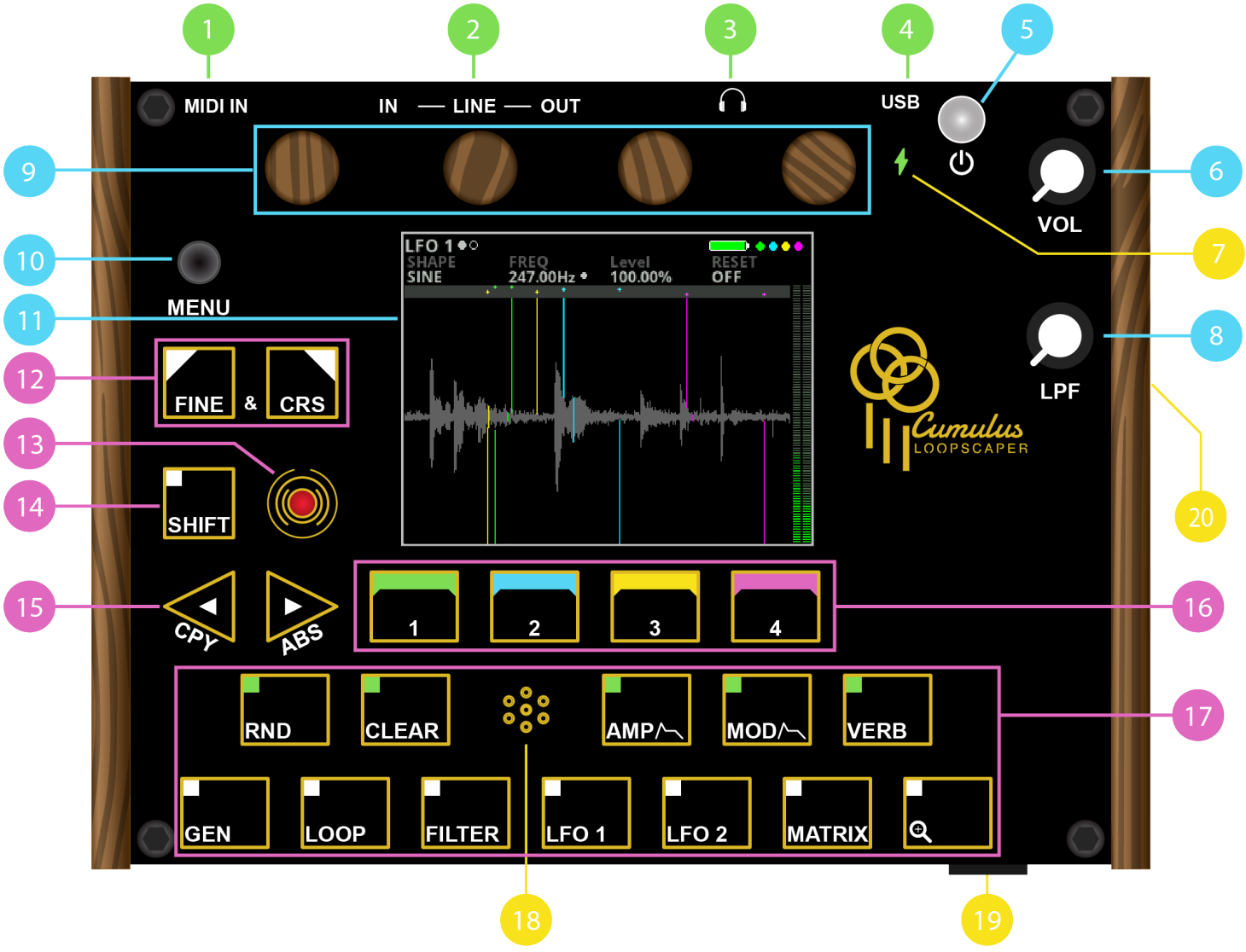
CUMULUS

LOOPSCAPER

Introduction

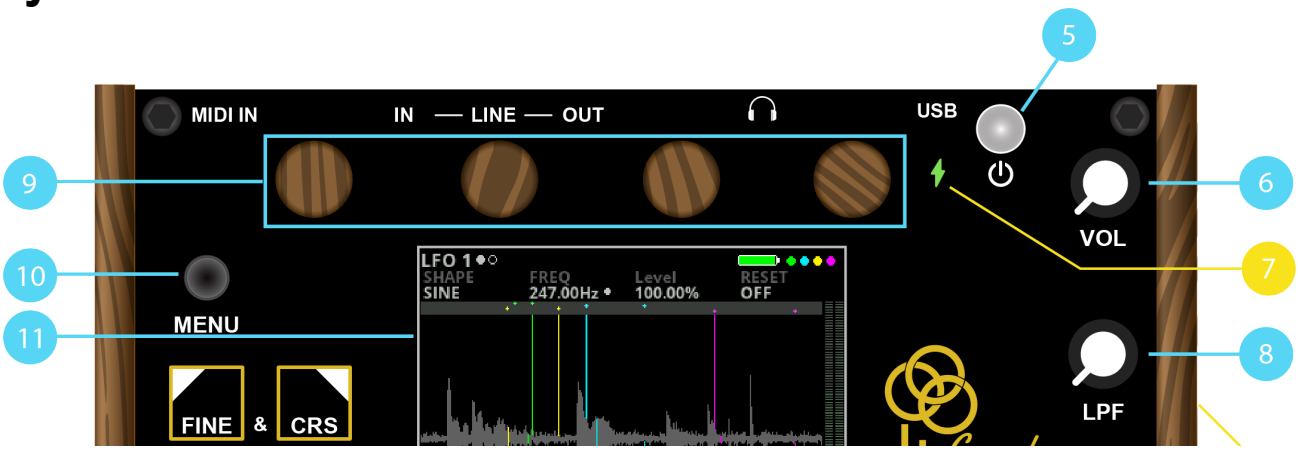
Cumulus is a sample based instrument that offers many ways to manipulate and playback samples. At its core, Cumulus consists of 4 tracks with independent play heads which can be set up to play back one sample in a variety of ways. Cumulus also offers a live mode that can process live audio.



