



## USER GUIDE

V 2.1

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Manufacturer: OXI Instruments

#### **Specifications Subject to Change:**

The information contained in this manual is believed to be correct at the time of printing. However, OXI Instruments reserves the right to change or modify any of the specifications without notice or obligation to update the hardware that has been purchased.

# WELCOME

## Thank you for purchasing OXI Coral.

The introduction of the Mutable Instruments Plaits module was a revolution in terms of compact, multi-engine synth voice modules. Thanks to MI's open source contributions, we have taken some of their algorithms and put them into a compact package that contains 8 "instances" of the module. We've added some new ingredients like independent envelopes and a filter per voice, FX, full MIDI implementation and a colorful organic interface. On top of that you have custom wavetables and a sample playback engine available per voice.

But we didn't want to create just another polyphonic synth. So, to allow you to make the most out of every voice, we've introduced the multipart concept. This means you can arrange and use the 8 voices as you want: 8 monophonic parts, 1 polyphonic part of 8 voices, or any combination of those. Flexible setups like 2 polyphonic parts of 3 voices each plus 2 monophonic voices in the same module are possible.

This makes the CORAL a versatile and powerful Polysynth, Drum Machine, Groovebox and Sound Exploration module at the same time!

We won't stop here and we'll add more engines in the future with firmware updates as we have been doing with the OXI ONE!

— OXI team

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# SPECIFICATIONS

## Dimensions

14 Hp  
3 cm deep

## Panel

Black anodized aluminum with color silkprint.

## Consumption

+12V - 110 mA  
-12V - 10 mA  
+5V - 0 mA

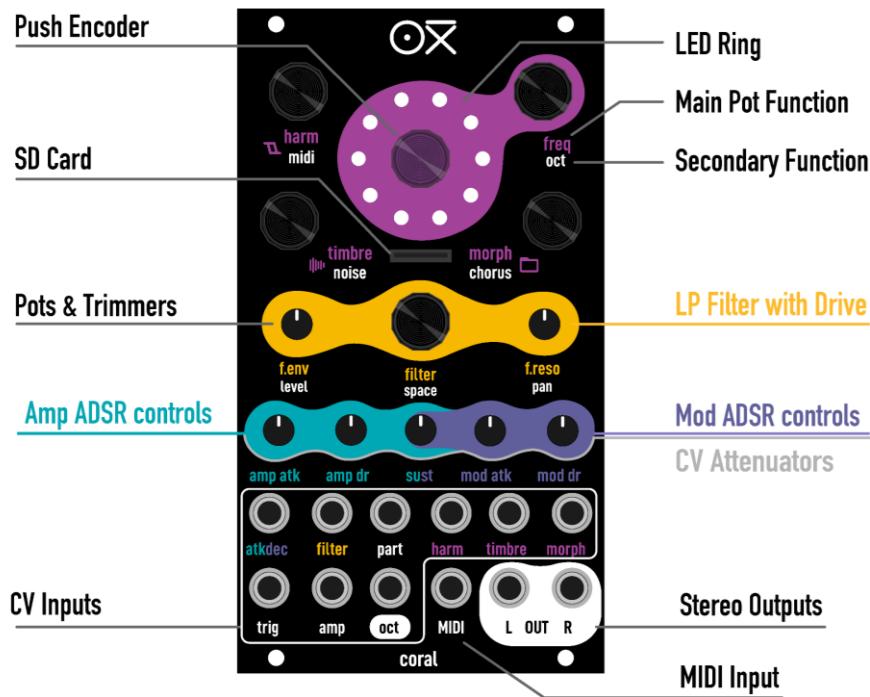
## Outputs

2x Mono DC coupled outputs ( $\pm 5$  V)

## Inputs

1x MIDI TRS (Type A and B compatible).  
8x CV inputs  $\pm 5$  V ( $\pm 10$ V max).  
1x Gate input

# PANEL OVERVIEW



## Encoder with push button:

- **Engine** selection
- Push & Hold for Voice/Part selection
- Push & Hold + Knob turn to change secondary parameter
- Tap to toggle between **Load**, **Save**, **CV Assign** and **Main** views.

## Micro SD card socket:

- A Micro SD card with factory content Must be always inserted.
- A fast SD card (class 10 or higher) is required to use the wav player intensively.

## CV Inputs:

- CV inputs affect the selected part (all voices by default)
- Part can be addressed with Part CV or in the CV Assign screen.
- The ADSR envelope trimmers work as bipolar CV attenuators in their secondary function.

## LEDs Ring:

- Provides visual feedback of the different screens of the module.
- By default each LED represents the amplifier value of each voice.

# INTRODUCTION

CORAL is a polyphonic multipart synthesizer.

It is **polyphonic** because it can play up to 8 different voices or notes at once.

And it is **multipart** because each of the 8 available voices can be set to a different engine, midi channel and have a different set of values for each parameter (filter, sound controls, envelopes, effect sends, etc.).

The most straightforward way to play the Coral is like an 8 voice polyphonic MIDI synth or like a single voice via CV listening to channel 1. This is how the module works when you turn it on for the first time. You should start here to understand the basic concepts.

You can also try to patch a pair of Gate CV/Oct signals to trigger the internal envelopes and hear how Coral sounds.

## POLYPHONIC SYNTH

Like in any polyphonic synth, Coral has multiple voices ( 8 more specifically ) that are able to play different notes.

In general, when a poly synth receives a new note, it assigns one of its voices to play it. One voice may be composed of one or more oscillators, a VCA, envelope, filter, etc.

To use CORAL like a poly synth the easiest way to start is by using the MIDI input. By default, all the voices listen to MIDI channel 1. Every new note will be assigned a new voice. If more than 8 notes are held together, the least recent note will be “stolen” (LRU strategy).

The AMP value of the active voices will be represented in the LED Ring.

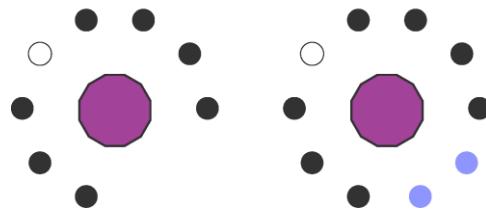
## MIDI CHANNEL

From this point, to change the MIDI channel (of all voices), simply keep the Push Encoder Knob (center pink knob) pressed and turn the **harm** knob, whose secondary parameter is effectively **midi** channel.

The 16 available MIDI channels will be shown in 2 pages of 8 channels. The second page is indicated with two delimiter points.

**1 - 8**

**9 - 16**



## PRIMARY AND SECONDARY PARAMETERS

Each knob controls one **main parameter** and one secondary parameter. Using this strategy has allowed us to pack a lot of functionality in a smaller footprint.

