Arctic Pro Synthesizer / Vocoder

User Guide

version 1.1

Introduction

This guide is a reference to Arctic Pro's features to help you get the best from this powerful synthesizer/vocoder. Arctic Pro is a modern subtractive synthesizer. It does not aim to accurately model or re-create vintage synthesizers of yesteryear, there are plenty of other great apps for that. Instead Arctic Pro offers the contemporary synthesist a rude, rough, bold and tough palette of sound to get stuck into.

This manual assumes that you know the basics of subtractive synthesis. Some excellent learning resources are presented at the end of this guide.

Arctic Pro can be very demanding on CPU usage. The 32-bit floating point audio engine runs at 44.1KHz. We recommend that you use at least an iPad 2 with a sample buffer of 512 samples. With more recent iPad generations you can try lowering the sample buffer to 256 samples to improve latency. Slower hardware, very complex patches, or running multiple apps may experience audio buffer overflows. When this happens the audio will breakup. Try either increasing the sample buffer size, reducing the complexity of the patch or closing other apps.

Arctic Pro is compatible with Audiobus and MIDI

The Development Team
Peter Johnson (code, concept, design)
Logan Dowell (graphic design)
John "Skippy" Lehmkuhl (factory patches, synth guru)
Carl Helder (beta testing, ideas, everything else)

Online Resources
For Arctic Pro support, visit the One Red Dog website
For latest news updates follows us on Twitter

About John "Skippy" Lehmkuhl
PluginGuru.com

John has worked as a professional sound designer since 1988 for Korg - making patches, combinations, drum kits as well as creating the sample data for almost every synth Korg has released since the M1. He has also worked with all the major synthesizer manufacturers creating patches for some of the most popular and powerful synthesizers including factory voicing for Korg M1, Wavestation, KARMA, Z-1, OASYS, Roland V-Synth, Spectrasoncis Trilogy and Omnisphere, and Native Instruments Absynth.

Basic Operation

Interface Overview

1 Control Bar

2 Settings Menu

3 Panel Bar

4 Current Parameter panel

5 Keyboard Control Bar

6 Pitch Bend and Mod Wheels
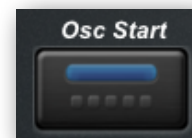
7 Virtual Piano Keyboard

Dials

Tap the centre of the dial to see it's numeric value. Double tap the centre of the dial to reset to the default value. To change the value of the dial, tap and hold, slide your finger up and down. For rotary operation slide your finger clockwise or anti-clockwise.
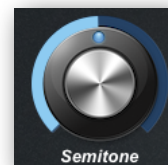
Buttons

Tap the button to turn it on and off. When on, the button will light up blue.

Switches

Tap the switch button to change the position of the switch. The current position is shown with a blue LED light.

Pop-up Menus

Tap the button to reveal the pop-up menu of available options. To make a selection tap the corresponding item inside the menu. A tick mark shows the currently selected item. This value is also displayed inside the blue button. To close, tap outside of the pop-up menu.
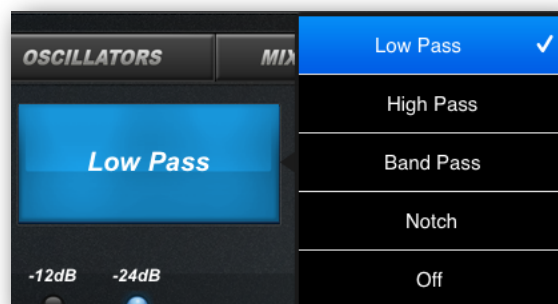
Fader

Tap on the fader cap and hold, slide you finger up and down to change the value. Tapping anywhere on the fader track will jump the fader to that position.

Wheels

There are two wheels one for pitch and one for modulation. Tap on the wheel and slider up or down to change value. The Pitch Bend wheel automatically springs back to the centre position when you release your finger. The Modulation Wheel can be assigned to various destinations. Tap the blue **Mod** button above the wheel to change the modulation destination.

X-Y Pad

There are two X-Y Pads available both are accessible via the **XY** button on the Control Bar. Tap and hold the blue button, slide your finger in any direction to change value. Double tapping the pad will reset the button to the centre. A single tap will set the button to that position. The two blue buttons at the top of the pad can be used to change the modulation destination for each of the X-Y axes. If the Pitch Bend destination is selected, the pad button will spring back to the centre when you release your finger.

The Virtual Keyboard

The Arctic Pro piano keyboard offers the full 128 note range of the MIDI standard. The virtual keyboard consists of a control bar and piano keys. Simply tap on the piano keys to sound that note.
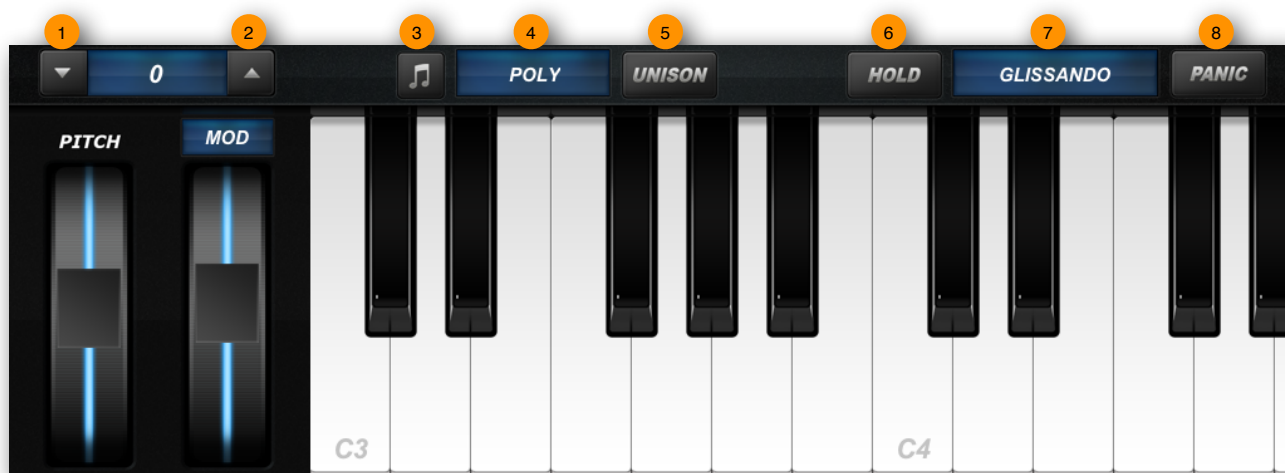
1 **Octave Down Button**

2 **Octave Up Button**

3 **Scales Mode Button** to enable the keyboard's scales mode

4 **Play Mode Button** to adjust the key mode: poly, mono, legato, arp, seq

5 **Unison Button** to enable unison voice mode on/off

6 **Hold Button** to enable hold note on/off

7 **Key Mode Button** to adjust the play mode: glissando, scroll, pitch

8 **Panic Button** to send an all notes off message to turn all sound off

3 **The Scales Mode**

When enabled the regular black and white piano keys are replaced with a set of white only keys. Only the notes in the scale are playable. The root note of the scale is shown in a darker colour and the note name is printed on the key as a reminder.

