 4-pole high-pass, 2-pole high-pass, 2-pole bandpass	Filter topology
Key Amt	0 .. 127	Amount by which the note played affects the cutoff frequency
Aud Mod	0 .. 127	Level of filter frequency modulation from OSC3

Modulation Matrix

Parva's Modulation Matrix enables you to route signals from the envelopes, LFOs, and external controllers to virtually any synthesis parameter. From the main menu, turn the A knob until Mod Matrix is highlighted, then click the knob to enter the matrix. Turn the A knob again to scroll to the desired modulation slot. If there is an existing route, you can use the B knob to adjust the modulation level directly. Or, click the A knob again to edit the routing settings. The first setting is the modulation source. Turn the B knob to select your desired source. Turn the A knob to highlight the destination setting, and use the B knob to choose a destination. Turn the A knob once more, then use the B knob to set the amount of modulation. Press and hold the A knob to return to the previous menu.

Modulation Sources		
OFF	LFO1	ENV1
MIDI Velocity	LFO2	ENV2
MIDI Aftertouch	LFO3	ENV3
MIDI ModWheel	LFO4	ENV4

Modulation Destinations		
OSC1 Frequency	VCF Cutoff Frequency	ENV1 Level
OSC2 Frequency	VCF Resonance	ENV2 Level
OSC3 Frequency	VCF Audio Modulation	ENV3 Level
Global Oscillator Frequency	VCA Level	ENV4 Level
OSC1 Level	Pan Left/Right	Global Envelope Level
OSC2 Level	LFO1 Frequency	ENV1 Attack Time
OSC3 Level	LFO2 Frequency	ENV2 Attack Time
Noise Level	LFO3 Frequency	ENV3 Attack Time
OSC1 PWM	LFO4 Frequency	ENV4 Attack Time
OSC2 PWM	Global LFO Frequency	Global Envelope Attack Time
OSC3 PWM	LFO1 Level	ENV1 Decay Time

Modulation Destinations		
Global Oscillator PWM	LFO2 Level	ENV2 Decay Time
	LFO3 Level	ENV3 Decay Time
	LFO4 Level	ENV4 Decay Time
	Global LFO Level	Global Envelope Decay Time
		ENV1 Release Time
		ENV2 Release Time
		ENV3 Release Time
		ENV4 Release Time
		Global Envelope Release Time

Voice Settings

These settings control overall aspects of the Parva's sound. For example, a change to the Envelope Response from exponential to linear will change it for all four envelopes. Since the Voice settings are saved with a patch, each slot in a Multi Mode setup can have different Voice settings. This allows you to create a multi program using both clean and dirty oscillators, a mono voice plus a Polyphonic patch, different bend ranges per voice, and so on.

Voice Parameters		
Voice Cfg	Poly, Unison, Mono	Select the voice configuration
Spread	0 .. 127	Pan the available voices left and right to create a sense of space
Detune	0 .. 24	Detune each voice by a different amount for a thicker, more organic sound
Legato	Off/On	Select whether notes re-trigger or not
Bend Up	0 .. 96	Upward bend range in semitones
Bend Dn	0 .. 96	Downward bend range in semitones
Env Resp	Exp/Lin	Changes the Envelope Attack, Decay, and Release curves
Clean OSC	Off/On	Off boosts the volume which can add some grit and distortion to the oscillators

Patches

Parva can store up to 384 patches in six banks (A-F) of 64. Patches contain all of the synthesis parameters covered in the previous sections of this manual. From the main menu, turn the A knob until the Patch option is highlighted, then click the A knob to enter the patch menu. From here, you can load, save, or delete any patch, or you may rename the currently active patch.

To load a patch, select Load and click the A knob to enter the menu. Use the A knob again to scroll through the available patches, or turn the B knob to skip to the next bank. When the patch you wish to load is highlighted, press the A knob. To exit without loading a patch, press and hold the A knob. The process for saving and deleting patches is the same as for loading.

To rename the current patch, select Rename and click the A knob. Turn the A knob to move the cursor, and the B knob to select a letter or number to enter. Click the A knob once more to save the new name. Names can be up to 16 characters long.