To modify a **secondary parameter**, push and hold the encoder and turn the corresponding knob.

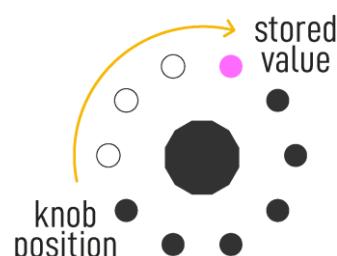
The knob position and the parameter value may not match, so in order to avoid sudden changes of the value of the parameter, you have to first “catch up” the stored value. This applies both to the main and the secondary parameters.

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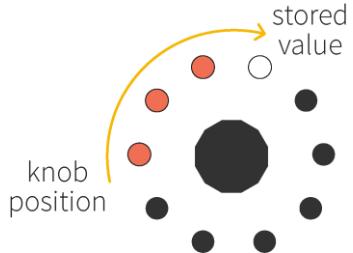
*You need to get familiar with “catching up” knob values to move between main and secondary parameters with ease.*

---

For the primary parameters, the stored value is represented in the color of the parameter section while the current position of the knob is shown in white:



For the secondary parameters, their stored value is shown in white color meanwhile the current position of the knob is indicated in orange:




---

*When the module starts up, you may need to catch up the main or secondary values since the position of the knob and the stored parameter values may not match.*

---

## VOICE ALLOCATION

How do I know which note is played by which voice?

Every time Coral receives a new MIDI note, it assigns it whatever voice is free or steals one if necessary.

If you want to access an exact voice with a certain synth-engine **using MIDI**, you need to assign a certain midi-channel, and therefore create a part (more about this later).

On the contrary, the Trigger patch input triggers all the voices of the selected part. More on this later.

## MULTIPART BOX

### PARTS CONCEPT

The 8 available voices in Coral can be grouped into parts. The strategy is that voices set to the same MIDI channel belong to one part.

By default all voices are assigned to MIDI channel 1. This means that there is only one part. As soon as you assign one voice to a different MIDI channel, a new part will be created.

Each part can be addressed via its MIDI channel or with the Part CV input. The former is very obvious, the latter will be explained in the CV section.

To reset voices to default state (1 part), hold the encoder for at least 5 seconds until you see the LED animation in red.

# GETTING TO KNOW MULTIPART

Coral is meant to offer flexibility. Being able to decide how many voices you want for your Lead or your Chords is fantastic and that mixed with the vast sonic palette of the module makes it a really powerful tool.

But flexibility comes at a price.

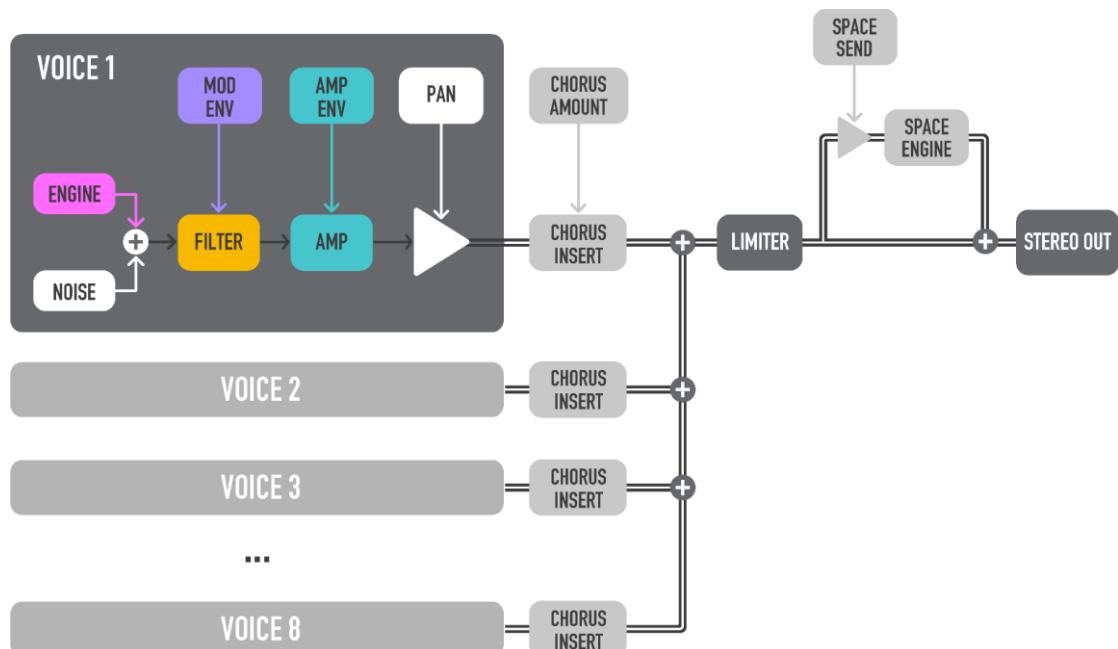
We recommend in the beginning that you start playing with one single part. Once you get comfortable using the module, create more parts.

Start simple, create two parts and get used to switching from one part to another and playing with the parameters of each one.

For example, you can create one part with one voice for a bassline and another part with the remaining voices for chords or any other polyphonic use.

In order to create parts, we need to learn first how to navigate between voices and parts. We will see how in the following chapters.

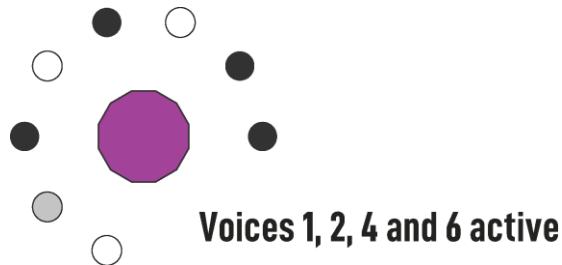
# SIGNAL FLOW



# INTERFACE

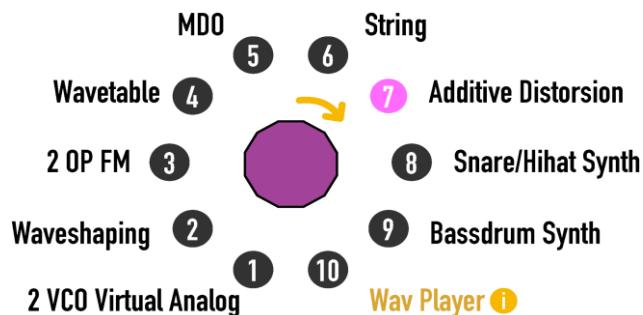
## MAIN VIEW - Voice Status

In the main view, the AMP value of the active voices will be represented in the LED Ring.