Within the **Settings** menu, there is a sub-menu setting called "Key" that allows the root note of the scale to be set. Major and minor scales may also be selected from this menu.

The piano keyboard will send only MIDI notes from the selected scale. The current scale does not restrict incoming MIDI note messages.

4 **The Play Modes**

Poly This mode allows you to play chords.

Mono This makes the instrument monophonic. If you press a key without releasing the previous one the envelopes are still re-triggered.

Legato This mode also makes the instrument monophonic but if you press a key without releasing the previous one, the pitch change and the envelopes are not re-triggered.

Arp This mode enables the arpeggiator. When active pressing a key will initiate the selected arpeggiator pattern to being (arpeggiator patterns are set from the Arpeggiator Panel, see page XX). Releasing the key will end the pattern, unless the **Hold** keyboard mode is active.

Seq This mode enables the sequencer. When active pressing a key will initiate the pattern set in the step sequencer. Sequences are created in the Sequencer Panel, page XX.

⑤ The Unison Mode

When this mode is active all four voices will be played when you press a key. The instrument is monophonic.

⑦ The Key Modes

Glissando In this mode tapping the piano keys will cause them to trigger. Sliding your finder around the keyboard will cause each individual note to play. Tapping at the top of the key (nearer the strip of control button), will strike the key softly. Tapping at the bottom of the the key, will strike the key harder.

Scroll Same as glissando except sliding your finger left and right will also adjust the current octave.

Pitch Same as glissando except sliding your finger left and right after the note has been pressed will adjust the notes pitch. Sliding your finger up and down on a pressed note will adjust the notes aftertouch.

The virtual piano keyboard also displays incoming aftertouch value as a heat strip on the note affected. This also appears when in Pitch mode and you slider your finger up and down. This shown in the image below, the higher the value the more red the strip will be.

Preset Patch Selection

The Patch Selection Panel is shown by tapping the Patch Name button on the Control Bar. The panel is split into four main sections, from left to right: operation buttons, list of banks, list of category types, list of preset patches.
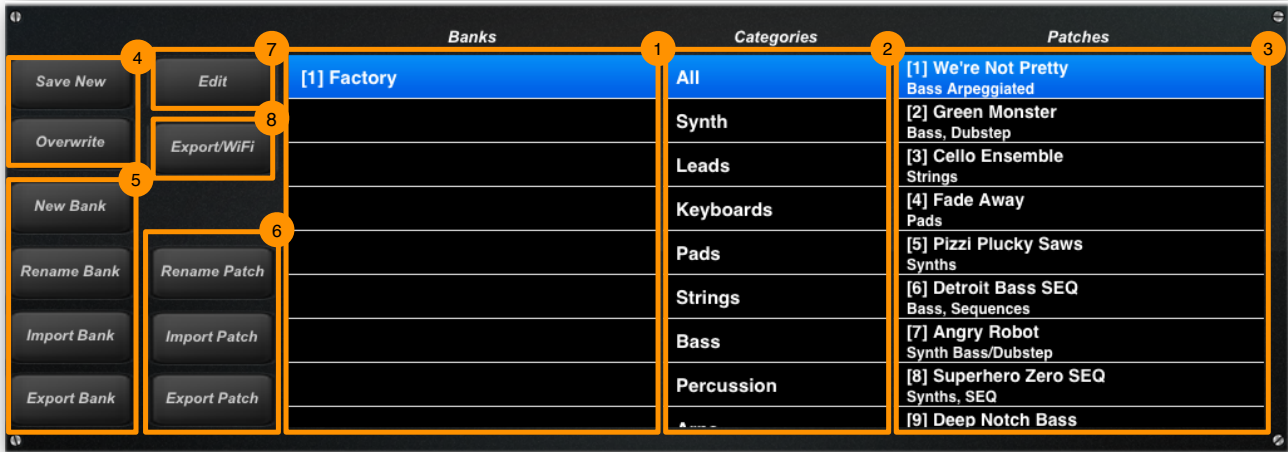
① List of banks

② List of category types

③ List of preset patches

④ Save the current patch as a new patch, or overwrite the current patch

⑤ Bank operations: new bank, rename bank, import bank, export bank

⑥ Patch operations: rename patch, import patch, export patch

⑦ Enable edit mode to reorder and/or delete banks / patches

⑧ **File Browser** view the exported audio files and Wi-Fi file sharing

> **Note**: A Bank must exist for patches to be saved, patches cannot be saved into a missing or non-existent bank

MIDI Program Change

Patches can be selected via MIDI Bank Select and Program Change messages. While a bank may contain more than 128 patches, only the first 128 can be selected by MIDI Program Change messages. Similarly, only the first 128 banks can be selected by MIDI Bank Select messages. The number in square brackets indicate the MIDI bank and patch values.

MIDI Input

Arctic Pro can be played with the internal keyboard or an external MIDI keyboard. A suitable MIDI keyboard can be connected to the iPad via a USB Core MIDI interface and the Camera Connection Kit. Alternatively a USB Class Compliant keyboard may be connected directly to the Camera Connection Kit. MIDI data can also be sent via Wi-Fi MIDI networking as well as from other apps using a virtual MIDI connection. The MIDI channel and port configuration can be changed in the **Settings** menu.

MIDI Learn

A MIDI controller can be assigned to an Arctic Pro parameter.

1. Tap on the Settings menu button
2. Tap the MIDI menu item
3. Toggle the MIDI Lean switch to ON
4. Tap on the highlighted parameter you want to assign. The highlighted parameter will turn blue.
5. On your MIDI controller, twist the desired controller dial that you want to assign to the parameter. The assignment will now be made and the corresponding MIDI controller (CC) number will be shown alongside the highlighted parameter.
6. Go back to the Settings menu and turn MIDI Lean off to return to normal operation.

   Note: MIDI controller assignments are global and applied to all patches.

Control Bar

The Control Bar is the horizontal row of buttons running along the top of the application screen. Regularly used operations are accessed from the Control Bar, but are not directly related to the sound design and performance of the synthesizer.