Multi Mode

(EDIT - expand)

Multi Mode allows you to combine multiple patches in a variety of ways. A multi program is made up of eight slots, which hold patch and voice configuration information. You can specify the patch to be used, number of voices to allocate, the MIDI channel offset from the global setting, as well as the note range to respond to. Create layers, splits, and multi-timbral sounds, in any combination.

Multi Mode Parameters		
Patch	A00 .. F63	Select the patch to load
Voices	0 .. 8	Number of allocated voices
Channel	0 .. 15	MIDI Channel offset (added to the global channel setting)
Low Key	0 .. 127	Lowest MIDI note to respond to
High Key	0 .. 127	Highest MIDI note to respond to

Global Settings

Global settings control basic aspects of the Parva like the MIDI Channel and what patch is loaded on power up. This is where the firmware version is displayed and also where the Filter Tune option is found.

Global Settings		
MIDI Channel	0 .. 16	Select the MIDI receive channel (1 to 16). 0 is Omni mode
Startup	LAST, INIT, A00	This patch will be loaded when the Parva starts up. LAST loads the last patch used, INIT loads the INIT patch, and A00 loads whatever patch you have saved in that slot.
Firmware		Displays the Mainboard and Voicecard OS levels
Tune VCF	Off/On	Clicking will initiate the Filter tuning process. As each voice's filter is tuned, the number will be displayed. NOTE - this process will take up to 5 minutes and may generate tones or pops during the process. Turn down your monitors and be patient.

Tips and Techniques

Back Panel

The back panel audio connections are arranged in 2 rows. The Left and odd number outputs are across the bottom row and the Right and even number outputs are across the upper row. The individual outputs are TRS jacks with the Left output on the Tip and the Right output on the Ring. Use a typical Insert cable (TRS to dual TS connectors) to split any individual voice out to a Left/Right pair. In multi mode, this will allow control over dynamic panning of each voice.

Also note that both Pan and Spread effects the positioning of voices in the stereo field. Pan (as controlled via MIDI CC values) precisely locates a voice. Spread adds an offset to the pan setting based on voice number to create a wider field of sound. If Pan is center for all voices, the effect of using Spread is more noticeable. However, creative combinations of Pan and Spread can be used to create truly wide and dynamic stereo fields of sound. Note that high values of Spread can override Pan settings.

Oscillators

The oscillator levels are wide ranging and can have a large influence on the overall sound even before filtering takes place. The oscillators can be set to a clean mode or not based on the Clean OSC setting found in the Voice menu. Turning Clean Off increases the volume of the oscillators. Note that overdriving the oscillators will cause clipping and introduce additional harmonics, which can be a useful feature if more grit is needed for a particular sound.

Creating a 3 oscillator patch will all oscillator levels set to 127 will guarantee that the filter input is being overdriven. Here are some approximate values to use for a single oscillator in the current (0.4) OS if a loud but not overdriven sound is desired.

Clean OSC Off: Triangle, Sawtooth level = 40 or less; Square level = 32 or less
Clean OSC On: Triangle, Sawtooth level = 90 or less, Square level = 60 or less

When two or three oscillators are sounding, the Filter input can be more easily overdriven. Use the above numbers as guidelines and make adjustments using your ears.