## ENGINE SELECTION

Turn the encoder to change the engine of the selected Voice or Part. The new engine will be automatically applied.



The active engine of the selected part is shown in Pink as in the diagram.

# PRIMARY CONTROLS

Either primary or secondary controls will affect the selected Voice or the voices in the selected Part only!

## harm

Controls the first parameter of the selected engine. In the case of the Wav Player, it acts as an overdrive control.

## oct

Sets the base octave of the sound. It acts as an offset of the input MIDI note or CV pitch (oct) input.

## timbre

Second parameter of the engine. In the case of the Wav Player, it is the sample selection.

## morph

Third parameter of the engine. In the case of the Wav Player, it is the sample folder selection.

## f.env

Sets the amount of the MODulation ADSR envelope applied to the filter frequency.

- At 12 o'clock it's 0%.
  - Fully Clockwise is 100% and
  - Fully counter clockwise is -100%.
- 

*The MODulation ADSR envelope is by default linked to the filter cutoff.*

*But the MOD controls can also have an impact on the sound depending on the selected engine.*

---

## filter

Sets the frequency of the low pass filter.

## f.reso

Set the resonance and drive control of the filter.

## amp atk

Sets the attack time of the amplifier ADSR envelope.

## amp dr

Sets the time of the Decay and Release stages of the amplifier ADSR envelope.

## sust

Sets the sustain level of the amplifier and the modulation ADSR envelopes.

## mod atk

Sets the attack time of the modulation ADSR envelope.

## mod dr

Sets the time of the Decay and release stages of the modulation ADSR envelope.

# SECONDARY CONTROLS

## midi

Selects the MIDI channel.

## freq

Fine control of the base frequency.

- At 12 o'clock there is no detuning.
- Fully Clockwise is 100% and
- Fully counter clockwise is -100%.

## noise

Controls the level of the **white noise** internal source. This level is not affected by the voice level so you can have an independent noise source.

If the **Delay** effect is enabled in settings (options.txt file), this control sets the delay send amount. The delay send amount can be independent per voice.

## chorus

Sets the send amount to the **Chorus** FX engine.

If the **High Pass Filter** is enabled in settings (options.txt file), this control sets the frequency of the filter instead. There's an independent HP Filter per voice.

## level

Sets the maximum amplitude level.

## space

Sets the send amount to the Space FX engine.

## pan

Sets the stereo pan following a constant power pan law.

## cv attenuators

The envelope trimmers' secondary functions are bipolar attenuators for the CV inputs that are just below them.

**amp atk:** affects the **atkdec** CV

**amp dec:** affects the **filter** CV

**sust:** affects the **harm** CV

**mod atk:** affects the **timbre** CV

**mod dec:** affects the **morph** CV

# PART / VOICE SELECTION

**VOICES** with the same MIDI channel assigned are grouped into **PARTS**.

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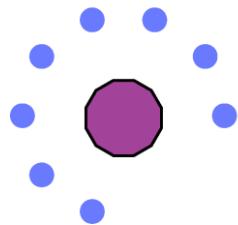
You can have your 8 voices divided in different parts, for example 1 part of one voice for your bass, another part with 3 voices for a lead and the remaining 4 voices in another part for the chords.

---

To navigate through the different voices and parts, push, hold and turn the Encoder.

1. When the module is in its default state (after first startup or after a reset), if you hold the encoder for half a second, the LED ring will look as follows.

All **VOICES** selected



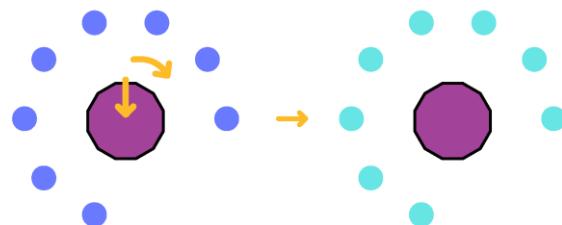
This means all the voices are selected, from 1 to 8. Any change in the controls, potentiometers or encoder will be applied to all voices.

2. Release the encoder to go back to the main view, the voice AMP visualization.

3. Push and hold the encoder again and then turn it clockwise 1 tick.

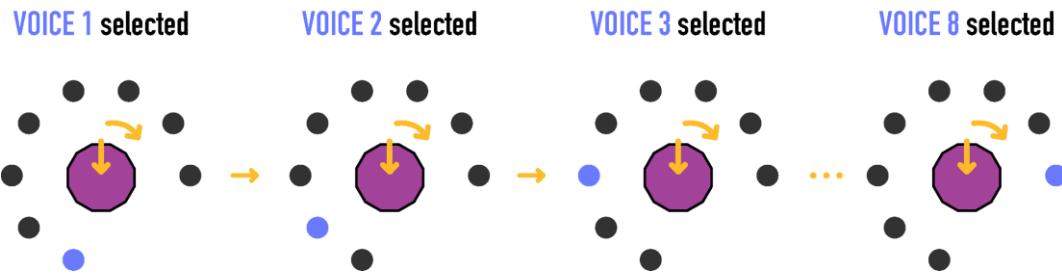
You will see that the LEDs go from “**All VOICES**” selection to **PART** selection.

All **VOICES** selected      PART 1 selected



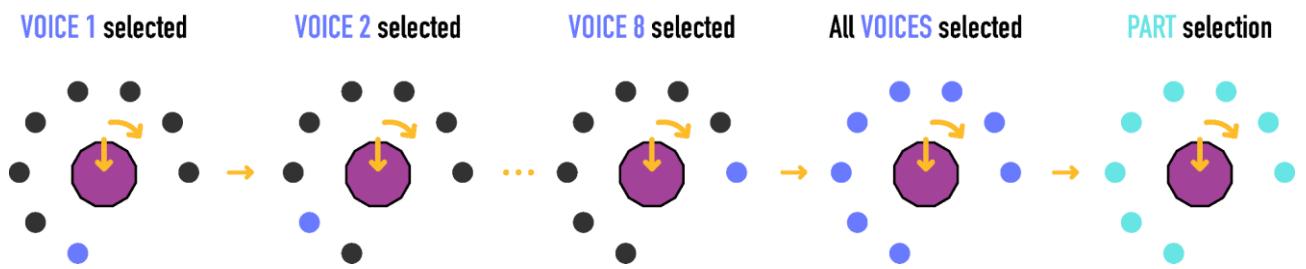
Since by default there's only one part, all the LEDs will light up in the same turquoise color.

4. Push and hold the encoder and turn it clockwise 1 extra tick to navigate to voice 1, 2, etc until reaching the last 8th voice.