[1] **Patch Panel Button** displays the patch with bank and patch number. Tap to change patches via the **Patch Panel**

[2] **Patch Down/Up Buttons** to decrement and increment buttons

[3] **Save Patch Button** to save the current patch

[4] **Recorder Button** used to start and stop the Live Audio Recorder

[5] **Volume Fader** adjust the volume of the instrument including a configurable peak meter

[6] **Synthesizer Panel Button** switch to the Synthesizer parameter panels

[7] **Effects Panel Button** switch to the Effects Panels

[8] **Sequencer Panel Button** switch to the Sequencer panel

[9] **X-Y Pad Panel Button** switch to the X-Y Pad panel

[10] **Settings Menu Button** show the Settings menu

[11] **Help Button** show and remove the help overlay for the currently visible panel

③ Save Patch

When saving a patch, it is possible to change the patch name, the author's details and specify the category tags. These tags aid in organizing and finding patches from the Patch Panel's category list.
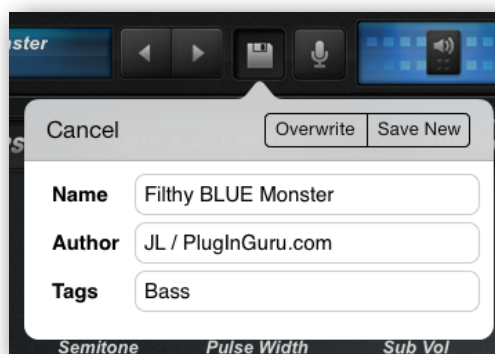
The three buttons on the popup menu's toolbar are:

Cancel close the save patch popup menu

Overwrite any changed made to the patch will be saved over the top of the current patch

Save New a new patch is saved into the currently selected bank

Note: A Bank must exist for patches to be saved, patches cannot be saved into a missing or non-existent bank

④ Live Audio Recorder

The **Recorder** button is used to start the Live Audio Recorder. Once running, any note you play on the piano keyboard and dial you adjust on the synthesizer will be recorded to a standard MIDI file. Meanwhile, the audio is saved directly to a 44.1Khz 16-bit WAV file.
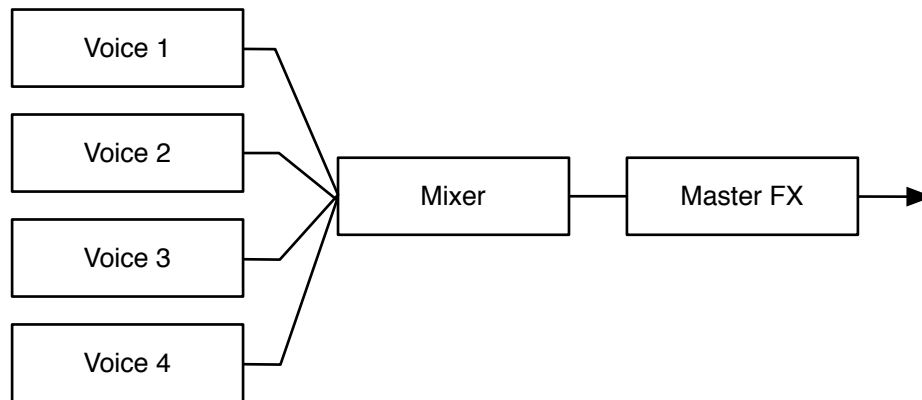
To stop the recording, tap the **Recorder** button again. The audio is automatically copied to the pasteboard ready to be pasted with AudioCopy.

The Settings menu includes a number of options to configure the Recorder.
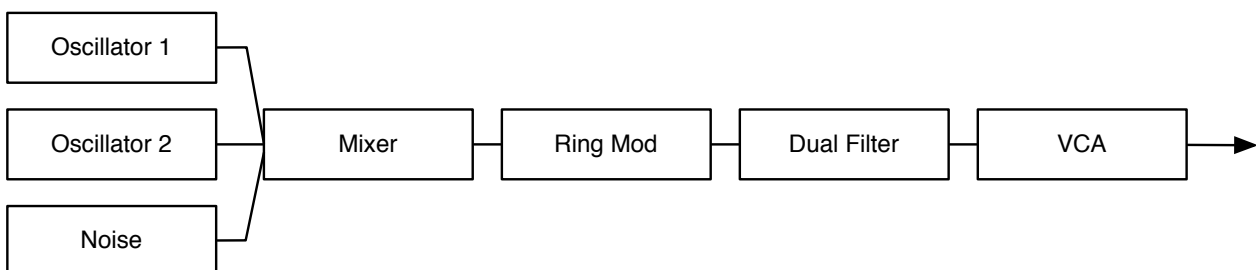
The Synthesizer

Audio Path

Below is a schematic view of Arctic Pro's audio path. There are 4 voices with the output of each voice mixed together before being sent to the stereo master effects.

```
┌──────────┐
│ Voice 1  │───┐
└──────────┘   │
┌──────────┐   │
│ Voice 2  │───┤
└──────────┘   │    ┌──────────┐    ┌──────────┐
               ├────│  Mixer   │────│ Master FX │───▶
┌──────────┐   │    └──────────┘    └──────────┘
│ Voice 3  │───┤
└──────────┘   │
┌──────────┐   │
│ Voice 4  │───┘
└──────────┘
```

Each voice contains two oscillators, a noise generator, ring modulator, dual-filter, and an amplifier. Below is a diagram of the voice audio path.

Single Voice

```
┌──────────────┐
│ Oscillator 1 │───┐
└──────────────┘   │
┌──────────────┐   │   ┌────────┐   ┌──────────┐   ┌─────────────┐   ┌──────┐
│ Oscillator 2 │───┤───│ Mixer  │───│ Ring Mod │───│ Dual Filter │───│ VCA  │───▶
└──────────────┘   │   └────────┘   └──────────┘   └─────────────┘   └──────┘
┌──────────────┐   │
│    Noise     │───┘
└──────────────┘
```

For clarity the modulation sources are not shown on these diagrams. They include:

- Two LFO's with three output destinations
- Three Envelope Generators
- 16x4 Step Sequencer
- Polyphonic and Channel Pressure Aftertouch
- Mod Wheel

There are 6 synthesizer panels viewable from the synthesizer button in the Control Bar. Each panel can be accessed from the Panel Bar buttons immediately below the Control Bar.

| OSCILLATORS | MIX & KEYBOARD | ARPEGGIATOR | LFO | FILTERS | ENVELOPES |

Oscillators Panel

There are two oscillators. The left hand parameters control Oscillator 1, the right hand Oscillator 2. There is also a sub-oscillator that is set to 1 octave below the pitch of Oscillator 1. The sub-oscillator is fixed to a square wave shape. All oscillators are accurately DSP modeled to produce alias-free audio. In the spirit of Arctic Pro, the oscillators are not modeled upon any vintage synthesizer hardware.