Ins & Outs

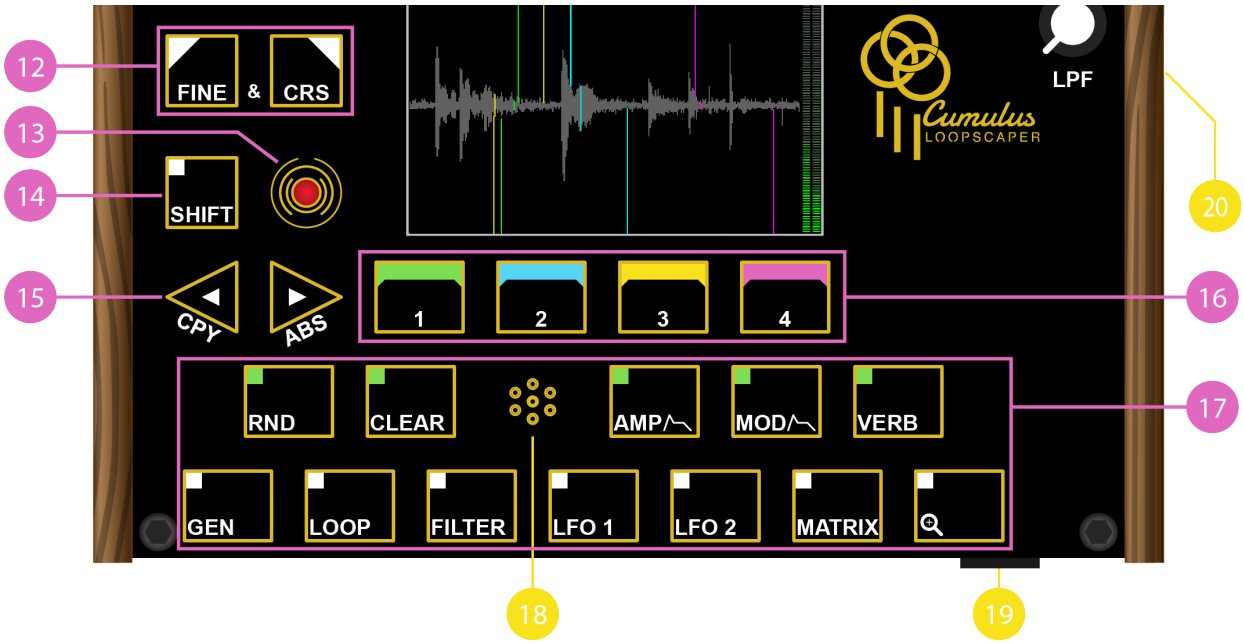
1. 3.5mm TRS-A MIDI input
2. 3.5mm stereo line input and stereo line output
3. Headphone output (see Global Volume)
4. USB-C for Audio input, power, battery charging and MIDI input

Physical Controls



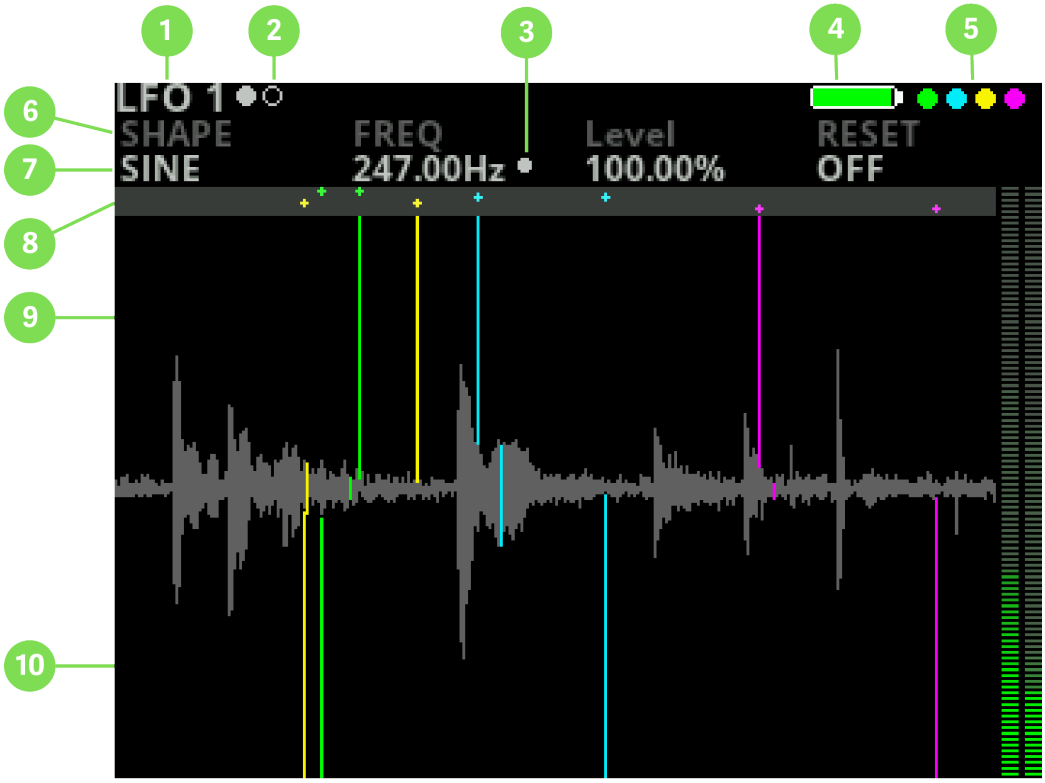
5. Power button
6. Global volume
7. Battery charge LED - Red when charging, Green when fully charged
8. Global filter
9. Encoders, 1-4
10. Menu button
11. Touch screen