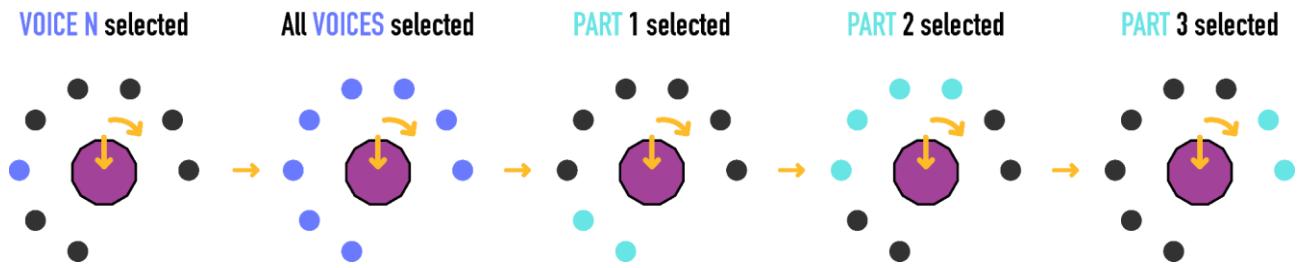


5. Once the 8th voice has been reached, another encoder tick clockwise and the selection goes back to **All VOICES** and then to **PART** selection.

Note: Voice N means N voice from 1 to 8



6. As soon as there is more than one part available, the **PART** selection will navigate through the different parts. In case we had 3 parts, it could look as follows.




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*Turning the encoder Counterclockwise allows you to navigate in the opposite direction.*

---

## PART CREATION

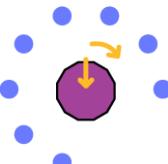
To illustrate this process, we will use the following example. Let's create three different parts for the following instruments:

- 1st voice: mono Bassline. MIDI channel 1 ( part 1 )
- 2nd voice: mono Lead. MIDI channel 2 ( part 2 )
- 3 to 8th voices: 6 voices for chords, pads or any other polyphonic usage. MIDI channel 3 ( part 3 )

For simplicity and to avoid changing the MIDI channel of all the voices one by one, let's change the MIDI channel of all the voices to channel 3. To do so, press and hold the encoder.

The LED ring should look like this, showing that all the voices are selected. If that's not the case, hold and turn the encoder until the 8 first LEDs are lit in a blueish color.

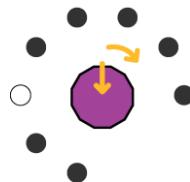
All VOICES selected



Then turn the harm/midi encoder to adjust the secondary parameter, which is effectively the MIDI channel.

You may need to catch up to the previous value. Take control of the MIDI parameter and turn the knob until the LED ring looks like this:

MIDI Channel 3



Now release the encoder. All voices are set to MIDI channel 3.

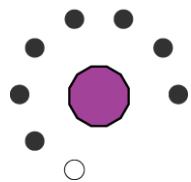
Navigate to voice 1 by holding the encoder and turning it until the LED ring shows the voice 1 selection:

VOICE 1 selected



You don't need to release the encoder, simply turn the harm/midi knob until MIDI channel 1 is shown. Release the encoder and the new MIDI channel will be assigned to voice 1, thus creating a separate part.

MIDI Channel 1



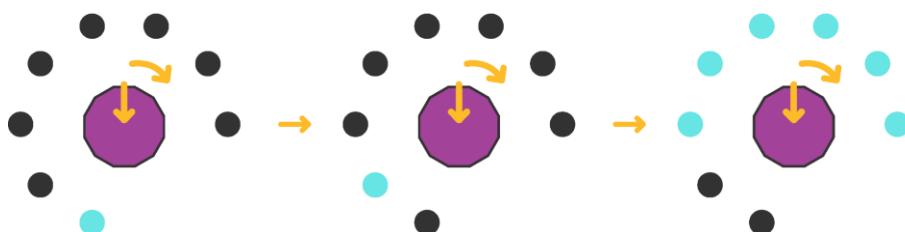
Repeat the process with voice 2, selecting this voice and assigning MIDI channel 2.

During Part selection the available parts should look as follows.

PART 1: Bassline

PART 2: Lead

PART 3: Chords/Pads



## VOICES-PART RESET

You can easily reset Coral to the **default state** where all voices are assigned to MIDI channel 1 and parameters are set to init values.

From the main view (voice status), hold the encoder for at least 5 seconds until you see the LED animation in red color.

# CV and MIDI MODULATION

There are two different sources of modulation: MIDI CC and Pitch Bend messages and the CV inputs.

The resulting value of any voice's parameter is calculated by adding the knob position (or last received CC value) and the CV input value (if the CV is assigned to this voice or part).

- knob value is unipolar (unless in the bipolar parameters: PAN, Filter envelope, Frequency)
- CV modulation is bipolar: +-5V
- CC is unipolar and overrides the parameter's knob value.

**Parameter value** = knob or corresponding CC value + CV modulation

It is possible to modulate each part's parameters separately to create richer and more complex sounds.

## CV MODULATION

The CV modulation: **atkdec**, **filter**, **harm**, **timbre**, **morph**, **trig**, **amp** and **oct** inputs affect the voices of the selected part only.

By default, there's only one part, thus all the voices will be triggered or affected by any of the modulation CVs.

## POLY OR UNISON CV MODES

If “**polycv**” setting is set to “**1**”, different CV pitch values will trigger different voices thus allowing to play Coral **polyphonically** with 1 oct CV and 1 trigger.

If “**polycv**” setting is set to “**0**”, all voices will play in **unison**.

This setting can be found in the **options.txt** file in the SD Card under the System folder.

## CV INPUTS

### **atkdec**

Increases or decreases the duration of attack, decay and release of both AMP and MOD ADSR envelopes. Negative voltages will make the sound “pluckier” and positive voltages will create softer and longer sounds.

### **filter**

Positive voltages increase the filter frequency cutoff and viceversa.

### **harm, timbre, morph**

Positive voltages apply positive modulation on these parameters. Negative voltages apply negative modulations.

### **trig**

Triggers the internal envelopes.

### **amp**

Controls the amplifier level.

### **oct**

CV/Oct input. The octave (**oct**) and frequency (**freq**) knob parameters are taken into account to get the final pitch of the voices.

### **part**

The voltage on this CV input determines which Part is affected by the rest of the CV inputs.

## PART CV INPUT

### PART MODULATION

One way to choose which part is affected by the external CV modulation is by using the PART CV input. The affected part by the CV modulation can be addressed with the PART CV input. (Only 0 to +5V voltages are considered).