HyperOscillators

Both Oscillator 1 and Oscillator 2 are HyperOscillators. These lets you combine up to 8 oscillators in unison to create very thick and powerful sounds. The wave shape still applies to the HyperOscillator resulting in up to 8 layered saws, squares or triangles. The popular wave shape for this type of oscillator is the sawtooth, commonly referred to as "SuperSaw" or "HyperSaw". This is especially useful in creating Hoover style sounds, string type sounds and pads. Lush polyphonic Hoover sounds can often be heard in electronic dance and trance music genres.

In Arctic Pro, each HyperOscillator is generated using DSP algorithms that combine up to 8 separate alias-free oscillators. This results in a fine degree of real-time control over the output of the oscillator. In effect, Arctic Pro has 68 oscillators available per patch, 2 x 8 plus 1 sub oscillator, times 4 voices.

The **Spread** dial controls by how much the layered oscillators will be detuned from each other. The centre oscillator is always set to the frequency defined by the tuning and notes played. The centre oscillator governs the other oscillators and is not affected by the detuned amount.

The **Hyper Mix** dial adjusts the volume of the detuned oscillators relative to the centre oscillator. As this knob is increased, the detuned oscillators become louder, making the "super saw" sound more apparent.

① **OSC1 Wave Shape Button** used to select the different wave shapes of saw, square, triangle

② **OSC1 Semitone** used to set the tune of the oscillator in the range of +/- 48 semitones

③ OSC1 Pulse Width used to set the pulse width of the square and triangle, not available for the saw wave shape

④ Sub Vol is used to adjust the volume level of the sub-oscillator

⑤ OSC1 Hyper Button used to set the number of layered oscillators

⑥ OSC1 Spread is used to adjust the detuning amount between the layered oscillators

⑦ OSC1 Hyper Mix used to adjust the relative volumes of the detuned oscillators

⑧ Osc Start Button when ON, the oscillator phase starts from it's previous value, when OFF it is reset for each new note

⑨ OSC2 Wave Shape Button used to select the different wave shapes

⑩ OSC2 Semitone used to set the tune of the oscillator in the range of +/- 48 semitones

⑪ OSC2 Pulse Width used to set the pulse width of the square and triangle, not available for the saw wave shape.

⑫ OSC2 Env Mod is used to set the amount by which the Mod Envelope Generator modifies the pitch of the oscillator

⑬ OSC2 Sync Button when ON, sets Oscillator 2 to hard sync with Oscillator 1

⑭ OSC2 Hyper Button used to set the number of layered oscillators

⑮ OSC2 Fine is used to finely adjust the pitch of the oscillator by +/- half semitone

⑯ OSC2 Spread is used to adjust the detuning amount between the layered oscillators

⑰ OSC2 Hyper Mix used to adjust the relative volumes of the detuned oscillators

Mix & Keyboard Panel

1 **Balance** this is used to adjust the mix between Oscillator 1 and 2

2 **Osc Vol** is used to set the volume of the oscillators

3 **Ring Mod** is used to set the amount by which each oscillator is multipled

4 **Noise Vol** is used to control the level of the noise generator

5 **Color** used to adjust the filtering of the noise generator

6 **Bend Range** adjusts the amount by which the Pitch Wheel bends the notes

7 **Portamento** is used to adjust how long it take for the pitch to shift form the last pitch to the current pitch starting at the beginning of a new note

8 **Glide** adjust how long it takes for the pitch to shift from the current pitch tot he next pitch starting during the current note, finishing on the moment the next note begin

9 **Poly Aftertouch Button** is used to set the modulation destination for MIDI aftertouch

10 **Channel Pressure Button** is used to set the modulation destination for MIDI Channel Pressure aftertouch

11 **MW / AT Depth Button** is used to toggle the operation of the **Wheel Depth / AT Depth** dial

12 **Wheel Depth / AT Depth** adjusts the amount by which the modulation source modifies the destination, where the source is the Mod Wheel or MIDI Aftertouch

13 **Slide Curve** adjusts the curvature of the slide from linear to exponential

14 **Unison Spread** is used to adjust the detuning amount between voice when **Unison** is enabled

Arpeggiator Panel
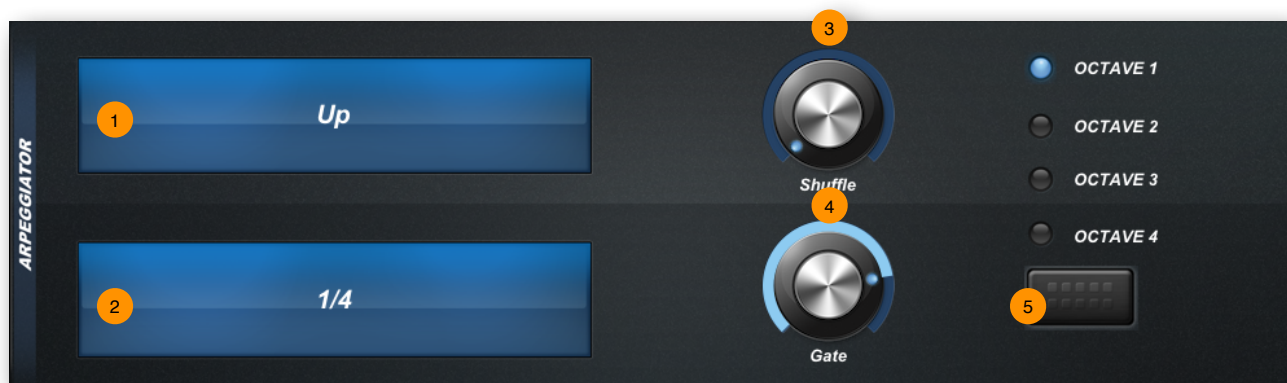
① **Pattern Button** is used to adjust the order in which the held notes are played

    Up plays from lowest to highest note

    Down plays from highest to lowest note

    Up/Down plays from lowest to highest and back to lowest

    Assign plays notes in the order the keys where pressed

    Random plays notes randomly

    Chord plays all the notes at the same time

② **Timing Button** is used to set the timing division

③ **Shuffle** adjusts the timing shuffle or swing between each note

④ **Gate** adjusts the length of each note

⑤ **Octave Range Button** is used to set the octave range of the notes

The **Sequencer** and the **Arpeggiator** share the same BPM settings. The tempo is set from the **Settings** menu.

For the **Arpeggiator** to operate the keyboard **Play Mode** must be set to **Arp**.

The **Arpeggiator** does not schedule and transmit MIDI note data.

