1010music

nanobox | fireball
User Guide
V 1.0.10

WELCOME

Bring some heat to your music creation workflow with nanobox | fireball, a polyphonic wavetable mini synthesizer with intuitive touchscreen control. Featuring eight voice polyphony, two wavetables and an oscillator, Fireball unlocks a huge array of sounds—from punchy and aggressive leads to atmospheric pads. Touchscreen X/Y control allows you to instantly morph and shape sounds with the swipe of a finger. Choose from hundreds of professionally designed presets and wav files, or quickly create your own patches with deep parameter control via the 2" touchscreen. Integrate fireball seamlessly with your existing tabletop gear—or create on-the-go thanks to a compact design that fits in the palm of your hand.

FIRMWARE VERSION

This User Guide is based on Version 1.0.10 of the nanobox | fireball firmware. To see which version is on your product, push the Home button to go to the main dashboard, then push the Left Arrow button to go to the nanobox Config screen. The loaded firmware version is displayed at the top of the screen, just to the left of the rotating tempo icon. Version 1.0.10 is available for download for free at https://forum.1010music.com, after you register for the forum. The instructions for downloading and installing the firmware are included near the end of this document, and are in the downloads section of the forum.

Firmware Version

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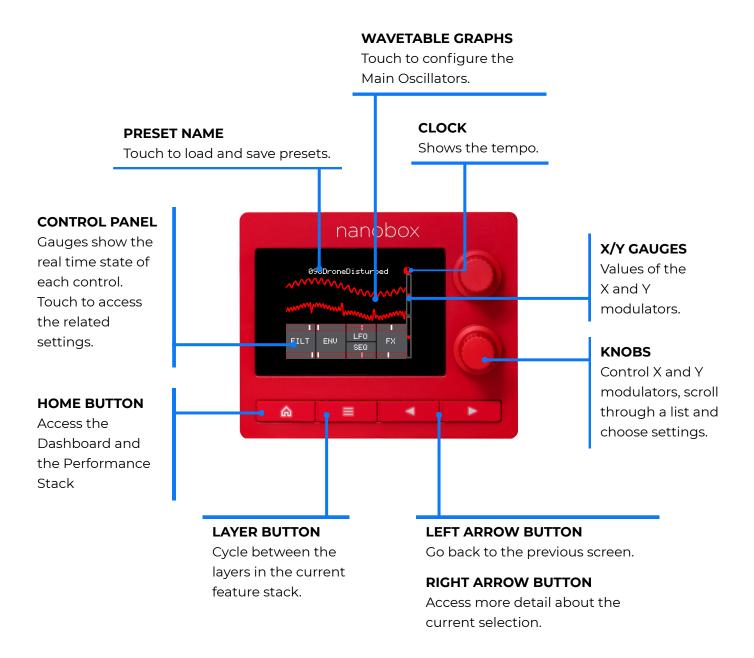
QUICK START GUIDE

GET SET UP

1. Insert the microSD card if it's not already inserted. The card must be in the slot for fireball to load. The card is spring-loaded. Push to eject when needed, but leave it in for now.

2. Connect the stereo Line Out to your mixer, speakers or headphones. Be sure to use a TRS cable to hear both channels.

3. Connect an optional MIDI controller to the MIDI IN jack. TRS Type A and B are supported. Use the included adapter to connect to controllers that use MIDI 5 Pin DIN.

4. Connect the USB power cable. fireball can be powered by a standard 5V, 500 mA USB power adapter or USB battery. fireball will start up as soon as it receives power.

5. Play notes on the MIDI controller or the Grid Keyboard screen and you are making music!

FIND YOUR WAY AROUND

WAVETABLE GRAPHS
Touch to configure the Main Oscillators.

PRESET NAME
Touch to load and save presets.

CLOCK
Shows the tempo.

CONTROL PANEL
Gauges show the real time state of each control. Touch to access the related settings.

X/Y GAUGES
Values of the X and Y modulators.

KNOBS
Control X and Y modulators, scroll through a list and choose settings.

HOME BUTTON
Access the Dashboard and the Performance Stack

LAYER BUTTON
Cycle between the layers in the current feature stack.

LEFT ARROW BUTTON
Go back to the previous screen.

RIGHT ARROW BUTTON
Access more detail about the current selection.
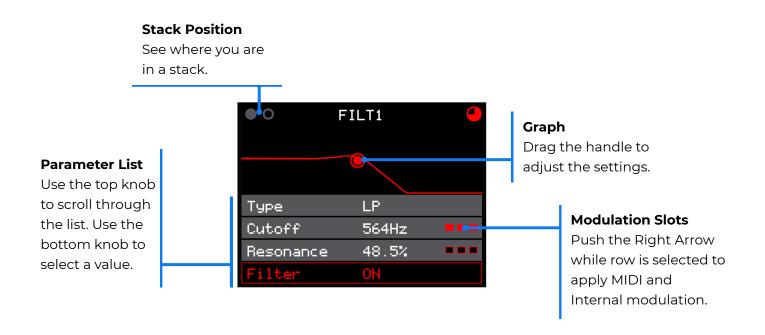
ACCESS THE DASHBOARD AND PERFORMANCE CONTROLS

DASHBOARD

Watch the oscillators and controls react to Note Triggers. Touch the waves or a button to configure the related parameters . Turn the knobs to control the Macro X and Macro Y Modulators.

Performance Stack

X/Y MODULATOR

Touch the screen and turn the knobs to adjust the sound in real time.

GRID KEYBOARD

Trigger notes by touching the grid. Touch the Hold button to use note toggle mode. Touch **<<** or **>>** to change octaves. Push the Right Arrow to select the scale.

NAVIGATE THE STACKS

Touch the graphs or buttons on the Dashboard to access feature stacks.

Main Oscillator Stack	Filter Stack	Envelope Stack	Modulation Stack	FX Stack
Wavetable 1	Filter 1	Envelope 1	LFO 1	FX 1
Wavetable 2	Filter 2	Envelope 2	LFO 2	FX 2
Oscillator			Sequencer	

Push the **Layer Button** to cycle through a feature stack.

Performance Stack

Performance Stack
X/Y Modulator
Grid Keyboard

SET THE CONTROLS

Stack Position
See where you are in a stack.

FILT1

Type	LP	
Cutoff	564Hz	
Resonance	48.5%	
Filter	ON	

Graph
Drag the handle to adjust the settings.

Parameter List
Use the top knob to scroll through the list. Use the bottom knob to select a value.

Modulation Slots
Push the Right Arrow while row is selected to apply MIDI and Internal modulation.

ACCESS HIGH LEVEL CONFIGURATION OPTIONS

Preset Name
Touch to load and save presets.

120NewAgeMemory

| nanobox Configuration |

◄

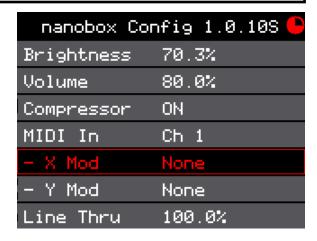FILT　ENV　LFO　SEQ　FX

►

| Preset Configuration |

Push the **Left Arrow** and **Right Arrow** buttons from the Dashboard to configure settings at the nanobox level and at the preset level.