Example:

If you have two PARTS, the first part will be addressed if the voltage in PART CV is between 0 and 2.5V.

Otherwise the second PART will be addressed if the voltage is between 2.5 and 5V.

NOTE: There's a little hysteresis to avoid continuous jumps of the selected part on the voltage edges.

The behavior of the PART CV input can be changed in the options.txt file in the SD Card.

If “**cvp**” setting is set to “**0**”, PART CV selects which part is affected by CV modulation as explained above.

### ENGINE MODULATION

If “**cvp**” setting is set to “**1**”, PART CV **selects which engine** is used instead.

This setting can be found in the **options.txt** file in the SD Card under System folder.

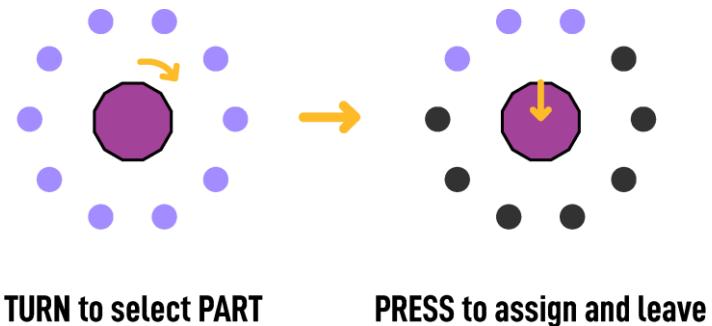
## CV ASSIGN SCREEN

How to assign cv modulation to parts ?

When there's no voltage sent to the Part CV, the modulation of the front panel CVs can be routed to one specific PART using the CV Assign screen.

Quick tap the encoder 3 times to access this screen from the main default view, right after save screen. Once in the CV Assign screen (**purple color**), turn the encoder to choose the part that will be affected by the CV modulation. Tap again to confirm the selection, and you will see the confirmation animation.

NOTE: if any voltage is applied to the PART CV, the part selection made on this screen will be overridden.



## MIDI MODULATION

With MIDI CC messages you can modulate any parameter inside Coral.

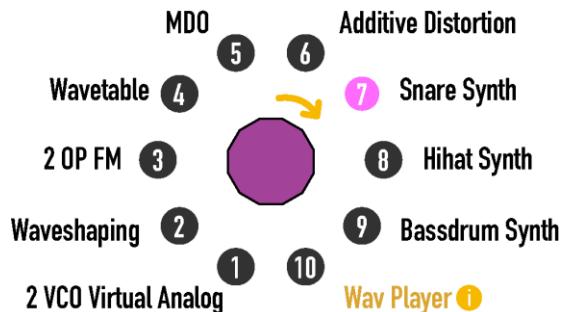
The messages will be filtered by the MIDI channel and the CC values will be applied to the Part that has the same MIDI channel.

- CC is unipolar and overrides the knob value.

Check the [MIDI Implementation](#) section for more information.

# ENGINES

There are different configurations of engines available in the form of various firmwares. They can be downloaded in the [Coral's update website](#).



*Engines configuration of the No drums version*

The engines are explained next.

## VIRTUAL ANALOG

Two detuned virtual analog oscillators with continuously variable waveforms. The Second oscillator is synced to the first one

Virtual-analog synthesis of classic waveforms.

### CONTROLS:

**harm:** detuning between the two oscillators following predictable musical intervals.

**timbre:** variable square, from narrow pulse to full square to hard sync formants.

**morph:** variable saw, from triangle to saw with an increasingly wide notch.

## WAVESHAPER

An asymmetric triangle processed by a waveshaper and a wavefolder.

### CONTROLS:

**harm:** waveshaper waveform.

**timbre:** wavefolder amount.

**morph:** waveform asymmetry.

# FM

Two sine-wave oscillators modulate each other's phase.

## CONTROLS:

**harm:** frequency ratio.

**timbre:** modulation index.

**morph:** feedback, in the form of operator 2 modulating its own phase (past 12 o'clock, rough) or operator 1's phase (before 12 o'clock, chaotic).

# WAVETABLE

**harm**, **timbre** and **morph** are used to navigate in the 3 dimensions of the wavetable, Z, X, and Y respectively. Three waves are combined and cross-faded to generate the sound.

Only one wavetable can be loaded at a time, it's the same wavetable file for all the voices. You can store more than one wavetable file in the SD card but only one will be loaded. The wavetable filename must contain the prefix "WAVETABLE" and the extension must be ".wav".

You can create and export your wavetables using the **OXI Wave** desktop App. X, Y and Z controls in the module correspond to the controls in the "Grid View" of the app.

---

*Since you can set different parameters for each voice, each one can have different positions in the wavetable creating richer sounds.*

---

# DUAL WAVETABLE OSC

Two Wavetable Oscillators that can be detuned following predictable intervals. Load or Design your custom Wavetable and create complex lead sounds.

## CONTROLS:

**harm:** detuning between the two oscillators following predictable musical intervals.

By manipulating this setting, you can vary the pitch of the second oscillator to create harmonic or dissonant effects in relation to the main oscillator.

**timbre:** wavetable position of the First oscillator.

**morph:** wavetable position of the Second oscillator.

---

*In this engine, the wavetable is navigated in a single dimension.*

---

## MDO

MDO stands for: Multiple Detuned Oscillator.

Each voice contains 8 detuned oscillators that morph between SAW, SQUARE and PWM.

### CONTROLS:

**harm:** detuning amount

**timbre:** waveform morph from saw to square

**morph:** PWM of the square waveform

## STRING

Digital string / resonator modeling.

### CONTROLS:

**harm:** amount of inharmonicity, or material selection.

**timbre:** excitation brightness and dust density.

**morph:** decay time (energy absorption).

## ADDITIVE DISTORTION

Harmonic / additive synthesis with two kinds of distortion, Wavefolding and Diode emulation.

The different ways the distortions hit the harmonic content creates a larger palette of sound, from mild tones to highly distorted basslines.

### CONTROLS:

**harm:** harmonic content center

**timbre:** wavefolding amount

**morph:** diode distortion amount

# 3VCO

3x variable-saw virtual analog oscillators that seamlessly morph from Triangle to Saw, to Square and Pulse waveforms with dynamic PWM capabilities. 2 of the 3 oscillators can be detuned in relation to the main oscillator.

## CONTROLS:

**harm:** adjusts the detuning of the second oscillator. By manipulating this setting, you can vary the pitch of the second oscillator to create harmonic or dissonant effects in relation to the main oscillator.

**timbre:** defines the waveform of the oscillators, offering a range from triangle, to saw, square, and PWM (Pulse Width Modulation) waveforms.