    Note: If the arpeggiator does not seems to be working, check the the MIDI settings to ensure that External Sync is OFF. If External Sync is set to ON, the arpeggiator uses and external clock source and Arctic Pro must be receiving MIDI Clock messages in order for the arpeggiator to run.

LFO Panel

The LFO section consists of two LFO's each with three routable modulation destinations. The follow diagram shows how each LFO is structured.
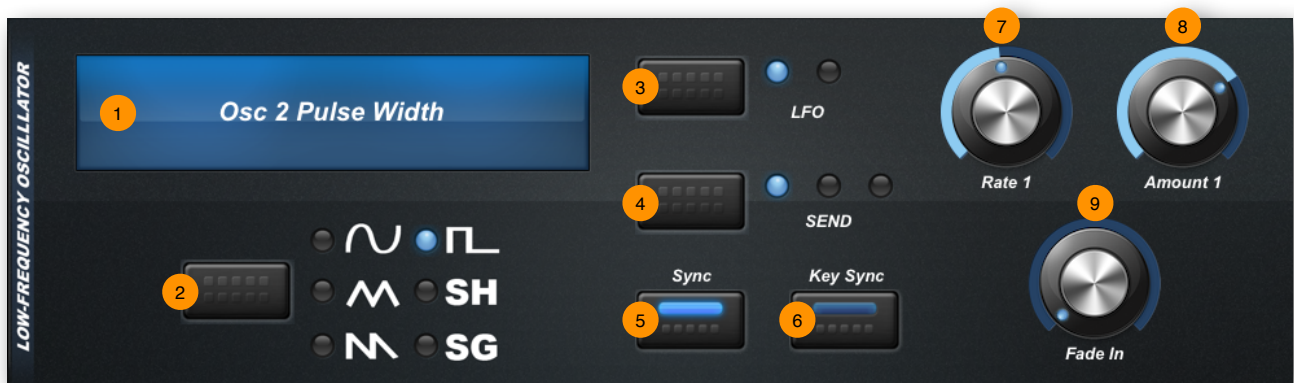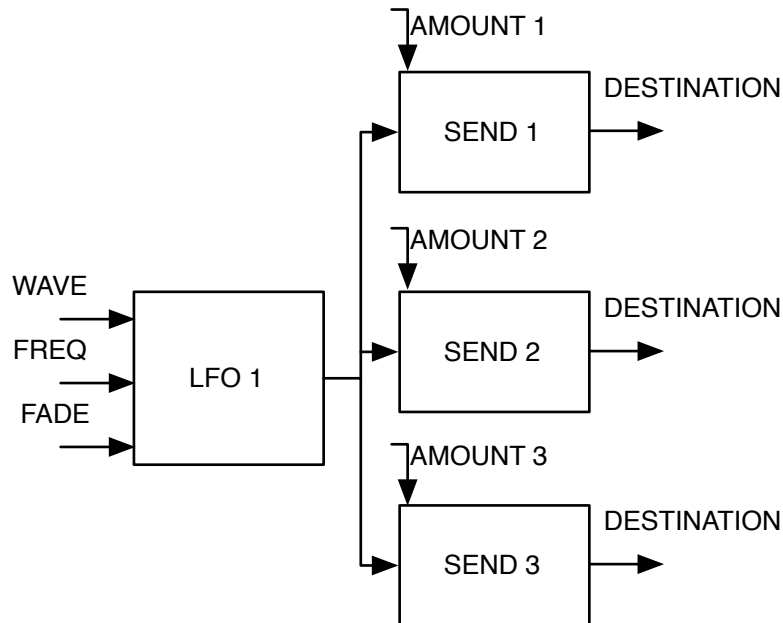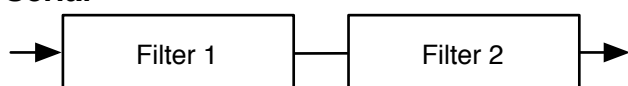
1 **LFO Destination Button** is used to select the modulation destination. Default is OFF

2 **Wave Shape Button** used to select the wave shape used by the LFO. This applies to each of the 3 destinations. Independently set for each LFO

3 **LFO Selection Button** is used to switch between LFO1 and LFO2

4 **Destination Selection Button** used to switch between the 3 destinations. Independently set for each LFO

5 **Sync Button** when ON, the LFO is synchronized to the tempo BPM and **Rate** adjusts the clock division

6 **Key Sync Button** when ON, the LFO is synchronized to each new note on

7 **Frequency Rate** is used to adjust the frequency of the LFO

8 **Amount** is used to adjust the amount by which each send is applied to its destination

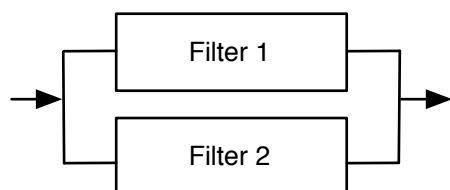**9** **Fade In** adjusts the time before the LFO is heard

Filters Panel

Arctic Pro contains two filters per voice. The parameters on the left control Filter 1, and the right Filter 2. Both filters are multimode filters offering low-pass, high-pass, band-pass and notch (band-reject) modes. Both filters also provide -12dB (2-pole) and -24dB (4-pole) roll-off curves. The audio path through the filters may be adjusted so that they operate in serial, parallel, or split routing, as shown in the diagrams below.
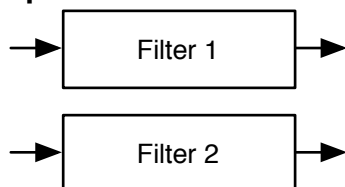
Serial

```
──▶  ┌──────────┐        ┌──────────┐
     │ Filter 1 │────────│ Filter 2 │──▶
     └──────────┘        └──────────┘
```

Parallel

```
          ┌──────────┐
       ┌──│ Filter 1 │──┐
       │  └──────────┘  │
──▶ ───┤                ├──▶
       │  ┌──────────┐  │
       └──│ Filter 2 │──┘
          └──────────┘
```

Split

```
──▶  ┌──────────┐ ──▶
     │ Filter 1 │
     └──────────┘

──▶  ┌──────────┐ ──▶
     │ Filter 2 │
     └──────────┘
```

In the **Split** routing Oscillator 1 will in fed into Filter 1 and output via the left audio channel. Likewise, Oscillator 2 will be fed into Filter 2 and output via the right audio channel.

To achieve an individual routing using only one filter, simply select **Serial** routing and turn off Filter 2.