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ADJUST THE VOLUME AND BRIGHTNESS

To adjust the volume and screen brightness:

1. Push Home to go to the Dashboard if not already there.

2. Push the Left Arrow button to go to the nanobox Config screen.

3. Use the knobs to adjust the values of the Brightness and Volume parameters.

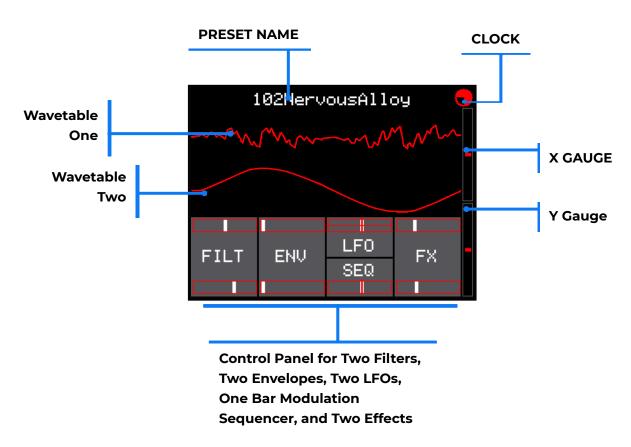| nanobox Config 1.0.10S	
Brightness	70.3%
Volume	80.0%
Compressor	ON
MIDI In	Ch 1
– X Mod	None
– Y Mod	None
Line Thru	100.0%

EXPLORE THE SOUNDS

- Touch the Preset Name at the top of the Dashboard to select a different preset.

- Try the Modulation Wheel on your MIDI Controller with different presets to add sometimes subtle, sometimes surprising effects.

- Turn the knobs on the dashboard and drag your finger on the X/Y Modulation Grid to explore how each preset uses the X and Y modulators.

- Set the Line Thru amount on the nanobox Configuration screen to control how much of the Line Input signal is sent to the FX engine.

THE DASHBOARD

The dashboard is your window into what nanobox | fireball is doing. Here you can see the waveform configured for each of the two granulators, monitor the state of each of the audio control features, and access all of the features available.

You can get to the dashboard by pushing the Home button from any other screen.

SEE AND TOUCH

PRESET NAME · CLOCK · Wavetable One · Wavetable Two · X GAUGE · Y Gauge · FILT · ENV · LFO · SEQ · FX · **Control Panel for Two Filters, Two Envelopes, Two LFOs, One Bar Modulation Sequencer, and Two Effects**

Preset Name

Displays the currently selected preset. Touch to choose a different preset or save your settings to the current preset or a new preset. Load a preset without saving to go back to the last saved settings.

Clock

Icon rotates one quarter turn for each beat in a 4/4 measure. Push the Right Arrow while on the Dashboard to see the Preset Config Screen where you can change the tempo.

Wavetable One and Two

The graph represents a single cycle of the wavetable for the oscillator. The graph is animated to show the behavior of the earliest triggered note that is still playing. Touch a graph to open the Wavetable Settings for that oscillator. From the Wavetable Settings screen, you can navigate through the stack to access the third waveform oscillator.

X and Y Gauges

X and Y are two manually controlled modulation sources. These gauges show their current values, with zero in the middle. From the dashboard, turn the top knob to control X and the bottom knob to control Y. You can also control X and Y from the XY Modulator Screen and via MIDI. Go to the modulation settings for a parameter to configure X or Y to control that parameter.

Control Panel - FILT

The top and bottom gauges display the Cutoff (for Low Pass and High Pass filters) or Center Frequency (for Notch and Band Pass filters) for FILT1 and FILT2. If the gauges are moving, this value is being controlled by a modulation source. Touch the panel to access the Filter Settings stack.

Control Panel - ENV

The top and bottom gauges displays the level of the signal as controlled by the envelope for ENV1 and ENV2. The gauges move to show how the envelope is applied over time. Touch the panel to access the Envelope Settings stack.

Control Panel - LFO/SEQ

The top two gauges display the current value being output by LFO1 and LFO2. The bottom gauge displays the current value being output by the SEQ. Touch the panel to access the LFO + SEQ Modulation stack.

Control Panel - FX

The top and bottom gauges display the value of the primary parameter for each effect:

Flanger+Dist: Rate

Chorus: Depth

Phaser: Depth

Delay: Wet Amount

Reverb: Wet Amount

If the gauges are moving, this value is being controlled by a modulation source. Touch the panel to access the FX Settings stack.

TWIST

Top Knob

Control the value of the X Modulator.

Bottom Knob

Control the value of the Y Modulator

PUSH

Home

Cycle between the X/Y Modulator Screen and the Dashboard.

Layer

Access the Grid Keyboard, and then cycle between the Grid Keyboard and the XY Modulator Screen.

Left Arrow

Open the nanobox Config screen, where you can control settings that apply across presets, such as brightness, volume and MIDI channel.

Right Arrow

Open the Preset Config screen, where you can control high level preset settings, such as BPM an Bend Range.
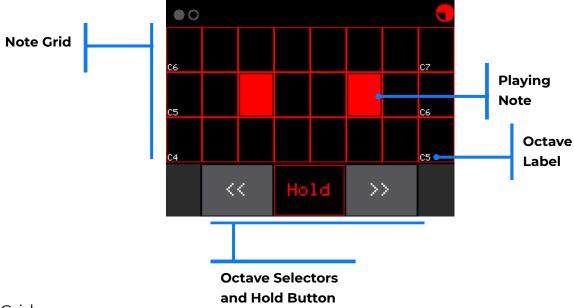
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MAKE SOME MUSIC

To make sound with nanobox, you trigger notes via the Grid Keyboard screen or a MIDI controller. You can tweak the sound in real time by adjusting parameters and by controlling the X & Y Modulators from either the Dashboard or the X/Y Modulator screen. All sound is sent to the Line Out jack.

GRID KEYBOARD

The Grid Keyboard allows you to play notes that are always on key. Each row in the grid corresponds to one octave. You can choose which scale to use.

Push the Layer button from the Dashboard or the XY Modulator Screen to access the Grid Keyboard. Push the Right Arrow button from here to get to the Keyboard Config screen where you can select a scale.

SEE AND TOUCH

Note Grid

Touch a cell in the note grid to trigger that note. If Hold is enabled, the note will play until you touch it again. Otherwise, the note will end when you stop touching it. The number of notes in the grid will vary based on the selected scale.

Playing Note

Currently playing notes are highlighted red. Touch a playing note to clear it.

Octave Label

The first and last cell in each is labeled with the octave mapped to that row.

Octave Selectors

Touch the left and right chevrons to scroll the grid one octave.

Hold Button

Touch the Hold button to toggle it's state. When inactive (gray), notes only play while you are touching them. When active (black with red outline), notes continue to play until you touch them a second time.

Keyboard Config Screen

Push the Right Arrow button to access the Keyboard Config Screen where you can set the scale.

Parameter	Description	Modulation Target?
Scale	The scale imposed by the keyboard grid. Chromatic, Major, Major Pent, Minor, Minor Pent, Minor Blues, Raga Bhairav, Raga Todi, Gypsy, Arabian, Egyptian, Miyakobushi, Ryukyu, Wholetone, Diminish, Harmonic Minor, Mel Minor, Dorian, Phrygian, Lydian, Mixolydian, Aeolian, Locrian	No
Root Note	A, A#, B, C, C#, D, D#, E, F, F#, G, G#	No

TWIST

Top Knob

Not used on the Grid Keyboard screen. On the Keyboard Config screen, select a parameter to edit.

Bottom Knob

Not used on the Grid Keyboard screen. On the Keyboard Config screen, select a value for the currently selected parameter.

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PUSH

Home

Go back to the Dashboard.

Layer

Toggle to the XY Modulator Pad.

Left Arrow

Go back to the Dashboard.

Right Arrow

Go to the Keyboard Config screen to select a scale.

MIDI CONTROLLER

Nanobox is designed to work with your MIDI controller to trigger notes and control the sound. Keyboard and pad controllers can trigger notes, while knobs and sliders can be mapped to control parameters. The standard MIDI modulators like velocity, after touch and mod wheel are supported.

Hardware Connection

Connect your MIDI controller to the TRS MIDI In jack. The system will automatically recognize if the MIDI controller uses Type A or Type B TRS MIDI connections and use the correct one. Use the included adapter to connect to a MIDI 5 Pin DIN device. Nanobox does not support USB MIDI.