Touch Sensors and Other Features



12. Encoder scale modifiers will alter the speed at which encoder values change
    - Hold FINE for finer control
    - Hold CRS for coarse control
    - Hold both FINE and CRS for ultra-fine control
13. Record mode - Press to cycle through record mode and live mode settings. SHIFT + Record mode will toggle Live Mode.
14. SHIFT - Hold down to access different modes and other functions
    - Double tap shift to latch SHIFT on
15. Octave up and down buttons for keyboard. Also used as copy track (CPY) and absolute mode (ABS). Octave up is also used for sample audition.
16. Track play / select buttons.
17. Keyboard - Used to play notes and select modes when SHIFT is held.
18. Microphone
19. Micro SD card slot
20. 18650 Battery (back side)

Screen Layout



1. Mode
2. Page of mode - filled dot is current page, outline dot is second page
    - Some modes only have one page
3. A gray dot next to a value means that parameter is being modulate in the Mod Matrix
4. Battery gauge
5. Selected track(s), any track filled in will be affected by parameter changes
6. Parameter names
7. Parameter values, controlled by encoders 1-4
8. Zoom window - dots represent loop start and end points
9. Loop start point - displays on top of waveform
10. Loop end point - displays beneath waveform
11. Output level meter - red indicates clipping

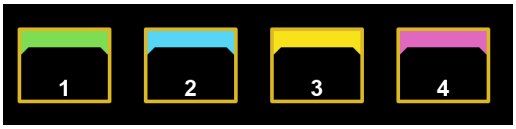
- Basic Operation -

There are many ways to use Cumulus. Let's begin by loading a sample and doing some basic playback.

First, press the menu button to access the first tab of the main menu. In the first tab, all samples from the SD card are listed. Use encoder number 2 to scroll through the samples. Press ABS 

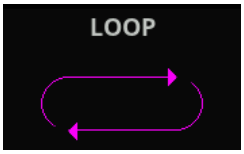
to audition the sample. ABS can also be held while scrolling samples to audition. Press LOAD on the touch screen to load a sample and return to the main screen.

Now that a sample is loaded, it can be played by MIDI, the onboard keyboard or the track play buttons, 1-4.

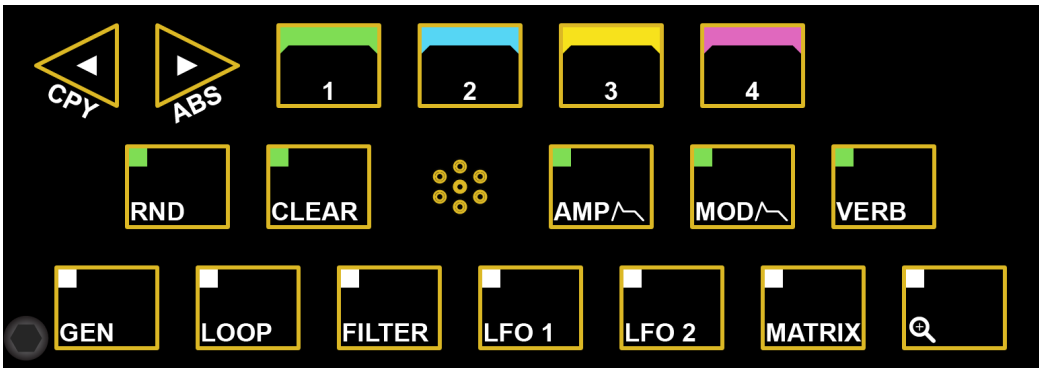


First press one of the track play buttons. This will act as a latching or drone-style playback for the loop. While playing, you will see the playhead for that track move across the sample. The LED for that track will also respond to the amplitude.

Now let's do some basic loop adjustments. Hold SHIFT and press the track you would like to select for editing. More information on track selection can be found on page 8.



Hold SHIFT, press the LOOP mode on the keyboard. Encoder 1 will adjust the start time, and Encoder 2 will adjust the end time. Encoder 3 will do both start and end together. Encoder 4 will adjust the play speed. By default, the loop points are laid out sequentially across the sample with track 1 encompassing the first 25% of the sample. Try changing these settings for all 4 tracks and play them together.

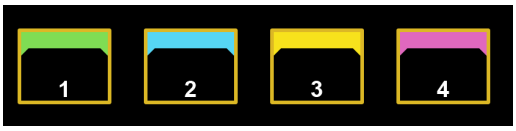


Now let's use the onboard keyboard to play the sample at different pitches. Press the Octave down or up buttons to change the octave. By default, all four tracks will play the sample at the same time (unison). Let's change it to be polyphonic. Hold SHIFT and press the GEN (general) mode twice. If a mode has multiple pages, pressing the same mode more than once will cycle between the two pages. While on page 2 of GEN, use encoder 1 to select POLY as the MIDI MODE. Now when using the onboard keyboard (or external MIDI controller), 4 different notes can be played at once.