**morph:** manages the detuning of the third oscillator. Similar to the Harm control, but for the third oscillator, it allows for the creation of complex sonic layers by detuning from the main oscillator.

## NOTES:

The detuning controls (Harm and Morph) are finely calibrated to easily align with musical intervals, such as +7 and +12 semitones. This feature facilitates the creation of musically coherent detuning effects, while still providing the flexibility to detune by a few cents.

# ACID

It's our take on the 303 style synth. A variable-shape virtual analog oscillator that seamlessly morphs from the classic Saw to Square and Pulse waveforms with dynamic PWM capabilities. There is one post-filter distortion and the edgy filter has been finely tuned for a gritty sound. You can add accents via MIDI or via the AMP CV input. Morph controls the accent amount.

## CONTROLS:

**harm:** controls the overdrive distortion

**timbre:** defines the oscillator waveform

**morph:** sets the accent amount

## NOTES:

How to get glides?

- Use a pair of V/oct CV and Gate and send glides from your sequencer or change the pitch while gate is active.
- If using MIDI, create a MONO (1-voice) part and send legato notes (almost overlapping notes should be also enough to trigger a glide).

How to get accents?

- You can feed CV modulation to any of these (for example the Vel or Mod outputs of a sequencer).
- With MIDI you can play with the velocity levels.

## HI HAT SYNTH

Two hi hat models blend together.

**harm:** balance of the metallic and filtered noise.

**timbre:** high-pass filter cutoff.

**morph:** crossfade between both models.

**mod dr:** affects the decay of the internal envelope that has an overall impact on the amplitude and characteristics of the sound. The AMP envelope can be further adjusted with **amp dr**.

## SNARE SYNTH

Two analog snare drum models blend together.

**harm:** balance of the harmonic and noisy components.

**timbre:** balance between the different sound components of the drum, body and noise.

**morph:** crossfade between both models.

**mod dr:** affects the decay of the internal envelope that has an overall impact on the amplitude and characteristics of the sound. The AMP envelope can be further adjusted with **amp dr**.

## HI HAT / SNARE SYNTH

It offers a combination of one analog snare drum and one hi-hat model.

**harm:** balance of the harmonic and noisy components.

**timbre:** balance between the different sound components of the snare or high pass filter for the hi-hat.

**morph:** crossfade between snare and hi-hat sound model.

## KICK MODEL

Two kick / bass drum digital emulations blend together.

**harm:** attack sharpness and overdrive.

**timbre:** brightness.

**morph:** crossfade between both models.

**mod dr:** affects the decay of the internal envelope that has an overall impact on the amplitude and characteristics of the sound. The AMP envelope can be further adjusted with **amp dr**.

## WAV PLAYER

Play any sample of **any bit depth, sample rate and length, mono or stereo**.

You can play your samples polyphonically. One shot is currently the only way to play samples.

You can organize your samples in 10 folders with 32 samples maximum per folder. If the folder is empty, Coral ignores it. Since Firmware 0.7.0 folders and samples are alphabetically ordered.

Each voice can have any sample from any folder. Furthermore, sample and folder selection are modulable. Changing the sample introduces 1-2 ms of latency with a suitable SD card.

**harm:** overdrive.

**timbre:** sample selection.

**morph:** folder selection.

16 bit, 24 bit, 32 bit and 32 float bit depths as well as 44100 or 48000 sample rates are supported.

Samples can be pitched up to 18 semitones and down to 24 semitones by internally adjusting the playback speed. Coral doesn't include any audio warping algorithm.

Samples can also be played polyphonically.



*Intensive use of the sampler may result in sound artifacts. It will depend on the bitrate of the sample, the playback speed, audio channels, etc. The speed of the SD card has a great impact on the sample player performance. You can get a U3 class card for optimal results.*



If you are experiencing sound artifacts, try reducing the number of voices that use the sampler engine or that access the same sample, especially when using long samples. Also, converting the samples to 16 bit depth improves the processing speed.

# ENGINE CONFIGURATIONS

In the Update section of the Coral website, you can get different combinations of engines.

## NO DRUMS VERSION

1. Virtual Analog
2. Waveshape
3. 2op FM
4. Wavetable
5. MDO
6. String
7. Additive oscillator with 2 types of distortion
8. ACID
9. 3 Osc Virtual Analog
10. Wavplayer

## DRUMS VERSION

1. Virtual Analog
2. Waveshape
3. 2op FM
4. Wavetable
5. MDO
6. Additive oscillator with 2 types of distortion
7. Hihat synth
8. Snare synth
9. 2 Model Bassdrum Synth
10. Wavplayer

## **DRUMS ACID 3VCO VERSION**

1. Virtual Analog
2. Waveshape
3. 2op FM
4. Wavetable
5. MDO
6. ACID
7. 3 Osc Virtual Analog
8. Snare Hihat Synth
9. 2 Model Bassdrum Synth
10. Wavplayer

## **DUAL WAVETABLE (NO DRUMS)**

1. Virtual Analog
2. Dual Oscillator Wavetable (2 wavetable oscillators per voice)
3. 2op FM
4. Wavetable (with custom waveforms)
5. MDO
6. String
7. Additive oscillator with 2 types of distortion
8. ACID
9. 3 VCO Virtual Analog
10. Wavplayer

# SOUND EFFECTS

There are three effects, **Space/reverb**, **Chorus/ensemble** and **Delay** (Overrides Noise).

All the effects act as send effects and are common for all the voices. The amount of each effect depends on the level of each voice and the send amount.

The space engine is not only a reverb but also improves the stereo image of the dry signal.

Alternative to Chorus, you can have a **High Pass** filter (stereo) adjustable per voice that can be enabled in the options.txt file. Check [the options section](#) to know all the details.

# MIDI IMPLEMENTATION

## CC'S TABLE

With MIDI CC messages you can modulate any parameter inside Coral.

The messages will be filtered by the MIDI channel and the CC values will be applied to the Part that has the same MIDI channel.

CC is unipolar and overrides the internal parameter value.

MIDI CC TABLE	
CUTOFF	· CC 01
RESO	· CC 02
F.ENV	· CC 03
LEVEL	· CC 04
PAN	· CC 05
OCTAVE	· CC 06
GLIDE	· CC 07
GLIDE MODE	· CC 08
HARMO	· CC 11
TMBRE	· CC 12
MORPH	· CC 13
AMP ATTACK	· CC 14
AMP DECAY	· CC 15
MOD ATTACK	· CC 16
MOD DECAY	· CC 17
SUSTAIN	· CC 18
NOISE	· CC 19
CHORUS	· CC 25
SPACE	· CC 26
DELAY	· CC 27
SOUND ENGINE	· CC 30
SPACE LENGTH	· CC 40
SPACE LOW PASS	· CC 41
DELAY TIME	· CC 44
DELAY FEEDBACK	· CC 45
DELAY SPREAD	· CC 46
DELAY LOW PASS	· CC 47

# PROGRAM CHANGE

Program Change messages with a value 1 to 10, received from **any** MIDI channel, will make the Coral to load a preset from 1 to 10 respectively.  
You can disable this feature in the options.txt file.