MIDI Channel

You can control which MIDI channel nanobox will listen to. From the Dashboard, push the Left Arrow button to access the nanobox Config screen. Set the value of the MIDI In Parameter to be the channel used by your MIDI controller to send note and CC information. We will dive into MIDI CC control of parameters later.

Play Some Notes

You can now use your MIDI controller to play notes on Nanobox.

NOTE: The Hold button on the Grid Keyboard does not impact notes received via MIDI. The Grid Keyboard does not show notes that have been triggered by MIDI.
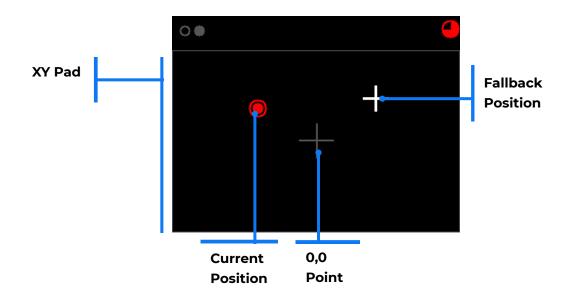
XY MODULATOR PAD

The XY Modulator Pad allows you to use touch gestures and knobs to control the X and Y modulation sources. Each factory preset is configured to map the X and Y modulators to one or more parameters that will add interesting dimension to the sound. The XY pad only affects sounds that are currently playing. Trigger a note with the Hold function on the Grid Keyboard screen, and then push the Layer button to jump over to the XY Modulator Pad to perform live audio modulations. These are the same XY modulators shown and controlled on the Dashboard.

From the Dashboard, push the Home button to toggle to the XY Modulator Pad. From the Grid Keyboard, push the Layer button to toggle to the XY Modulator Pad.

To hear the XY Modulators in action, load the preset 095Windy. In this preset, the X modulator is mapped to WT1 Position, Filt1 Resonance and Cutoff, and LFO1 Rate. The Y modulator is mapped to WT2 Position, Filt2 Center Frequency and Q, and LFO2 Rate. Use the Hold button and trigger some notes on the Grid Keyboard, then push the Layer button to go to the XY Pad. Drag your finger slowly in one direction at a time and hear how the sound evolves.

SEE AND TOUCH

XY Pad — Fallback Position — Current Position — 0,0 Point

<u>XY Pad</u>

Touch the screen to move the X and Y modulator values. You can tap to make a momentary change, or hold and drag for longer, sweeping changes. Drag left and right to control the X modulator, up and down to control the Y modulator.

Fallback Position

When you release your finger from a drag motion, the X and Y values will jump to the Fallback position, indicated by the white ✚ icon. Turn the knobs to adjust the fallback position.

Current Position

The red ball indicates the current position of the X and Y modulators. If you turn the knobs to move this, it will move with the Fallback Position. When you drag, the Current Position will be different from the Fallback Position.

0,0 Point

The gray ✚ icon does not move. It represents the point where X and Y are both zero.

TWIST

Top Knob

Control the value of the X Modulator and set the fallback position.

Bottom Knob

Control the value of the Y Modulator and set the fallback position.

PUSH

Home

Go back to the Dashboard.

Layer

Toggle to the Grid Keyboard.

Left Arrow

Go back to the Dashboard.

Right Arrow

Not used.

CONFIGURE THE SOUND GENERATION

Fireball uses wavetable synthesis to generate sounds that range from breathy winds, to plucky marimbas, and from bright bells to deep basses. At the heart of the sound engine are two wavetable oscillators and one waveform oscillator. Each preset uses a different combination of WAV files, oscillators and audio settings to generate a unique sound. Customize each wavetable oscillator by choosing a WAV file from the microSD card and adjusting the pitch and position settings. Change the shape of the waveform oscillator to further hone the sound: choose from a saw, triangle, square, sine or noise waveform. Control how much each oscillator contributes to the sound by adjusting the level. You can further customize the sound via the 2 filters, 2 envelopes, 2 LFOs, 1 modulation sequencer and 2 effects engines accessed from the Dashboard. You can then save these settings as a new preset for later use. All of your settings are saved on the microSD card.

You can also use the fireball effects on a live audio input signal. Connect the audio signal to the Line In and this signal will be added to the inputs to the effects engine.
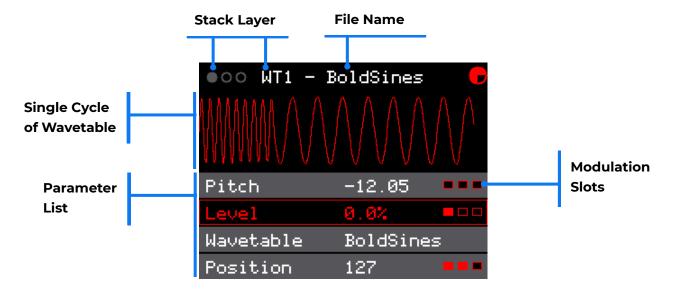
This section describes how to configure the wavetable oscillators and waveform oscillator that generate the sound.

WAVETABLE OSCILLATORS

Two of the three oscillators used to generate sound are wavetable oscillators. A wavetable oscillator is like the audio equivalent of old film movies. Each oscillator is mapped to a WAV file that contains a wavetable. Each cycle of the wavetable is like a single frame of a film. The overall sound is created by playing these cycles in series. By using different shapes in each cycle and varying the position parameter, you can add dynamics and liveliness to the sound. By repeating the same cycle, you can get a more consistent and even sound. The nanobox | fireball comes with 103 wavetables that are paired together in different combinations to create 121 presets. You can add your own wavetables to the microSD card to create your own presets. Nanobox | fireball is compatible with wavetables that contain 2048 samples per cycle and 256 cycles.

Touch a wavetable oscillator graph on the Dashboard to access this screen. Push Layer to cycle through the Oscillators.

SEE AND TOUCH

Stack Layer

The identifier of the current stack layer: WT1 and WT2 for wavetable oscillators 1 and 2, and OSC for the waveform oscillator.

File Name

The name of the wavetable file used for this oscillator. It may be truncated.

Single Cycle of Wavetable

The graph represents a single cycle from the WAV file. Touch the graph to choose a different wavetable file from the microSD card. Note that if you load your own WAV files on the microSD card, the WAV files must be configured as wavetables that contain 2048 samples per cycle and 256 cycles to be used with fireball.

Modulation Slots

The three red boxes on the right side of a parameter row indicate that the parameter may be modulated. Filled boxes are filled slots. Push the Right Arrow button to access the Modulation Parameters screen for the selected parameter.

Parameter List

Turn the top knob to select a parameter, bottom knob to select a value. The parameters are defined below. Later in the document we will discuss working with these parameters in more depth.

Parameter	Description and Range	Modulation Target?
Pitch	How many semitones up or down you want to shift the pitch. -24.00 to +24.00 semitones	Yes
Level	The relative audio level of this waveform. 0 -100%	Yes
Wavetable	The wavetable file on the microSD card that is used by this oscillator. There are over 100 wavetables included with fireball. You can also create and load your own wavetables. Push the Right Arrow button to select a different file. Nanobox	fireball is compatible with wavetables that contain 2048 samples per cycle and 256 cycles.	No
Position	Each waveform has slight variations in the different cycles of the wave. This option sets the cycle of the wave that will be looped. Use modulation to vary the position and add more dynamics to the sound. 0 to 255 cycles	Yes

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TWIST

Top Knob

Turn the top knob to select a parameter in the list.

Bottom Knob

Turn the bottom knob to set a value for a parameter in the list.

PUSH

Home

Return to the Dashboard.

Layer

Cycle through the oscillators.

Left Arrow

Return to the Dashboard.

Right Arrow

When the parameter has modulation slots, opens the modulation parameters screen.