① **Filter 1 Type Selection Button** used to select the filter mode: low-pass, high-pass, band-pass, notch

② **Filter 1 Slope Button** used to select the roll-off: -12dB (2-pole) or -24dB (4-pole)

③ **Filter 1 Velocity Button** when ON, the velocity sensitivity from the keyboard is used to modulate the filter

④ **Filter 1 Cutoff** adjusts the frequency at which the filter starts cutting. If the cutoff frequency in a low-pass filter is set to a very low value, only the lowest harmonics (bass) will pass through

⑤ **Filter 1 Resonance** adjusts the Q or emphasis of the frequencies around the cutoff point

⑥ **Filter 1 Env Mod** adjusts the amount by which the **Filter Envelope** modulates the cutoff frequency

⑦ **Filter 1 Key Follow** adjusts the amount by which the filter tracks the keyboard

⑧ **Filter 2 Type Selection Button** used to select the filter mode: low-pass, high-pass, band-pass, notch

⑨ **Filter 2 Slope Button** used to select the roll-off: -12dB (2-pole) or -24dB (4-pole)

⑩ **Filter 2 Velocity Button** when ON, the velocity sensitivity from the keyboard is used to modulate the filter

⑩ **Filter 2 Cutoff** adjusts the frequency at which the filter starts cutting. If the cutoff frequency in a low-pass filter is set to a very low value, only the lowest harmonics (bass) will pass through

⑪ **Filter 2 Resonance** adjusts the Q or emphasis of the frequencies around the cutoff point

12 **Filter 2 Env Mod** adjusts the amount by which the **Filter Envelope** modulates the cutoff frequency

13 **Filter 2 Key Follow** adjusts the amount by which the filter tracks the keyboard

14 **Routing Buttons** is used used to set the audio routing path

Envelopes Panel

There are three envelope generators. They are hard wired to each module in the synthesizer such at the **Mod** is used on Oscillator 2, **Filter** is used on the filters, and **Amp** is used on the VCA. All three envelopes are of the classic ADSR type with an adjustable curvature.
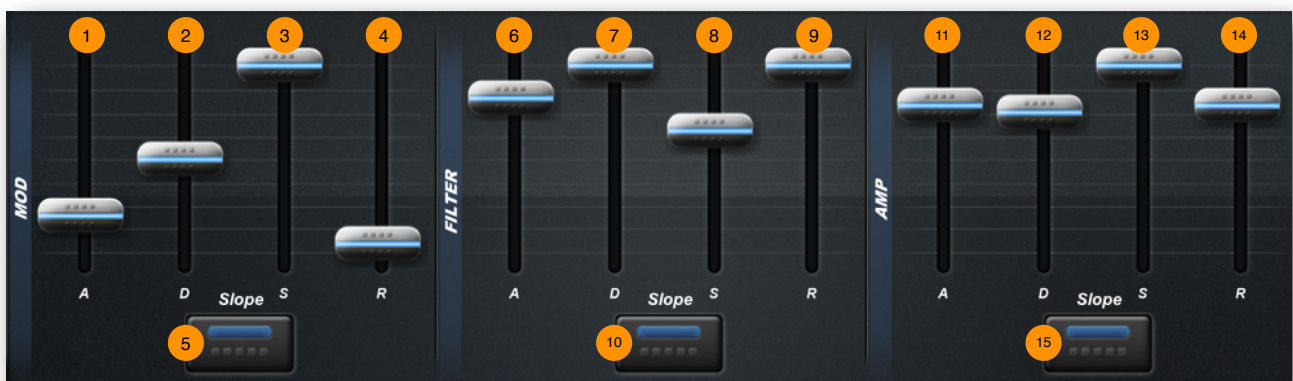
1 **Mod Attack Fader** adjusts the attack time between 0.01 and 8 seconds

2 **Mod Decay Fader** adjusts the decay time between 0.01 and 8 seconds

3 **Mod Sustain Fader** adjusts the sustain level, 0 to 100%

4 **Mod Release Fader** adjusts release time between 0.01 and 8 seconds

5 **Mod Slope Button** when ON, adjusts the slope interpolation between each stage of the envelope. When at zero it is a linear line between each point, whereas adding more curvature produces a rounder line or scoop, more exponential

6 **Filter Attack Fader** adjusts the attack time between 0.01 and 8 seconds

7 **Filter Decay Fader** adjusts the decay time between 0.01 and 8 seconds

8 **Filter Sustain Fader** adjusts the sustain level, 0 to 100%

9 **Filter Release Fader** adjusts release time between 0.01 and 8 seconds

[10] **Filter Slope Button** when ON, adjusts the slope interpolation between each stage of the envelope. When at zero it is a linear line between each point, whereas adding more curvature produces a rounder line or scoop, more exponential

[11] **Amp Attack Fader** adjusts the attack time between 0.01 and 8 seconds

[12] **Amp Decay Fader** adjusts the decay time between 0.01 and 8 seconds

[13] **Amp Sustain Fader** adjusts the sustain level, 0 to 100%

[14] **Amp Release Fader** adjusts release time between 0.01 and 8 seconds

[15] **Amp Slope Button** when ON, adjusts the slope interpolation between each stage of the envelope. When at zero it is a linear line between each point, whereas adding more curvature produces a rounder line or scoop, more exponential

Master Effects

There are 7 master effects that are applied to the mix of all the voices. The effect panels are viewable from the FX button in the Control Bar. As with the synthesizer panels, each effect panel can be accessed from the Panel Bar immediately below the Control Bar. Active effects are shown with a blue light.
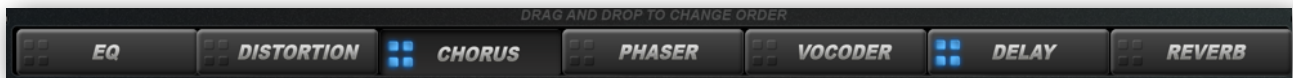

The order in which each effect is applied to the audio path can be changed. Tap and hold an effect panel button, the button will become free of the panel bar, then slide your finger left and right to reposition the button back on to the panel bar, lifting your finger places the button. The buttons will shuffle to indicate the new effect order thus changing the audio path.