Latching Tracks

It is possible to latch the tracks at a specific pitch played from the onboard keyboard or external MIDI controller. Play a note on the keyboard or external MIDI controller. While that note is held, tap the track that is currently playing (1-4). You can now release the keyboard note and the track will continue to sustain. This can be done for all 4 tracks. Tap any latched track to release its voice. Latched voices act just like held notes and will be removed from the pool of available voices.

Track Selection



Track parameters can be edited for a single track or multiple tracks at once. When SHIFT is held, the LEDs for the currently selected track or tracks will illuminate. By default, all tracks are selected for editing.

Select a single track:

Hold SHIFT then tap on one of the track numbers (1-4).

Select all tracks:

Hold SHIFT then double tap on one of the track numbers.

You can also swipe across all tracks to select all.

Select specific tracks:

Hold SHIFT, then hold one of the track numbers.

While both SHIFT and a single track are held, tap other tracks you would like to add to the selection.

Absolute Mode (ABS)

When editing multiple track parameters at once, Cumulus offers two ways parameters change. By default, when a parameter is changed for multiple selected tracks, that values is incremented / decremented relative to the individual tracks value.

Lets say all tracks are selected and their volumes are set at:

100%, 50%, 75%, 150%.

Reducing the VOL parameter by 10 will result in track volumes at:

90%, 40%, 65%, 140%.

ABS mode works differently. ABS mode has a “key” track that the other selected tracks' values will jump to. To enable ABS, hold SHIFT and press the ABS touch sensor. When selecting multiple tracks, the first track selected acts as the “key” track. The key track color will be displayed on the black key LEDs of the keyboard.

In the above example, let’s say we selected all tracks and chose track 1 as the key. Now reducing the VOL parameter by 10 will result in all tracks jumping to 90%.

ABS mode can be handy when creating a polyphonic instrument where you would like all voices to have the same values. You can also copy tracks to achieve the same goal.

Copy (CPY)

To copy one track to another, first hold SHIFT. While keeping SHIFT held, also hold down CPY.

Now select the source track you would like to copy. This track LED will begin to blink. Continue holding SHIFT and CPY and tap the destination track. This will paste all parameters from the source track to the destination.

Global Volume

The VOL knob controls the main output volume of both the line and headphone output. Hold FINE to only adjust headphone. Note headphone volume is relative to main volume level.

Global Filter

Cumulus has a global filter that affects all tracks and comes just before the reverb in the signal chain. The Global Filter potentiometer sets the frequency of the filter. The global filter also has 3 filter types, low-pass, band-pass and high-pass.

To change filter type:

1. Hold the FINE encoder scale modifier
2. Turn the global filter potentiometer
    1. Fully counterclockwise sets low-pass
    2. Center position sets band-pass
    3. Fully clockwise sets high-pass

To adjust resonance:

1. Hold the CRS encoder scale modifier
2. Turn the global filter potentiometer
    1. Fully counterclockwise sets no resonance
    2. Fully clockwise sets full resonance

The global filter will not self-oscillate like the individual track filters. Resonance and filter type is saved with presets.

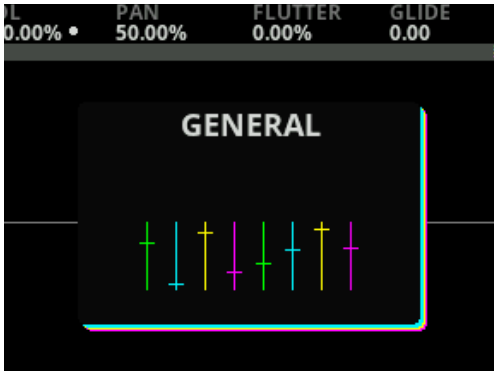
- Modes -

Hold SHIFT and press a key on the keyboard enter the desired mode. Some modes have a second page  which is accessed by pressing the same mode a second time.

Mode: GEN (General) 

VOL

Changes volume of track. Track volumes go up to 2000% gain to account for very quiet samples. If digital clipping occurs on a track, its LED will temporarily turn red.



PAN

Stereo panning. 50% represents center.

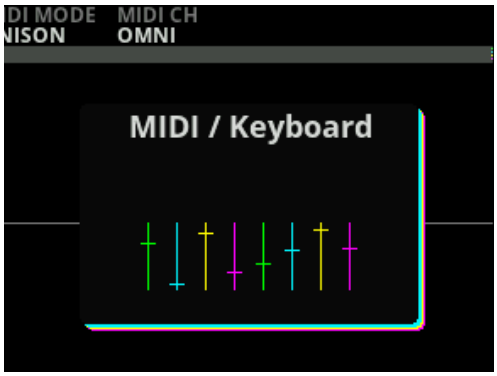
FLUTTER

Emulates random fluctuations in old cassette tapes.

GLIDE

Glide amount.

MIDI or Keyboard settings apply to all voices.



MIDI MODE

UNISON plays all tracks together. POLY treats all tracks as voices in a polyphonic synth. MPE acts like POLY, but also accepts polyphonic aftertouch and slide (CC#74).