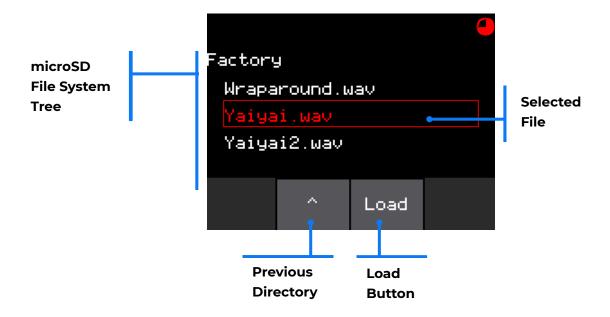When the File parameter is selected, opens the WAV File selection Screen.

WAV FILE SELECTION SCREEN

Here you can choose the WAV File from the microSD card that has the wavetable to be used for this oscillator..

To get here, touch the WAV File graph at the top of the Wavetable Oscillator screen, or push Right Arrow when the File parameter is selected on that screen.

SEE AND TOUCH

microSD File System Tree

Selected File

Previous Directory

Load Button

microSD File System Tree

Turn a knob to scroll through the list of files and directories.

Previous Directory (^) Button

Touch the ^ button to navigate back a directory in the file tree.

Load Button

Touch the Load Button to load a selected directory into the file tree or to load the selected file into the Wavetable Oscillator.

TWIST

Top Knob

Scroll through the file list.

Bottom Knob

Scroll through the file list.

PUSH

Home

Return to the Dashboard.

Layer

Not used.

Left Arrow

Return to the Wavetable Oscillator Screen.
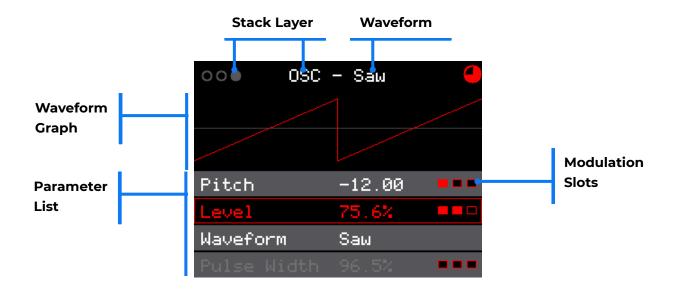
Right Arrow

Not used.

WAVEFORM OSCILLATORS

The third oscillator used to generate sound is a waveform oscillator. This oscillator can add some depth to the sound.

Touch a wavetable oscillator graph on the Dashboard, and then push the Layer button to cycle through the oscillators to get to this screen.

SEE AND TOUCH

Stack Layer

The identifier of the current stack layer: WT1 and WT2 for wavetable oscillators 1 and 2, and OSC for the waveform oscillator.

Waveform

The waveform selected for the oscillator.

Waveform Graph

The graph is a visual representation of the waveform selected.

Modulation Slots

The three red boxes on the right side of a parameter row indicate that the parameter may be modulated. Filled boxes are filled slots. Push the Right Arrow button to access the Modulation Parameters screen for the selected parameter.

Parameter List

Turn the top knob to select a parameter, bottom knob to select a value. The parameters are defined below.

Parameter	Description and Range	Modulation Target?
Pitch	The number of semitones to shift the pitch. -24.00 to +24.00 semitones	Yes
Level	The relative audio level of the oscillator waveform. 0 to 100%	Yes
Waveform	The shape of the oscillation. Saw, Triangle, Square, Sine, Noise	No
Pulse Width	Only applies when Square is selected for the Waveform. The portion of the wave that will have a high signal. A value of 50% will create a wave that is high half the time and low half the time. A value of 75% will create a wave that is high ¾ of the time and low ¼ of the time. 0 to 100%	Yes

TWIST

Top Knob

Turn the top knob to select a parameter in the list.

Bottom Knob

Turn the bottom knob to set a value for a parameter in the list.

PUSH

Home

Return to the Dashboard.

Layer

Cycle through the oscillator stack.

Left Arrow

Return to the Dashboard.

Right Arrow

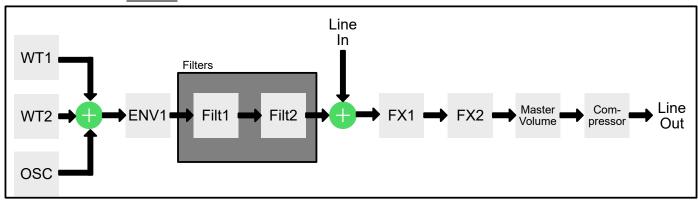When the parameter has modulation slots, opens the modulation parameters screen.

TWEAK THE SOUND

Once you have set up the oscillators to generate the sound, you can use the audio control features to tweak and enhance the sound. The nanobox | fireball audio controls include two filters, two envelopes, two LFO modulators, one bar sequencer modulator, and two effect slots.
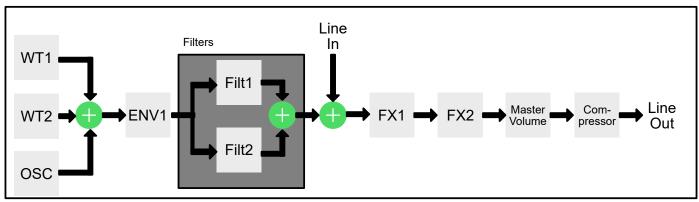
The audio engine adds the outputs of the three oscillators together, and then applies ENV1 to shape the level of the signal. The resulting signal is then sent to the filters. If Filter 2 is set to Serial Mode, the signal runs through filter 1 and the result is then run through filter 2. If Filter 2 is in Parallel Mode, the output of the envelope is sent to each of the two filters independently, and the output of the two filters is then added together. The result is then combined with the Line In signal before being processed by FX1 followed by FX2. The output of FX2 is then adjusted by the master volume. The compressor is then applied to the output. The resulting signal is then sent to the Line Out.

SIGNAL PATH

If Filt2 Mode is **Serial:**

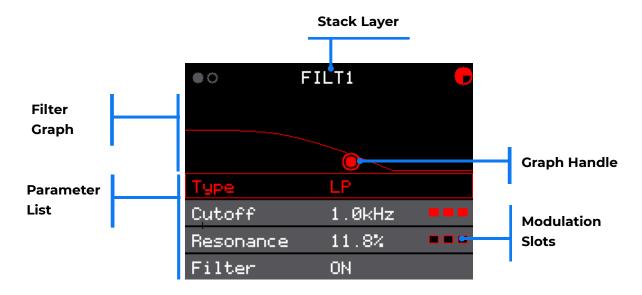If Filt2 Mode is **Parallel:**

FILTERS

Filters are used to control the frequency of the audio signal that is sent to the rest of the audio engine. The two filters may be applied either in series or parallel. The filter parameters vary based on the Type of filter selected.

Touch FILT on the dashboard to access the Filter screen, then push the Layer button to cycle through the Filter stack.

See and Touch

Stack Layer

Indicates which filter you are editing.

Filter Graph

A visual representation of the frequency ranges that will be passed through the filter.

Graph Handle

Touch and drag the graph handle to control the filter. This controls the first first two parameters in the list after the Type parameter.

Modulation Slots

The three red boxes on the right side of a parameter row indicate that the parameter may be modulated. Filled boxes are filled slots. Push the Right Arrow button to access the Modulation Parameters screen for the selected parameter.

Parameter List

Turn the top knob to select a parameter, bottom knob to select a value. The list of parameters varies based on the selected Type:

Notch   Filters out the frequencies within the range around the Center Point defined by the width.

Band Pass   Filters out the frequencies outside of the range around the Center Point defined by the width.

High Pass   Filters out the frequencies below the cutoff point.

Low Pass   Filters out the frequencies above the cutoff point.