# PITCH BEND

Pitch bend will be applied to the part whose MIDI channel matches the one of the message.  
Pitch bend range is by default  $\pm 2$  semitones. It can be changed in [the options file](#).

# GLIDE

Smooth transition of voice's pitch from one note to the next.

In polyphonic mode where 1 part can have more than one voice assigned, thus different notes can trigger different voices, the GLIDE effect may not be obvious. If you want a deterministic way of getting a glide effect, you should try with a single-voice (mono) part.

To change this glide time send MIDI CC values to the **CC 07**.

# GLIDE MODE

0 selects glide **ALWAYS**, from 1 to 127 glide **LEGATO** on **MIDI CC 08**.

# MPE

Coral now supports MPE controllers!

MPE allows you to control pitch bend or horizontal finger movement, poly aftertouch or pressure, and slide or vertical finger movement on a per-note basis.

Aftertouch is mapped to modulate the filter cutoff and volume for immediate playability.

You can assign slide, or any other expressive dimension from your controller, to any of the CC parameters of Coral.

To enable MPE on your device you need to add the following line to the `options.txt` file: `mpeena 1`

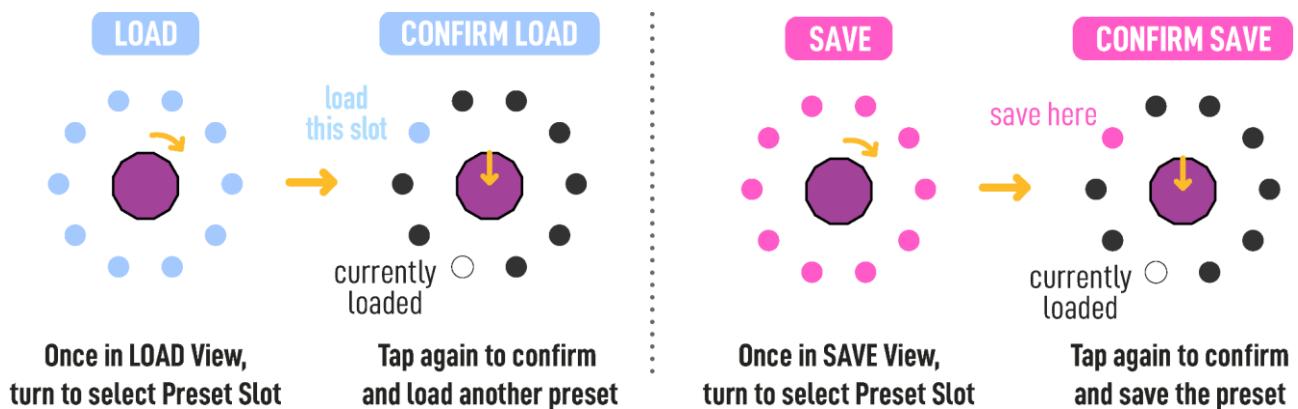
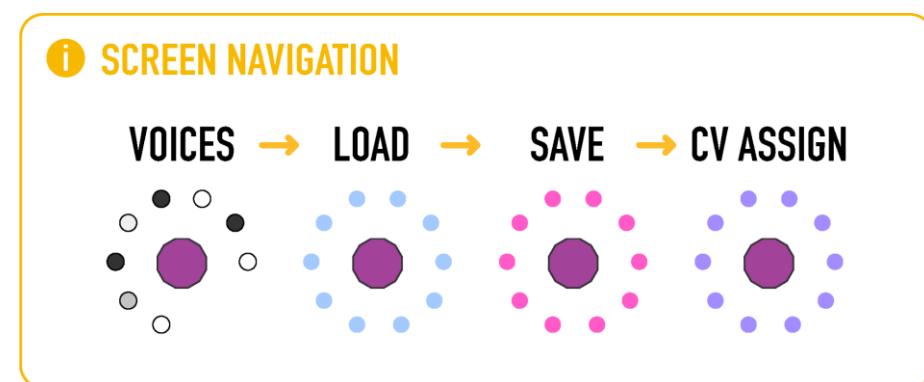
# PRESETS

You can Save and Load / recall all the parameters and voice configuration of the module in 10 preset slots. Everything will be saved so it is found exactly as you left it when you saved it.

Presets can be manually loaded or recalled with Program Change MIDI messages.

Remember, the screen navigation sequence is as follows. Tap the encoder to sequentially jump between screens. Turning the encoder in any of the screens activates the selection mode, which means that the next encoder tap will confirm the selection.

Turn any knob to exit and go back to the main view (voice status).

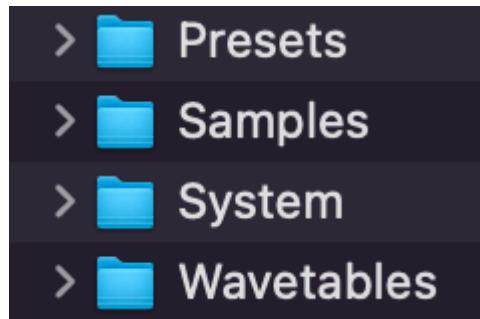


# SD CARD

The Micro SD card with factory content Must be always inserted. A Class 10 or preferably higher with a reading speed of at least 70 Mb/s is required to use the wav player intensively.

If you want to use a larger or faster SD Card than the one provided with the module, ensure that it is formatted to FAT32. Then, copy all the files from the original factory card to the new one.

The folder structure required in the SD Card looks as follows:



The System folder contains data required for the proper operation of the module, the Calibration and the **options.txt** file with the user settings.

Factory content download: [LINK](#)

# WAVETABLE

The Wavetables folder should contain at least one .wav wavetable file. You can make your own using the OXI Wave App.

As long as the naming is right: WAVETABLE + your name.wav, Coral will load one wavetable file for the wavetable engine.

At the moment, only one wavetable will be loaded that will be played by all voices.

# OPTIONS.TXT

To further customize the behavior of Coral, you can place a “**options.txt**” plain text file in the **System** folder of the SD card (if it’s not already been added in production).

As of today, there are the following settings available. You can simply copy these lines and write a 0 or 1 depending on what you want. The order in which the options appear in the “**options.txt**” file does not matter!