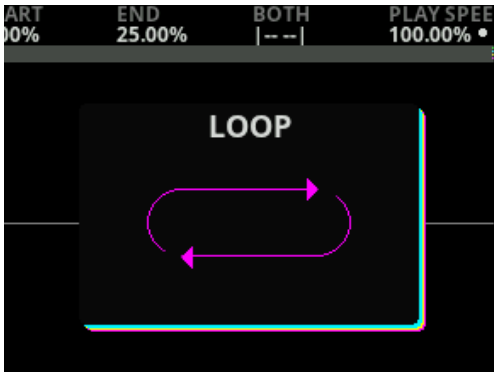
POLYCH treats each track as a separate MIDI channel.

MIDI CH

If MPE mode is on, MIDI CH will always be set to OMNI and use all MIDI channels.

POLYCH uses 4 MIDI channels, with MIDI START indicating the starting channel.

Mode: LOOP



START

Adjusts start point of a track loop.

END

Adjusts end point of a track loop.

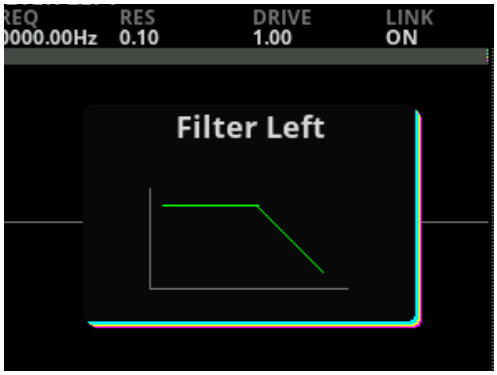
BOTH

Adjusts both start and end of loop together.

PLAY SPEED

Speed at which loop will play. Speed will act as an offset if pitch information is received from the keyboard or external MIDI controller. Play speed is limited to 8X.

Mode: FILTER



Each track has stereo low pass resonant filters. Page 1 of filter mode is the left filter, page 2 is the right.

Filter oscillation will track with the keyboard or MIDI controller if frequency is set to 0.

FREQ

Filter frequency in Hz

RES

Resonance. Filter will self-oscillate if resonance is over 1.0

DRIVE

Gain added to the waveform as it enters the filter.

LINK

If link is on, adjusting settings for one filter will also change the others relative to its own value.

Mode: LFO 1 and LFO 2

Each track has 2 LFOs. Both LFO 1 and 2 have identical settings.

SHAPE

Waveform shape. Sine, Triangle, Saw, Square or Random.

FREQ

Frequency of LFO in Hz.

AMP

Amplitude of LFO.

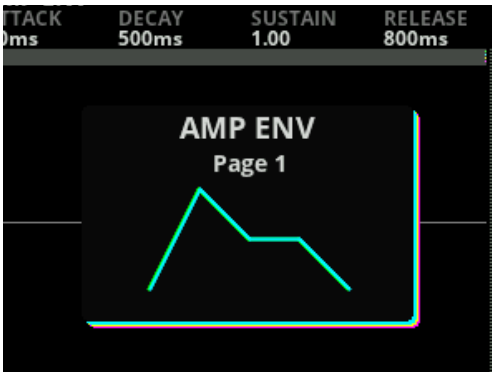
RESET

Resets LFO to start of it's cycle on keypress on keyboard or external MIDI controller.

MIDI SYNC

Syncs LFO speed to external MIDI clock. If MIDI sync is on, FREQ will be displayed as division or multiplication of clock.

Mode: AMP ENV and MOD ENV



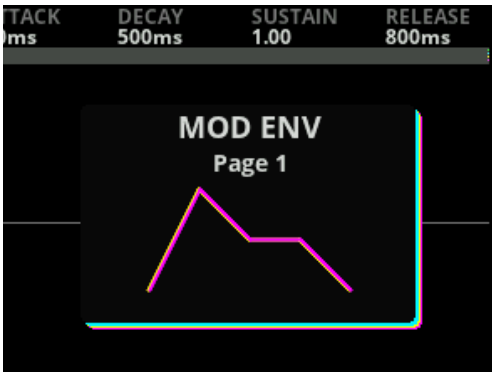
Each track has two 6 stage envelopes. Both AMP and MOD envelopes have identical settings. By default, AMP envelope is routed to amp, but this can be changed in the mod matrix. AMP envelope determines when a track will stop playing a sample, even if it is not routed to amplitude.

ATTACK

Envelope attack time in milliseconds.

DECAY

Envelope decay time in milliseconds.



SUSTAIN

Envelope sustain level.

RELEASE

Envelope release time in milliseconds.

DELAY

Delay time in milliseconds. Delay stage comes before attack.

HOLD

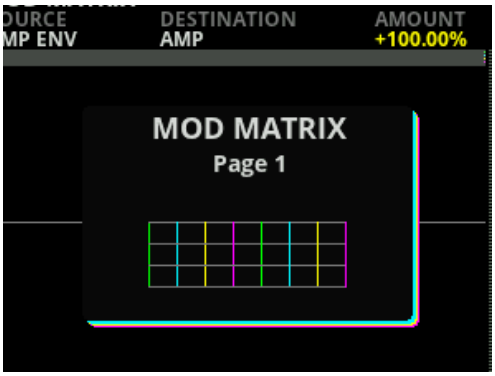
Hold time set in milliseconds. Hold stage is after attack.

ENV LP

Set envelope to loop. Loop starts at delay stage and ends at sustain. Set sustain level to 0 to hear looping.

Mode: MATRIX

Cumulus offers a very large modulation matrix per track. All sources can modulate all destinations at the same time. Use encoder 1 to select the source of the modulation. Select the destination with encoder 2 and set the amount with encoder 3. Amount can be positive or negative. Negative amounts will invert the source. Positive modulation is displayed in yellow and negative is displayed in teal.