Parameters for Low Pass and High Pass Filters

Parameter	Description and Range	Modulation Target?
Cutoff	For High Pass and Low Pass filters, the frequency where the filter begins to attenuate the signal. 20 Hz to 20.4 kHz	Yes
Resonance	For High Pass and Low Pass filters, controls how much of a boost is given to the signal near the cutoff frequency. 0 to 100%	Yes
Filter	Turns the filter On and Off.	No
Mode	Only on Filter 2. When set to Serial, Filter 2 is applied to the output of Filter 1. When set to Parallel, Filter 2 is applied to the dry signal and the outputs of the two filters are combined after processing.	No

Parameters for Band Pass Filters

Parameter	Description and Range	Modulation Target?
Center Freq	For Notch and Band Pass filters, the frequency at the middle of the notch or band. This is the frequency that will be most attenuated. 20 Hz to 20.4 kHz	Yes
Width	For Band Pass filters, the width of the frequency range around the center point included in the notch or band. 0 to 100%	Yes
Filter	Turns the filter On and Off.	No
Mode	Only on Filter 2. When set to Serial, Filter 2 is applied to the output of Filter 1. When set to Parallel, Filter 2 is applied to the dry signal and the outputs of the two filters are combined after processing.	No

Parameters for Notch Filters

Parameter	Description and Range	Modulation Target?
Center Freq	For Notch and Band Pass filters, the frequency at the middle of the notch or band. This is the frequency that will be most attenuated. 20 Hz to 20.4 kHz	Yes
Q	For Notch filters, Q controls the level of attenuation at and around the center frequency. 0 to 100%	Yes
Filter	Turns the filter On and Off.	No
Mode	Only on Filter 2. When set to Serial, Filter 2 is applied to the output of Filter 1. When set to Parallel, Filter 2 is applied to the dry signal and the outputs of the two filters are combined after processing.	No

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TWIST

Top Knob

Turn the top knob to select a parameter in the list.

Bottom Knob

Turn the bottom knob to set a value for a parameter in the list.

PUSH

Home

Return to the Dashboard.

Layer

Cycle through the two filters.

Left Arrow

Return to the Dashboard.

Right Arrow

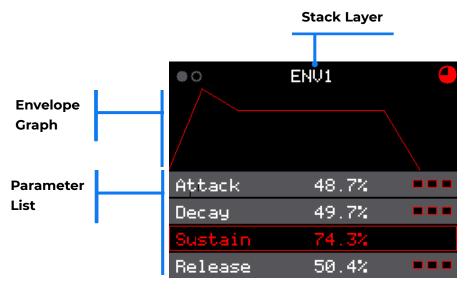When the parameter has modulation slots, opens the modulation parameters screen.

ENVELOPES

You can configure two Envelopes on nanobox | fireball. ENV1 is applied to the combined output of the three oscillators before the signal is sent to the filters. You can also apply either envelope as a modulation source for parameters with modulation slots.

From the Dashboard, touch the ENV button to access the envelopes. Then use the Layer button to cycle through the envelopes.

SEE AND TOUCH

Stack Layer

This indicates which envelope you are editing.

Envelope Graph

See how the changes in parameters affect the shaping of the sound.

Parameter List

Use the top knob to select a parameter, and the bottom knob to change it's value.

Parameter	Description and Range	Modulation Target?
Attack	The time it takes for the sound to reach the loudest level. 0 to 100%	Yes
Decay	How long it takes for the sound to go from the initial peak to the sustain level. 0 to 100%	Yes

Parameter	Description and Range	Modulation Target?
Sustain	The volume level that the sound maintains when you hold a note. 0 to 100%	No
Release	The release specifies how long the note will continue to play and fade out when the note is released. 0 to 100%	Yes
Velocity	How much impact MIDI Velocity will have on the level of the overall envelope. -100 to +100%	No

TWIST

Top Knob

Turn the top knob to select a parameter in the list.

Bottom Knob

Turn the bottom knob to set a value for a parameter in the list.

PUSH

Home

Return to the Dashboard.

Layer

Cycle through the two envelopes.

Left Arrow

Return to the Dashboard.

Right Arrow

When the parameter has modulation slots, opens the modulation parameters screen.
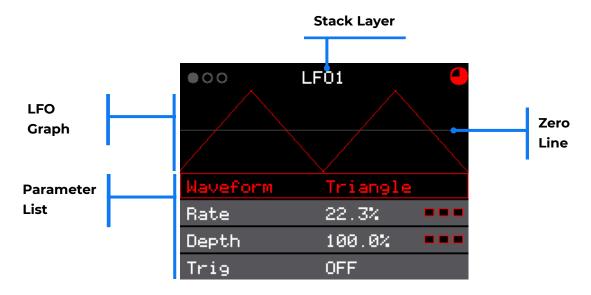
LOW FREQUENCY OSCILLATORS

The LFOs are internal modulators. They are great to use to add some life and variety to the sound. You can choose a different waveform for each of the two LFOs in nanobox | fireball.

To configure the LFOs push the LFO/SEQ button on the Dashboard. Use the layer button to cycle through the stack that has the two LFOs and the bar Sequencer.

SEE AND TOUCH

Stack Layer

This indicates which layer of the LFO/SEQ stack you are editing.

LFO Graph

See how the changes in parameters affect the shape of the modulator.

Zero Line

The light gray line indicates the zero point on the graph.

Parameter List

Use the top knob to select a parameter, and the bottom knob to change it's value.

Parameter	Description and Range	Modulation Target?
Waveform	The shape of the wave used by the low frequency oscillator. Saw, Rev Saw, Triangle, Pos Tri, Sine, Pos Sine, Square, Pos Square, Random	No
Rate	The frequency of the LFO from about 0.1Hz to 12 Hz. 0.0% to 100.0% When Beat Sync is On, this specifies the rate in beats and measure: 8, 4, 2, 1, ½, ½ T, ¼, ¼ T, 1/8, 1/8 T, 1/16, 1/16 T, 1/32, 1/32 T, 1/64 bars	Yes
Depth	The amplitude of the oscillating wave. Set this to 0 to disable the LFO. 0 to 100%	Yes
Trig	When active, the LFO will restart each time the pad is triggered. On/Off	No
Beat Sync	Controls the operation of the rate parameter. When On, the wave cycle is synchronized with the clock. On/Off	No

TWIST

Top Knob

Turn the top knob to select a parameter in the list.

Bottom Knob

Turn the bottom knob to set a value for a parameter in the list.

PUSH

Home

Return to the Dashboard.

Layer

Cycle through the two envelopes.

Left Arrow
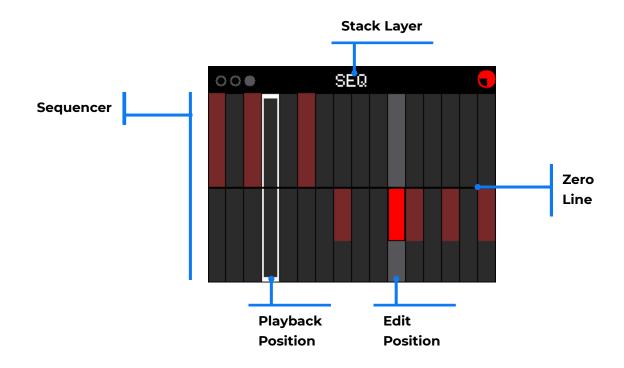
Return to the Dashboard.

Right Arrow

When the parameter has modulation slots, opens the modulation parameters screen.
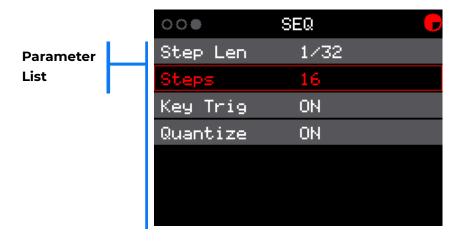
BAR SEQUENCE MODULATOR

The SEQ is a bar sequencer that is used for internal modulation. It is another great way to add some life and variety to the sound. You can set the number of steps and the step length. You can also turn on the Quantize option to snap the values to pitch frequencies.