EQ Panel

① **Effect On/Off Button** used to bypass the effect

② **Low** is used to adjust the level of the low range band

③ **Mid** is used to adjust the level of the mid-range band

④ **High** is used to adjust the high range band

Distortion Panel
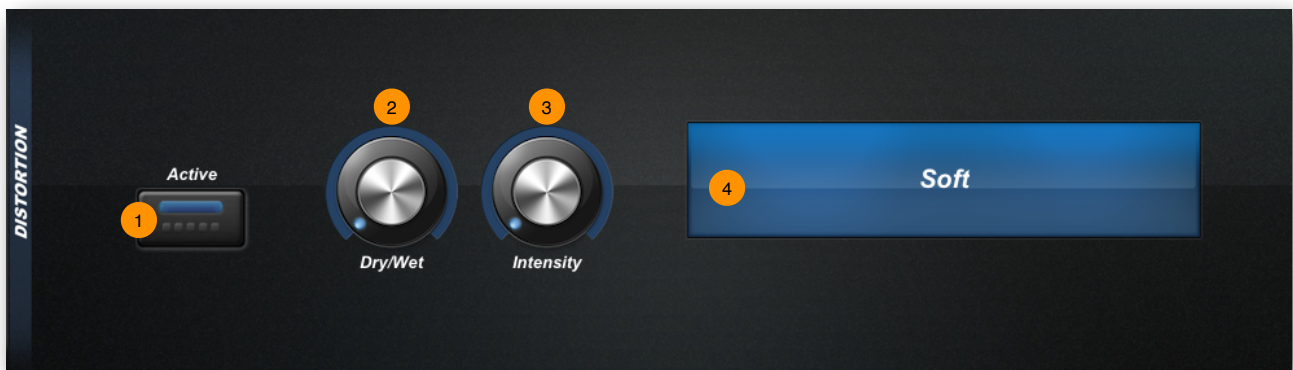
1   **Effect On/Off Button** used to bypass the effect

2   **Dry/Wet** the mix between the incoming signal and effected outgoing signal

3   **Intensity** is used to adjust the level of the distorted signal

4   **Distortion Type Button** is used to select the type of distortion: soft, digital, overdrive, bit reducer, rate reducer, bit saturator

Chorus Panel

1   **Effect On/Off Button** used to bypass the effect

2   **Wave Shape Button** is used to select the wave shape used by the LFO: sine, triangle, sawtooth

3   **Dry/Wet** the mix between the incoming signal and effected outgoing signal

4   **Frequency** adjusts the rate at which the LFO oscillates

5 **Depth** is used to adjust the intensity of the effect

6 **Delay** is used to set the amount of time before you hear the chorus

7 **Feedback** is used to adjust how much of the chorus output is added to the input

Phaser Panel

1 **Effect On/Off Button** used to bypass the effect

2 **Wave Shape Button** is used to select the wave shape used by the LFO: sine, triangle, sawtooth

3 **Dry/Wet** the mix between the incoming signal and effected outgoing signal

4 **Rate** adjusts the rate at which the LFO oscillates

5 **Depth** is used to adjust the intensity of the effect

6 **Feedback** is used to adjust how much of the phaser output is added to the input

7 **L/R Cross** adjusts the amount by which the left and right channels cross over

8 **Phase** adjusts the amount by which the left channel is out of phase with the right channel

Vocoder Panel

The Vocoder operates on two signals: the formant and carrier, the former modulates the latter. The modulation signal is called the *formant* because it forms and shapes the basic synthesizer *carrier*. The *carrier* is the signal coming from the synthesizer, it is called the *carrier* because it carries the formant signal.

You usually use a human voice as the formant, and the synthesizer as the carrier. The Vocoder has the effect of making the synthesizer speak. Good results can be achieved with lush synthesizer sounds, such as strings, brasses, pads or any sound with a nearly constant dynamic. Chords may be used to give the result more depth.

When used in conjunction with a suitable microphone, e.g. Apple EarPods with Remote and Mic[1], or an Apogee MiC[2], your voice can be used as the formant input of the Vocoder.

The Vocoder consists of 16-bands of filters that can be used to modify the sound. These bands are split into 4 banks of 4.
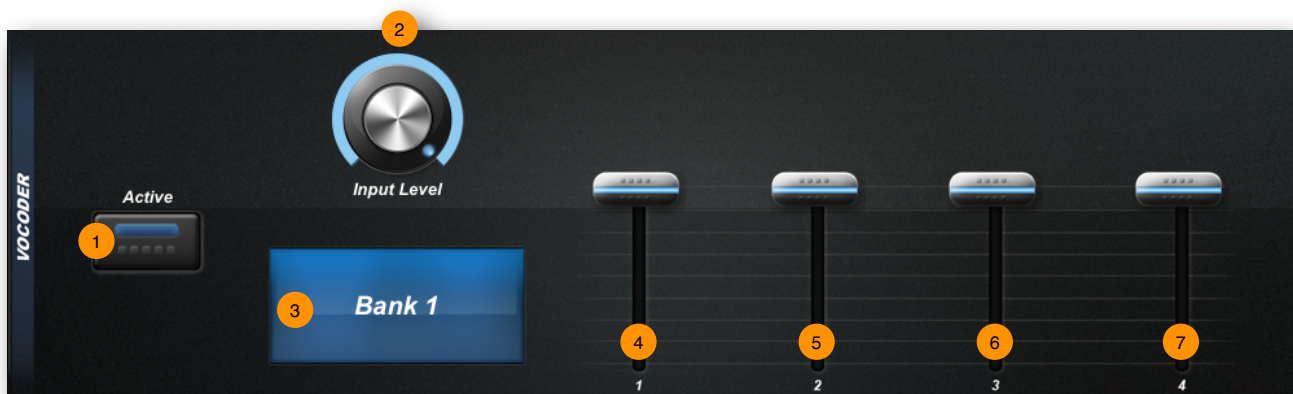
[1] **Effect On/Off Button** used to bypass the effect

[2] **Input Level** is used to adjust the input level from the micrphone

[3] **Bank Button** is used to select the bank of faders

[4] **Band 1 Fader** adjusts the filter band 1, 5, 9, 13

[5] **Band 2 Fader** adjusts the filter band 2, 6, 10, 14

[6] **Band 3 Fader** adjusts the filter band 3, 7, 11, 15

[7] **Band 4 Fader** adjusts the filter band 4, 8, 12, 16

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[1] Available from the Apple Store

[2] Available from Apogee Electronics

Delay Panel

1 **Effect On/Off Button** used to bypass the effect

2 **Sync Button** when ON, synchronizes the delay time with the tempo BPM

3 **Dry/Wet** the mix between the incoming signal and effected outgoing signal

4 **Left Delay** is used to adjust the delay length on the left channel, from 0 to 2000ms

5 **Right Delay** is used to adjust the delay length on the right channel, from 0 to 2000ms

6 **Feedback** is used to adjust how much of the delayed output is added to the input causing the echo to regenerate

7 **Coloration** is a low pas filter applied to the delayed signal rolling off the high frequencies on each regeneration

Reverb Panel

① **Effect On/Off Button** used to bypass the effect

② **Dry/Wet** the mix between the incoming signal and effected outgoing signal

③ **Roomsize** is used to adjust the size of the simulated room

④ **Damping** is used to adjust the roll dampening of the reflections

⑤ **Width** is used to adjust the stereo width of the reverb effect

The Sequencer

The Arctic Pro sequencer is more like an original analogue sequencer than the familiar computer based MIDI sequencers. The sequencer comprises four 16-step sequences or tracks that play in parallel. Each track can be routed to a different modulation destination and each step in the sequence can be set to a different value. These values are then used to modulate the chosen destination. Like the arpeggiator, there is one sequencer that applies to all voices.