SOURCE

Internal sources:

- AMP ENV
- MOD ENV
- LFO 1
- LFO 2

MIDI sources:

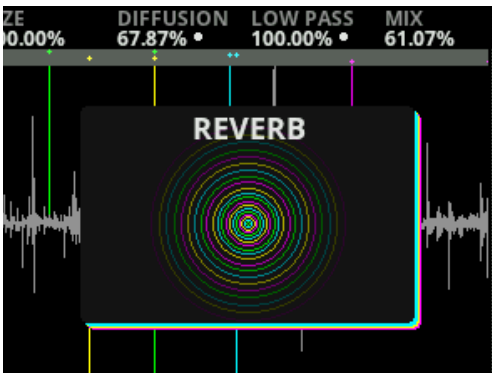
- VELOCITY
- AFTERTOUCH (MPE capable)
- CC#74 (MPE capable)
- KEYTRACKING (onboard keyboard included)

DESTINATION

31 modulation destinations are available. The last 5 destinations are the global filter and global reverb parameters. All other destinations only apply to the current track (or tracks) being edited. START and END can be modulated together by holding SHIFT.

The second page of Matrix mode lists all modulation. If modulation for a single track exceeds 12 parameters, encoder 1 can be used to scroll.

Mode: VERB (Reverb)



Reverb is not a per-track effect. Reverb is at the end of the audio chain and all tracks feed into it.

SIZE

Size of reverb.

DIFFUSION

Lower settings will create more of an echo.

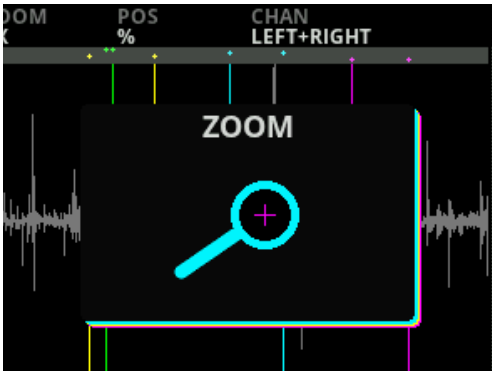
LOW PASS

Low pass filter on reverb. Lower settings create a darker reverb.

MIX

Wet / dry mix.

Mode: ZOOM



Zoom is a utility control for moving around the waveform and zooming in on specific regions. This can be helpful when you need loop start or end points to be more precise. When zooming in, the small zoom window will show which section of the sample you are in.

ZOOM

Set the zoom amount.

POS

Set the position of the zoom window.

CHAN

Display left, right, or both left and right channels of audio file.

Mode: RND (Randomize)

Randomize allows you to set random values for all parameters in a single mode or for an entire track. Not all parameters are included when randomizing. Pitch and loop points can also be included or excluded.

Hold SHIFT and RND to access randomization mode. Continue holding SHIFT and RND and press either a track or a mode.

AMOUNT
Set the amount of randomization.

INC PITCH (Include Pitch)
A toggle to include or exclude pitch data for the track. This also applies to the modulation matrix.

INC LOOP (Include Loop)
A toggle to include or exclude loop start/end data for the track. This also applies to the mod matrix.

These are always excluded from randomization:

- **GEN** - VOL, all MIDI settings
- **FILTER** - LINK
- **LFO 1, LFO 2** - MIDI SYNC

Mode: CLEAR

Clear will reset all parameters for a single mode or entire track. Hold SHIFT then press and hold CLEAR. While both are held, press a track to clear a track or a mode to clear a mode. Clearing reverb will also clear any modulation of reverb parameters.

Recording

Cumulus offers a variety of inputs to record from. To enter record mode, press record mode. Page one of record mode is for recording samples, page two is for live mode.

INPUT

Select the input to record from. Options are Line, Mic, USB and Resample. To record from USB ensure your computer has Cumulus set as the audio interface for output. Resample will record the output of Cumulus before the reverb and global filter stage.

REC THRESH

Set the threshold for starting a recording. If threshold is not set to off, REC ARMED will be shown after pressing START REC. Cumulus will then wait until the incoming audio exceeds the threshold value before starting a recording.

MIC GAIN

The onboard microphone on Cumulus has its own preamp. Set the gain here.

MONITOR

If you would like to monitor the incoming signal, set the level here. Feedback might occur if monitoring the MIC input with Cumulus connected to speakers.

When you have selected the input and set your levels press the START REC button on the touch screen to begin a recording. Press the STOP REC button on the touch screen to stop. You can also press the Record mode touch sensor to stop the recording. If not manually stopped, a recording will automatically stop after 45 seconds as this is the maximum recording length. New recordings are saved with the name RECORDING.

Live

Cumulus can act like a live effect pedal. Press the record mode sensor a second time to enter LIVE mode setup. Live mode uses incoming audio in place of a sample. This incoming audio is updated based on the buffer time.

BUFFER

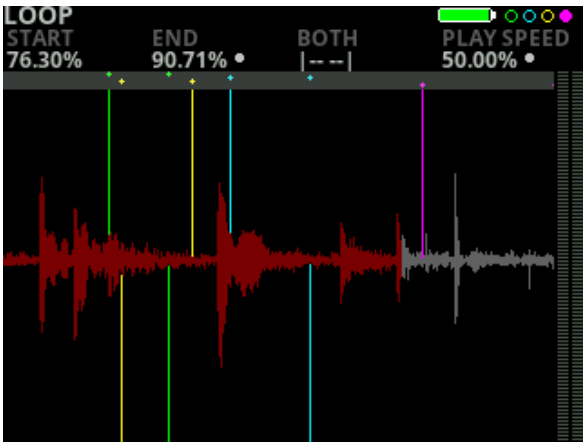
This is the size in seconds of the live buffer. Buffer size can also be synced to divisions or multiplications of incoming MIDI clock. To access MIDI clock options scroll past 14 sec.