To configure the SEQ push the LFO/SEQ button on the Dashboard, and then use the layer button to cycle through the stack until you get to the bar Sequencer.

SEE AND TOUCH

Parameter List

Stack Layer

This indicates which layer of the LFO/SEQ stack you are editing.

Sequencer

Tap or drag on the sequencer to set the value for each step in the sequence. You can also use the knobs to set the values.

Zero Line

You can drag along the zero line to reset the values to zero.

Playback Position

The white rectangle highlights the playback position of the sequence.

Edit Position

The light gray bar indicates the current position of the editor. Turn the top knob to move the position. Turn the bottom knob to change the value of the bar at the current position.

Parameter List

Push the Right Arrow button from the Sequencer to access the parameter list. Use the top knob to select a parameter, and the bottom knob to change it's value.

Parameter	Description and Range	Modulation Target?
Step Len	The length of each step in the sequence. 1/64, 1/32T, 1/32, 1/16T, 1/16, 1/8T, 1/8, 1/4T, ¼,1/2T, ½, 1 bar, 2 bar (T=Triplet)	No
Steps	The number of steps in the sequence. 2 to 32	No
Key Trig	When On, the sequencer is restarted when each note begins. When Off, it plays constantly in the background and resumes at current position when a new note is triggered (Off).	No
Quantize	When On, the levels of the sequencer are quantized to 12 distinct values (plus the off value). This allows for precise semitones in a pitch modulation. On/Off	No

TWIST

Top Knob

On the Sequencer screen, turn the top knob to select a bar to edit.

On the parameters list, turn this knob to select a parameter.

Bottom Knob

On the Sequencer screen, turn the bottom knob to set the value for the currently selected bar.

On the parameters list, turn this knob to change the value of a parameter.

PUSH

Home

Return to the Dashboard.

Layer

Cycle through the LFO/SEQ Stack..

Left Arrow

On the Sequencer screen, return to the Dashboard.

On the Parameter list screen, return to the Sequencer screen.

Right Arrow

On the Sequencer screen, this will take you to the Sequencer parameters screen.
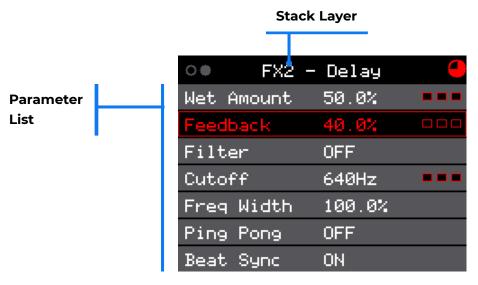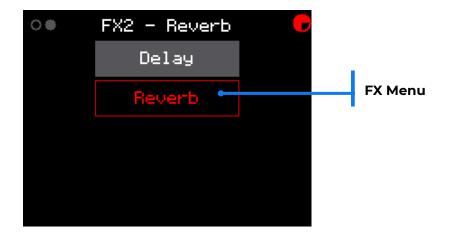
EFFECTS

Fireball has two effects slots. You can choose from Flanger+Dist, Chorus and Phaser for FX1. FX2 can use Delay or Reverb. The audio engine sends the output of the filters to FX1, which then feeds into FX2. The master volume and compressor are then applied to the output of FX2.

From the Dashboard, touch the FX button to access the FX1 screen, and then use the Layer button to cycle between FX1 and FX2.

SEE AND TOUCH

Stack Layer

Parameter List

FX2 - Delay		
Wet Amount	50.0%	■ ■ ■
Feedback	40.0%	□ □ □
Filter	OFF	
Cutoff	640Hz	■ ■ ■
Freq Width	100.0%	
Ping Pong	OFF	
Beat Sync	ON	

FX2 - Reverb

Delay

Reverb

FX Menu

Stack Layer

This indicates which effect slot you are controlling.

FX Menu

Touch the Stack Layer label to choose which effect will be used by this slot. FX1 and FX2 each have a different set of options.

Parameter List

Use the knobs to configure the effects parameters. The list of parameters varies based on which effect is selected.

Flanger+Dist Parameters

Parameter	Description and Range	Modulation Target?
Flng Depth	The depth of the flanger effect. 0.0 to 100.0%	No
Rate	The rate used to control the flanger. 0.0 to 100.0%	Yes
Feedback	The amount of feedback used in the flanger effect. 0.0 to 100.0%	No
Dist Depth	The depth of the distortion effect. 0.0 to 100.0%	No

Chorus Parameters

Parameter	Description and Range	Modulation Target?
Depth	The depth of the Chorus effect. 0.0 to 100.0%	Yes
Rate	The rate used to control the chorus. 0.0 to 100.0%	No

Phaser Parameters

Parameter	Description and Range	Modulation Target?
Depth	The depth of the Phaser effect. 0.0 to 100.0%	No
Rate	The rate used to control the effect. 0.0 to 100.0%	Yes
Feedback	The amount of feedback included in the effect. -100 to 100%	No

Reverb Parameters

Parameter	Description and Range	Modulation Target?
Wet Amount	How much of the wet signal is sent to the outputs. 100% of the dry signal is always sent. 0.0 to 100.0%	Yes
Decay	How much the reverberation will ring out. 0 to 100%	Yes
Pre-Delay	The amount of time between the original dry sound, and the audible onset of early reflections. 0 to 100%	Yes
Damping	How much dampening is applied to the reverb. Higher values will make the reverb end sooner. 0 to 100%	Yes

1010 music

Delay Parameters

Parameter	Description and Range	Modulation Target?
Wet Amount	How much of the wet signal is sent to the outputs. 100% of the dry signal is always sent. 0.0 to 100.0%	Yes
Feedback	The amount of regeneration or echo in the delayed signal. Set to 0% to get a single echo. 0.0 to 100.0%	Yes
Filter	Turn Filter On and then adjust the cutoff and width parameters to filter the delay.	No
Cutoff	When Filter is On, this is the center frequency for the band pass filter. 20 Hz to 20.4 kHz	Yes
Freq Width	When Filter is On, the width of the range of frequencies included. 0.0 to 100.0%	No
Ping Pong	When Ping Pong is on, the echoes will alternate (or ping pong) from side to side. When off, the echoes are the same in the left and right channels.	No
Beat Sync	When On, the delay is measured in musical time intervals. When Off it is controlled as a percentage.	No
Delay Len	Determines the delay length. When Beat Sync is On, delay is specified in musical intervals: 1/64, 1/32, 1/16, 1/8T, 1/16D, 1/8, 1/4T, 1/8D, ¼, 1/2T, ½, 1 bar (T=Triplet, D=Dotted) When Beat Sync is Off, delay is specified as a percentage, where 100% is 4 seconds: 0% to 100%.	Yes

TWIST

Top Knob

Select a parameter to control.

Bottom Knob

Select a value for the selected parameter.

PUSH

Home

Return to the Dashboard.

Layer

Cycle through the FX Stack.

Left Arrow

Return to the Sequencer screen.

Right Arrow

Open the Modulation Parameters screen for the selected parameter, if the parameter has modulation slots.
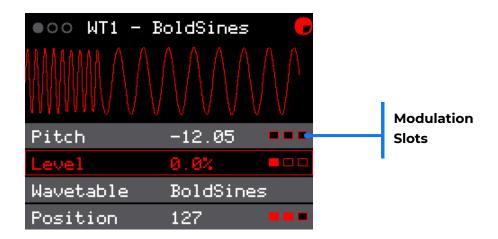
EFFECTS AND LIVE INPUT

Nanobox will add the audio signal from the Line In to the signal sent to the effects engine.
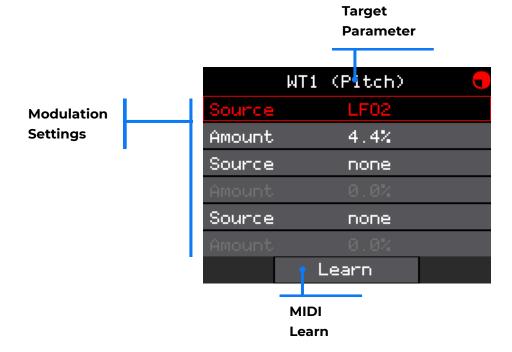
PARAMETER MODULATION

Adding variation to various parameters can make the sound more organic and interesting. Any of the parameters that have modulation slots along the right side of the parameter in a list can be controlled using internal or external modulation. The envelopes, LFOs and SEQ can be used to automate the modulation. The X and Y modulators, standard MIDI modulators and MIDI CCs can be used to control the parameters in real time. Use the Learn function to quickly map a MIDI CC to a modulation slot.