Note that the sequencer does not actually schedule MIDI data, nor does it transmit MIDI data. A sequence is a series of events at timed intervals that changes the value of one of the synth's parameters in fixed steps. As the four tracks play in parallel, up to four parameters may be changed by each step. This also means that chord based melodies can be sequenced. The sequencer does not have to include note or pitch events. With no note events present, the sequencer can modulate only the synth's parameters.

The Arctic Pro sequencer is a gated sequence; it requires a note on message to be gated and start running. This may come from the virtual piano keyboard or from an external MIDI source. The pitch of this note is used to transpose the pitch of any sequenced notes. A note value at middle-C (MIDI note 60) will pitch the sequencer at zero and ensure any melodic lines play as programmed. A note value higher than middle-C will transpose up, while one lower will transpose down.

The sequence duration is set by the BPM tempo and clock divide settings, or MIDI clock if synced to an external clock source.

1. The 16 value sliders for each step

2. Step button for each of the 16 steps

3. Setup menu to adjust each track's modulation destination

4. Skip forward a step when in record mode

5. Adjust the amount of shuffle or swing in the sequence timing

6 Track selector buttons numbered 1 to 4

The step buttons have a number of different modes of operation that can be cycled through by tapping the button several times.

OFF button is black and step value is skipped

RED record mode, when you press a piano key the step value is entered based on the
note value

BLUE step is on

GREEN repeat, track is set to the first value

Ensure that there is no RED step button when playing back the sequencer.

To change the value at each step, slider your finger up and down the value bar. The sequencer and the arpeggiator share the same BPM settings.

To activate and play the sequencer the **Play Mode** must be set to **SEQ**.

The sequencer does not schedule and transmit MIDI note data.

Note: If the sequencer does not seem to be working, check the MIDI settings to ensure that External Sync is OFF. If External Sync is set to ON the sequencer uses an external clock source and Arctic Pro must be receiving MIDI clock messages in order for the sequencer to run.

Settings Menu

The Settings Menu allows for global adjustment of parameters and system operation.
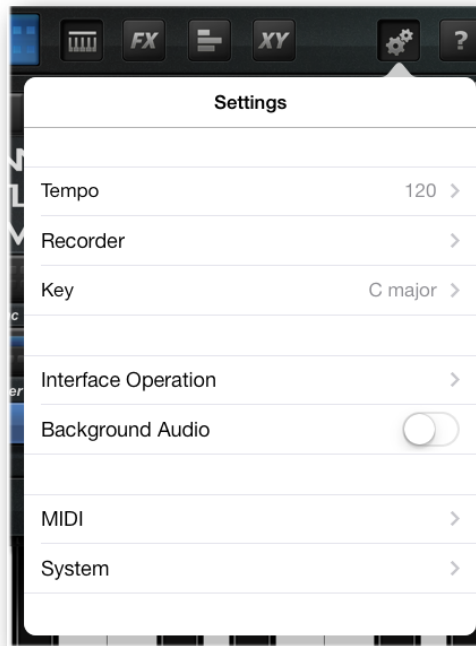
Tempo
Adjust the global tempo in Beat Per Minute. This defines the tempo used by the Arpeggiator and Sequencer. A button is also available to tap the tempo with your finger.

Recorder
Configure the operation of the audio phrase recorder.

> **Metronome** Turn an audible metronome click off/on

> **Metronome Volume** Adjust the volume of the metronome click

> **Lead-In** Wait for one bar before recording starts

> **Start on first key** Start recording immediately on the first note down, or first received MIDI input.

> **Length in bar** Set the overall length of the recording

Key Select the root note from which the keyboard's scale starts. Used when the virtual piano keyboard is in Scale Modes.

Interface Operation Adjust how the user interface operates

> **Knobs** Adjust how sliding your finger over a dial changes it's value. Linear is up / down, rotary is in clockwise / anti-clockwise movement.

> **Peak Meter** Configure what is displayed on the Control Bar's peak meter.

> **Keyboard Size** Set the size of the piano keys.

> **Velocity Sensitivity** Enable virtual velocity sensitivity on the virtual piano keyboard. Tapping the key at the top produces a softer strike, at the bottom a harder strike.

MIDI Configure the MIDI channel, input and output port that the instruments sends and received MIDI data through. These settings are also used to configure the Core MIDI virtual ports and Wi-Fi MIDI networking.

> **Local Control** This option is used for turning local control on or off. The default setting is ON. When local control is OFF, Arctic Pro will not trigger internal sounds when using the piano keyboard. Arctic Pro will only make sounds when triggered by incoming MIDI data. However, MIDI data is still sent out.

> **External Sync** This option is used to enable or disable external synchronisation. When set to ON, Arctic Keys will respond to MIDI Clock messages and synchronise the arpeggiator and sequencer to this clock and tempo. The recorder and transport controls are disabled.

Background Audio Enabled or disable the output of audio while the app is running in the background.

System This options allows the initialization of the current patch to a default value and the restoration of the Factory Patches to their default values.

File and Audio Sharing

The File Browser shows files that are stored in the application's Documents folder. Items in this folder are also available when using iTunes File Sharing.

Audio files may be shared in several different ways: via Sonoma AudioCopy, exported to and opened by another application on the iPad, or sent via email.

1 Show the list of available audio files
2 Show the list of available MIDI files
3 Enable Wi-Fi file sharing
4 The file list
5 Preview the selected audio file
6 Rename the selected file
7 Delete the selected file
8 Use the iOS Open-In feature to open the selected file in another app

Wi-Fi Transfer

The Wi-Fi Transfer allows you to access the files in the Documents folder from a web browser on another computer, such as Safari on a Mac. When activated, the required web address is displayed and this should be entered into Safari's (or IE, Chrome, Firefox, etc) address bar. Note that Wi-Fi Transfer uses port 8080. Ensure that this port is open in the firewall on the computer running the web browser.

Learn More

Gordon Reid's Synth Secret Series
http://www.soundonsound.com/sos/allsynthsecrets.htm

Howard Scarr's Programming Analog Synthesizers
http://www.zorchmusic.com/hscarr/Virus_Tutorial_English.zip

Fred Welsh's Synthesizer Cookbook
http://www.synthesizer-cookbook.com