FEEDBACK

Sends the current playing audio into the currently recording buffer.

After setting buffer size and feedback amount, press the START LIVE button on the touch screen to start live mode. Press STOP LIVE to end live mode.

Live mode can be quickly toggled on and off by holding SHIFT and pressing the record sensor.

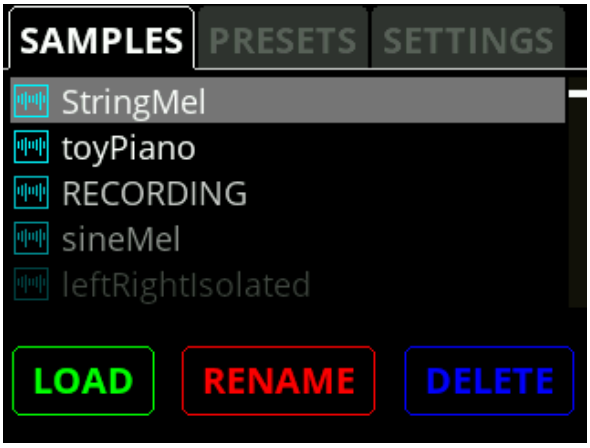


While live mode is active, the waveform display will be constantly updated with incoming audio. The red color indicates the position of the current buffer recording. When it reaches the end of the screen, a new buffer will immediately start. This continues until live mode is ended.

When ending live mode, the current buffer will remain until a new recording or live mode is initiated.

Menu

The menu is for saving and loading samples and presets. The menu also allows you to set the LED Brightness and Touch threshold.



Encoder 1

Selects between 3 tabs, SAMPLES, PRESETS and SETTINGS. These tabs can also be selected by touching them on the touch screen.

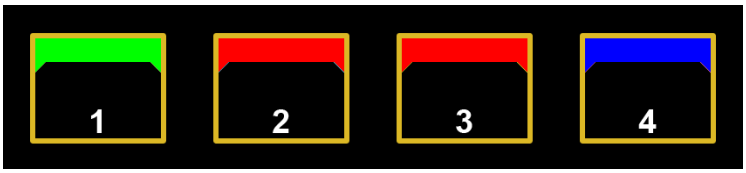
Encoder 2

Scrolls the available samples, presets or options in the settings tab.

Encoder 3

Only active on the SETTINGS tab. It will set the values of LED brightness or Touch Threshold.

Menu Buttons



In addition to the buttons at the bottom of the screen, Track Buttons 1–4 light up to mirror the on-screen controls. Pressing a track button has the same effect as tapping its on-screen counterpart.

Samples

The samples tab will list all the samples on the SD card. You can load, rename or delete samples here using the 3 buttons at the bottom of the touch screen or Track buttons 1-4. The current loaded sample will appear in bold and yellow.

LOAD

Use encoder two to select a sample. The ABS button will be illuminated green while on the sample tab. Press ABS to audition the sample. ABS can also be held while scrolling through samples. Press the load button at the bottom of the touch screen. If the sample loads successfully the menu screen will exit. If a sample has an incorrect format, it will not load and an error will display the issue with the sample.

RENAME

Use encoder two to select a sample. Press the rename button at the bottom of the touch screen. The name will automatically populate.Use encoder 1 to select the character position. Use encoder 2 to select the character or number. Press the YES button on the bottom of the touch screen to rename or NO to cancel. Be aware that presets contain a reference to a sample they are saved with. If you rename a sample that is used in a preset, that preset will no longer be able to find the sample. You can manually load the renamed sample and resave the preset to fix this.

If a sample name is longer than 19 characters you will not be able to rename it on the device. It will need to be changed on the SD card from a computer.

DELETE

To delete a sample, use encoder 2 to select it then press the delete button on the touch screen. A confirmation dialog will appear. Press Yes to delete or No to cancel.

Presets

The presets tab will list all the presets on the SD card. You can load, save or delete presets here using the 3 buttons at the bottom of the touch screen or Track buttons 1-4. The current loaded preset will display bold and yellow.

LOAD

To load a preset, use encoder 2 to select it then press the load button. This will exit the menu with the new preset loaded. Hold ABS to load a preset without changing the current sample.

SAVE

To save a preset, use encoder 2 to select it then press the save button on the touch screen. The name will automatically populate based on the last selected (**not loaded**) preset name. Be aware of the name you choose as it will overwrite a preset with the same name.

Use encoder 1 to select the character position. Use encoder 2 to select the character or number. Press the YES button on the bottom of the touch screen to save or NO to cancel.

As noted above, presets contain a reference to a sample. If you save a new preset with a new recording (sample name: RECORDING), the sample will automatically be renamed to the preset name you choose.

DELETE

To delete a preset, use encoder 2 to select it then press the delete button on the touch screen. A confirmation dialog will appear. Press Yes to delete or No to cancel.

Settings

Settings are global and saved on the device. Settings will persist through power cycles.

Use encoder 2 to select a setting.
Use encoder 3 to adjust the setting.

LED Brightness - the brightness of the touch sensor LEDs.

Touch Sensor Thresh - the sensitivity of all the touch sensors. Set this lower if Cumulus is not detecting touch.