Whenever you see the modulation slots next to a parameter, touch the Right Arrow button to access the Modulation Parameters screen.

SEE AND TOUCH

Modulation Slots

Parameters that may be modulated have three red boxes along the right side. Boxes with filled with black are empty. red filled boxes are in use. Push the Right Arrow button to configure the modulation sources for these slots.

Target Parameter

While on the Modulation Parameters screen, the name of the element and parameter to be modulated is displayed at the top.

MIDI Learn

With a Source row selected, touch Learn to enable MIDI Learn mode. While enabled, the Learn button is black with a red border. You can now use a MIDI controller to map the corresponding CC to this modulation slot. Once the slot is mapped, the Learn button will turn gray again. Touch the Learn mode or leave the screen to disable Learn mode without mapping a control.

Modulation Settings

Each modulation slot has a Source and Amount row. Turn the bottom knob or use the Learn function to select a modulation source. Set a value for the Amount to adjust the amount of impact the modulation source will have on the value of the parameter.

NOTE:

The numbers in the parameter list will **not** change as the value is modulated.

If you are modulating a parameter that is displayed in a gauge on the dashboard, the gauge will move to reflect the modulated value.

MIDI CONTROLLERS

We hope nanobox will become your MIDI controller's new best friend. You can certainly use nanobox | fireball on it's own to make music, but an external controller gives you more ready access to more features. You can use your MIDI controller to play notes, synchronize with a clock, modulate parameters and control the X and Y modulators. Your nanobox can also pass the MIDI Signal through to another MIDI device.

SET UP MIDI

Fireball will respond to MIDI signals that are received on the MIDI channel specified on the nanobox Config page.

1. Connect your MIDI controller to nanobox directly using a TRS MIDI connection or via the TRS to MIDI 5 Pin DIN adapter included. Nanobox does not support MIDI over USB.

2. From the Dashboard, push the Left Arrow button to access the nanobox Config screen.

3. Set the MIDI In Parameter to the MIDI channel used by your controller. This MIDI channel will be used to play notes, map CCs to modulation slots, synchronize the clock, and control the X and Y Modulators.

4. If you want nanobox to pass the MIDI signal through to another device, simply connect the MIDI out to another MIDI device.

MIDI CLOCK SYNCHRONIZATION

Nanobox | fireball uses a clock to synchronize the LFOs, SEQ and Effects. You can set the tempo internally by selecting a value for the BPM parameter on the Preset Config screen. Push the Right Arrow button from the Dashboard to access this screen. If the fireball receives a clock signal over MIDI or the Clock In, it will follow that signal. The nanobox will follow the first clock available from the following list:

1. Clock In

2. MIDI Clock

3. Internal BPM from the Preset Config screen.

PARAMETER MODULATION VIA MIDI

Once you have set up MIDI via the steps on the previous page, you can use the MIDI controller to modulate parameters. You can use the following standard MIDI signals to modulate a parameter: Velocity, Pressure, Key, and Mod Wheel. You can also use the Learn button to map a MIDI CC to a modulation slot. See "Parameter Modulation" on page 45 above to learn how to apply MIDI to modulation slots.

CONTROL THE X AND Y MODULATORS VIA MIDI

The X and Y modulators controlled on the X/Y Modulator screen on nanobox can be used to modulate any of the parameters that have modulation slots. You can also configure nanobox to allow MIDI control of X and Y.

1.   From the Dashboard, push the Left Arrow button to access the nanobox Config screen.

2.   Choose a CC number for the X Mod and Y Mod parameters. Nanobox will respond to these CC numbers on the channel specified by the MIDI In parameter directly above the X Mod parameter.

SYNCHRONIZING WITH THE CLOCK IN

You can use an analog clock pulse to synchronize nanobox with other gear. Nanobox expects a 4 PPQ pulse.

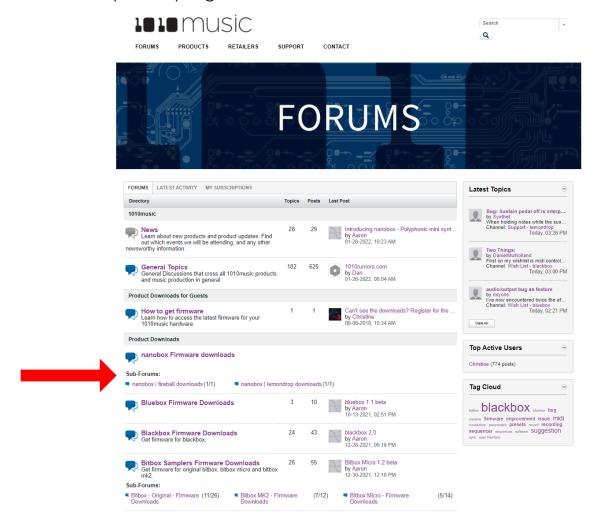The nanobox will follow the first clock available from the following list:

1.   Clock In

2.   MIDI Clock

3.   Internal BPM from the Preset Config screen.

UPDATING FIRMWARE

Check the 1010music forum for the latest firmware release. New releases may contain bug fixes and new features. Updating is easy:

1. Download the NANOFIRE.BIN file from the forum. You must register for the forum (for free) to get access to the downloads area.
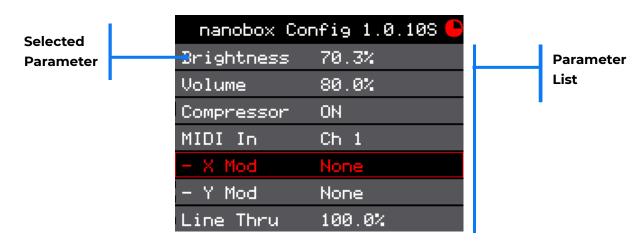

2. Replace the NANOFIRE.BIN file on the microSD card with the downloaded file. Note that the filename must be exactly NANOFIRE.BIN.

3. Replace the microSD card in nanobox and then power the nanobox down and then back up. Nanobox will automatically load the firmware from the microSD card. The current version is displayed on the splash screen and on the nanobox Config screen.

NANOBOX CONFIGURATION

From the Dashboard, push the Left Arrow button to get to the nanobox Config screen.

Use the nanobox Config screen to adjust settings that control the nanobox | fireball for all presets. The settings on this screen are automatically saved every you make a change and will persist when you change presets.

SEE AND TOUCH

Selected Parameter ———

Parameter List

Use the top knob to scroll through the list of values. Keep scrolling past the bottom of the list to access the off screen parameters. Use the bottom knob to change the value of the current parameter.

Parameter	Range
Brightness	The brightness of the touchscreen. 0 to 100%
Volume	The volume of the audio output. 0 to 100%
Compressor	When On, an audio compressor is applied to the line out signal.