MIDI Mappings

CC	Parameter	Range	Notes
10	Spread	0 .. 127	
12	Oscillator Slop	0 .. 15	
13	Pan	0 .. 127	
14	Noise Level	0 .. 127	
15	OSC1 Range	-60 .. +60	Semitone steps
16	OSC1 Fine	-50 .. +50	Cent steps
17	OSC1 Wave	1 .. 53	1 = Sawtooth, 2 = Triangle, 3 .. 50 = PWM
18	OSC1 Level	0 .. 127	
19	OSC1 Glide	0 .. 127	Lower values are faster
20	OSC2 Range	-60 .. +60	Semitone steps
21	OSC2 Fine	-50 .. +50	Cent steps
22	OSC2 Wave	0 .. 53	1 = Sawtooth, 2 = Triangle, 3 .. 50 = PWM
23	OSC2 Level	0 .. 127	
24	OSC2 Glide	0 .. 127	Lower values are faster
25	OSC2 Sync	0 .. 1	Sync to OSC1
26	OSC3 Range	-60 .. +60	Semitone steps
27	OSC3 Fine	-50 .. +50	Cent steps
28	OSC3 Wave	0 .. 53	1 = Sawtooth, 2 = Triangle, 3 .. 50 = PWM
29	OSC3 Level	0 .. 127	
30	OSC3 Glide	0 .. 127	Lower values are faster
31	OSC3 Sync	0 .. 1	Sync to OSC1
33	Global OSC Range	-60 .. +60	Semitone steps
34	Global Glide	0 .. 127	Lower values are faster
39	LFO1 Rate	0 .. 127	
40	LFO1 Wave	0 .. 4	0 = Triangle, 1 = Saw, 2 = Ramp, 3 = Square, 4 = Sample & Hold

CC	Parameter	Range	Notes
41	LFO1 Level	0 .. 127	
42	LFO1 Destination	0 .. 47	See Mod Matrix for list
43	LFO1 Key Sync	0 .. 1	0 = off, 1 = on
44	LFO2 Rate	0 .. 127	
45	LFO2 Wave	0 .. 4	0 = Triangle, 1 = Saw, 2 = Ramp, 3 = Square, 4 = Sample & Hold
46	LFO2 Level	0 .. 127	
47	LFO2 Destination	0 .. 47	See Mod Matrix for list
48	LFO2 Key Sync	0 .. 1	0 = off, 1 = on
49	LFO3 Rate	0 .. 127	
50	LFO3 Wave	0 .. 4	0 = Triangle, 1 = Saw, 2 = Ramp, 3 = Square, 4 = Sample & Hold
51	LFO3 Level	0 .. 127	
52	LFO3 Destination	0 .. 47	See Mod Matrix for list
53	LFO3 Key Sync	0 .. 1	0 = off, 1 = on
54	LFO4 Rate	0 .. 127	
55	LFO4 Wave	0 .. 4	0 = Triangle, 1 = Reverse Saw, 2 = Saw, 3 = Square, 4 = Sample & Hold
56	LFO4 Level	0 .. 127	
57	LFO4 Destination	0 .. 47	See Mod Matrix for list
58	LFO4 Key Sync	0 .. 1	0 = off, 1 = on
70	VCF Cutoff	0 .. 127	
71	VCF Resonance	0 .. 127	
72	VCF Key Amount	0 .. 127	
73	VCF AM	0 .. 127	
75	VCF Type	0 .. 4	0 = LP4, 1 = LP2, 2 = HP4, 3 = HP2, 4 = BP2
76	Envelope 1 Amount	-63 .. +63	
77	Envelope 1 Velocity	0 .. 127	
78	Envelope 1 Attack	0 .. 127	
79	Envelope 1 Decay	0 .. 127	

CC	Parameter	Range	Notes
80	Envelope 1 Sustain	0 .. 127	
81	Envelope 1 Release	0 .. 127	
82	Envelope 2 Amount	-63 .. +63	
83	Envelope 2 Velocity	0 .. 127	
84	Envelope 2 Attack	0 .. 127	
85	Envelope 2 Decay	0 .. 127	
86	Envelope 2 Sustain	0 .. 127	
87	Envelope 2 Release	0 .. 127	
102	Envelope 3 Destination	0 .. 47	See Mod Matrix for list
103	Envelope 3 Amount	-63 .. +63	
104	Envelope 3 Velocity	0 .. 127	
105	Envelope 3 Attack	0 .. 127	
106	Envelope 3 Decay	0 .. 127	
107	Envelope 3 Sustain	0 .. 127	
108	Envelope 3 Release	0 .. 127	
109	Envelope 4 Destination	0 .. 47	See Mod Matrix for list
110	Envelope 4 Amount	-63 .. +63	
111	Envelope 4 Velocity	0 .. 127	
112	Envelope 4 Attack	0 .. 127	
113	Envelope 4 Decay	0 .. 127	
114	Envelope 4 Sustain	0 .. 127	
115	Envelope 4 Release	0 .. 127	