Record Toggle MIDI CC - MIDI CC to toggle record - any non-zero value will start recording, 0 will stop recording.

Live Toggle MIDI CC - MIDI CC to toggle live mode - any non-zero value will start live mode, 0 will turn off live mode.

Mode popup - toggle the popup graphics that display when changing modes.

Parameter Popup - toggle the parameter change pop-up that displays when changing parameters. Loop start and end points will never show popups for value changes.

SD Card

The micro SD card needs to be inserted at all times during operation. The SD card has two folders: presets and samples. This folder structure is required for Cumulus to operate.

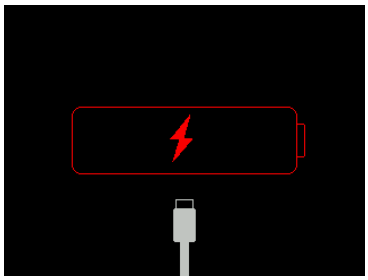
Samples need to be the correct format for Cumulus to read them. The sample format is 44.1kHz, 16-bit. Samples can be mono or stereo. Any length sample can be loaded, but it will be truncated at the 7.8MB mark. Generally this equates to about 44 seconds for a stereo sample. If Cumulus cannot load a sample, an error message will display stating the issue.

Presets are files that contain all parameters for a patch. The very first line in the text file will be the sample used in the preset. Although it is not recommended, it's possible to edit this first line if you would like the preset to use a different sample. If you choose to do so, ensure the full name of the sample with the .wav extension is included. This can also easily be done on the device by loading a new sample and re-saving the preset.

Battery

Cumulus does not come with a battery. Cumulus uses a single flat top 18650 battery. Battery life will depend on the milliamp hours (mAh) of the battery used. A 3.7V 2,500mAh battery will provide about 8.5 hours of use. Larger mAh batteries will last longer. Cumulus consumes about 240 mA of power.

Warning: Inserting the battery in the wrong orientation can damage Cumulus.

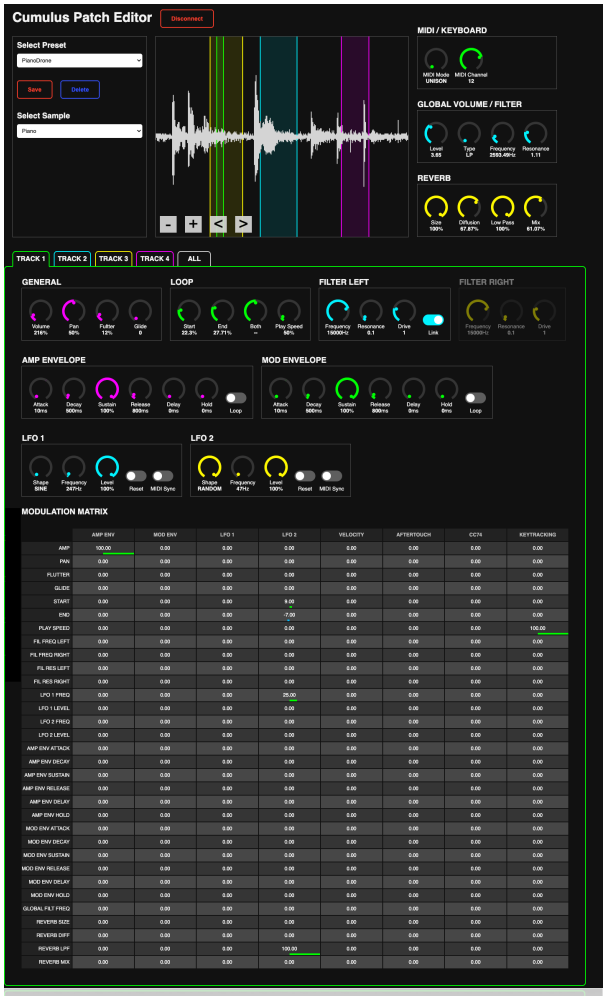


Low Battery and Auto-save

If the battery is below 10% the battery icon will turn red. If the battery drops below 3.5V, Cumulus will initiate an auto-save. A preset will be saved with a name like “Temp - ####”. Cumulus will display this dead battery screen if the battery level is below 3.5V.

Cumulus can charge the battery while in operation, but be aware, a ground loop can occur if usb connection uses the same ground as the audio output. This will result in a noisy audio signal. The charging LED will illuminate in green if fully charged (or operating solely on USB power) and red when charging.

Patch Editor



A full patch editor can be found at:
https://rainydayei.com/cumulus-patch-editor/

Google Chrome is the required browser. This editor will not work on iPads or iPhones as Apple restricts Web MIDI on those devices.

When the editor is connected to Cumulus, the encoders and potentiometers will be disabled. Presets can be saved, renamed and deleted. Samples can also be selected but not edited.

The waveform can be navigated with the buttons at the bottom of the window.
Global controls are at the top of the editor and tracks can be selected with the tabs below. Tracks can be edited one by one or all at once when inside the ALL tab. The ALL tab is like using ABS mode on the device, all tracks will jump to the values set.

Knobs are controlled by clicking and dragging vertically. Hold Shift on the keyboard for finer control. The mouse wheel can also be used to change values when hovering over a knob. Double-clicking a knob will return it to its default value.

The modulation matrix values are set by clicking and dragging left and right for positive and negative values. Double-click a value to edit using the keyboard.

Support

Please contact toby@rainydayei.com for support. Thank you for purchasing Cumulus!