Parameter	Range
MIDI In	The MIDI Channel that will be used to control fireball. Signals on other channels will be ignored. Set to Omni to respond to MIDI signals on all channels.
	None, Ch 1 to 16, Omni
- X Mod	The MIDI CC that will be used to control Macro X modulation source. This is the same Macro X that is controlled by the top knob on the Dashboard and by left/right touching on the X/Y Modulation grid.
	"None" and "CC000" through "CC127".
- Y Mod	The MIDI CC that will be used to control Macro Y modulation source. This is the same Macro Y that is controlled by the bottom knob on the Dashboard and by up/down touching on the X/Y Modulation screen.
	"None" and "CC000" through "CC127".
Line Thru	The amount of the signal on the Line Input that is added to the signal sent through to the FX engine.
	0% to 100%
Line Input	When set to Mono, it will only use the signal on the left channel of the line input.
	Stereo and Mono.

TWIST

Top Knob

Select a parameter to edit.

Bottom Knob

Select a value for the currently selected parameter.

PUSH

Home

Go back to the Dashboard.

Layer

Go back to the Dashboard.

Left Arrow

No action.

Right Arrow

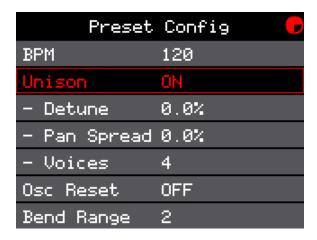Go back to the Dashboard.

PRESET CONFIGURATION

From the Dashboard, push the Right Arrow button to get to the Preset Config screen.

Use the Preset Config screen to adjust settings that control the nanobox | fireball for the current preset. The settings on this screen are only saved when you save the preset.

SEE AND TOUCH

Use the top knob to scroll through the list of values. Keep scrolling past the bottom of the list to access the off screen parameters. Use the bottom knob to change the value of the current parameter.

Parameter	Description	Modulation Target?
BPM	The clock tempo. 40 to 250	No
Unison	When ON, fireball is monophonic, and each note received will trigger the number of voices specified by the Voices parameter. This fattens the sound. When OFF, fireball is polyphonic and triggers one note a time. ON, OFF	No
- Detune	When Unison is ON, this specifies the width of the range of pitches that will be used by the generated notes. Higher numbers add more depth the to sound. 0 to 100%	No
- Pan Spread	When Unison is ON, this controls the breadth of the stereo field of the generated notes. 0 to 100%	No
- Voices	When Unison is ON, this specifies the number of voices generated by each note trigger. Use 1 when you want monophonic mode without doubling. 1 to 8	No
Osc Reset	If On, with each new note, the oscillator will start the wave at 0. If Off, the oscillator will pickup from before. (Does not apply to LFOs.) ON, OFF	No
Bend Range	Number of semitones covered by full spread of MIDI Pitch Bend. 1 to 12	No

TWIST

Top Knob

Select a parameter to edit.

Bottom Knob

Select a value for the currently selected parameter.

PUSH

Home

Go back to the Dashboard.

Layer

Go back to the Dashboard.

Left Arrow

Go back to the Dashboard.

Right Arrow

No action.

EXPERIMENTING WITH WAVETABLES

Now that you've heard what nanobox | fireball can do, let's learn a little more about wavetable synthesis.

CREATE A SANDBOX

Let's start with a safe place to play around.

1. From the Dashboard, touch the name of the preset at the top of the screen to open the preset management screen.

2. Touch File, then Save As to save the current preset as a new preset. Give it a name and then go back to the Dashboard.

FOCUS ON ONE WAVETABLE OSCILLATOR

To focus on one wavetable, adjust the oscillator levels:

1. From the Dashboard, touch the WAV graph to open the oscillator stack.

2. Set the Level for WT1 to 100%.

3. With the Level parameter selected, push the Right Arrow button to open the Modulation Parameters.

4. Set the Source to none for all three modulation slots, then push Left Arrow to go back to the WT1 screen.

5. Push the Layer button to access WT2.

6. Set the Level to 0.0% and clear the source for all modulation slots for the level as we just did for WT1.

7. Do the same for the OSC waveform.

Now, when you play a note, you will only hear WT1 with all of the applied filters and effects. To further isolate the wavetable, let's turn those off.

1. On the Dashboard, touch Filt.

2. On the Filt1 screen, set the Filter parameter to Off.

3. Push Layer to go to Filt2 and do the same.

4. Back on the Dashboard, push the FX button.

5. Set the Depth parameter(s) on FX1 to 0.0.

6. Push Layer to get to FX2.

7. Set the Wet Amount to 0.0 so you we don't hear any reverb or delay.

8. From the Dashboard, push the Layer button to bring up the Grid Keyboard.

9. Touch Hold to enable it, and then tap a note.

Now you are listing to the clean signal generated by the wavetable for WT1.

EXPLORE WAVETABLE POSITION

The focus is on WT1, but the wavetable may be animated if there is modulation applied to the Position parameter. Let's clear that.

1. Go back to the WT1 screen.

2. Select the Position parameter, and then push the Right Arrow button to open the Modulation Parameters screen.

3. Set the Source to none for all three of the modulation slots.

Now you hear a single cycle of the waveform playing. The graph is not moving, the sound is a consistent tone. Save the preset at this point if you want to be able to quickly get back to this state.

Let's see and hear what is in the wavetable for WT1.

1. Change the value of the Position parameter slowly. Depending on which wavetable you are using, it may take a while for the WAV graph and the sound to change.

2. If you want to try a different wavetable, touch the graph on the WT1 screen and then select a different WAV. I recommend Yaiyai.wav in the factory folder for our exploration.

3. Back on the WT1 screen, listen to how the sound changes and watch the graph animate as you move the position through the wavetable one step at a time. To go back to the film analogy, this is like listening to each frame of the film individually.

4. Find an interesting position in the wavetable and move the knob quickly back and forth. You just emulated adding an LFO to the position.

MODULATE POSITION WITH AN LFO AND THE X MODULATOR

Let's put the nanobox to work using an LFO to modulate the position for us.

1. From the Dashboard, touch LFO to configure LFO1.

2. Set the Waveform to Saw, the Rate to around 50%, and the Depth to 100%. The LFO graph changes as you make the adjustments.

3. Clear any loaded modulation slots. When you trigger a note, you will see the LFO gauge on the dashboard move, but you won't hear anything changing. We need to connect the LFO to something.

4. Back on the WT1 screen, open the Modulation Parameters for WT1 Position.

5. Select LFO1 as the source. We still don't hear a change until we set the Amount for that slot to something other than 0.0. Let's set it to 100%.

Now we hear the sound change and see the WT1 graph change as the LFO moves. Try using different shapes for the LFO to hear how they impact the sound. You will not hear the difference in the LFO until you trigger a new note.
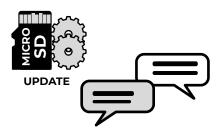
Let's add some performance control to the WT1 Position by assigning the X Modulator to one of the other modulation slots.

1. Open the Modulation Parameters for the WT1 Position parameter.

2. Assign X as the source for one of the open modulation slots and set the amount to 100% for that slot. Since X is controlled by the X/Y Modulator Grid, there is no immediate impact on the sound.

3. Go back to the Dashboard and push Home again to go go the XY Modulation screen.

4. While a note is playing, drag your finger up and down on the XY Modulator grid. Pause at the top of the screen and hear how the LFO continues to modulate in addition to your change to the X Modulator. Touch and hold along the bottom edge of the grid to hear the other end of the range. Tap the grid at various heights on the screen to hear momentary changes to the Position.

Now you have seen how to use a wavetable to generate sound. Experiment with other forms of modulation and add the effects back in. Turn up the level for the waveform oscillator and for wavetable 2 to hear how these oscillators contribute to the sound. Explore and have fun. If you find something you like be sure to save it as a new preset.

FIND OUT MORE

Firmware Updates and Community

Find firmware updates with new features and bug fixes for your nanobox fireball. Scroll down to the Product Downloads header where you will find updating instructions. Connect with other users.

forum.1010music.com

Contact Us

Are you loving your nanobox fireball? Have questions? You can contact us through our website.

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Social Media News

Look for how to videos, new product releases, firmware updates and contests on YouTube, Instagram and Facebook.