## **polycv**

If “**polycv 1**” setting is set to **1**, different CV pitch values will trigger different voices thus allowing to play Coral **polyphonically** with 1 oct CV and 1 trigger.

If “**polycv 0**” setting is set to **0**, all voices will play in **unison**.

## **encpri**

If “**encpri 0**” encoder turn selects engine (push and turn for voice/part selection)

If “**encpri 1**” encoder turn select voice/part (push and turn for engine selection)

## **cvpart**

If “**cvpart 0**” setting is set to **0**, PART CV selects which part is affected by CV modulation as explained above.

If “**cvpart 1**” setting is set to **1**, PART CV **modulates the selected engine** instead.

## **mpeena**

Add “**mpeena 1**” to enable MPE on Coral. Otherwise, MPE would be disabled.

NOTE: On MPE mode, you cannot select the MIDI channels of the different voices since that's automatically done by the MPE engine.

## **pbrang**

The Pitch Bend ( PB ) range can be adjusted in semitones using this option. It can go from 1 to 48. Pitch bend can be set using this option: **pbrang 24**

You can change it to any pitch bend range like: **2, 12, 24, 48**, etc.

## **hpfilt**

Add a High Pass filter (stereo) adjustable per voice that may help to better fit Coral in your mix. The HP filter replaces the Chorus and takes over its control (the "chorus" secondary parameter).

HP filter can be enabled in the **options.txt** file adding the following line: **hpfilt 1**

## **delena**

If “**delena 1**” Delay enabled. The Noise secondary parameter is overridden by the Delay send amount.

Delay can be enabled in the **options.txt** file adding the following line: **delena 1**

## **vumetr**

Enables the master VU Meter. LEDs 9 and 10 represent the master level.

VU Meter can be enabled in the **options.txt** file adding the following line: **vumetr 1**

## **ledalw**

Show a subtle indication of the selected part of voice in the main screen, can be enabled in the **options.txt** file adding the following line: **ledalw 1**

## **pcigno**

When set to “**pcigno 1**”, Coral ignores Program Change MIDI messages.

## **extpre**

When set to “**extpre 1**”, Enable up to 100 presets divided in 10 groups of 10.

# OXI WAVE APP

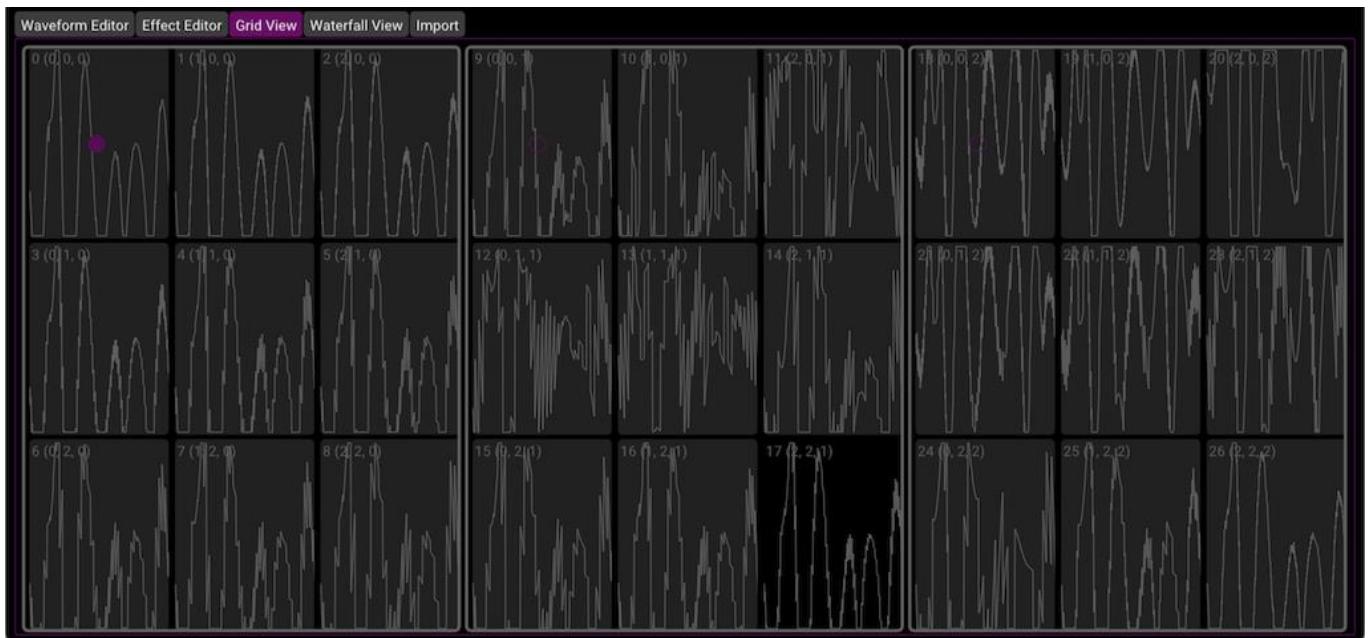
The wave table used by the Wavetable engine in Coral can be edited and replaced by a custom one. For this purpose you can use the OXI Wave software for Win and Mac, based on the Wave Edit App by Andrew Belt and Sphere Edit by Dan Green.

In the top menu click ‘Open wavetable’ to open a Wavetable created for the CORAL.

If you want to start from scratch, you need to fill all the 27 waves that make up the wavetable. Otherwise there may be silent areas in the wave table.

Once you are happy with your wavetable, click ‘Save Wavetable As…’.

In the GRID VIEW of the app you can visualize the 3 blocks of 3 by 3 waves. Remember that **harm**, **timbre** and **morph** correspond to the 3 dimensions of the wavetable, Z, X, and Y respectively.



It's important that every waveform of the wavetable has its volume normalized (the amplitude of the waveform is the maximum possible without clipping). Otherwise there may be louder and softer regions or the Wavetable engine will sound quieter compared to other Engines.

# CALIBRATION

## STEP 1

Turn the following potentiometers fully **clockwise**:

- **Amp atk**
- **Amp dr**
- **Sust**
- **Mod atk**
- **Mod dr**
- **F reso**

Turn the following Trimmer fully **counter clockwise**:

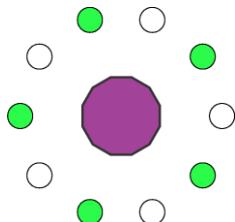
- **F env**

## STEP 2

UNPLUG all the patch cables from the module.

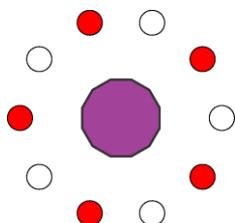
## STEP 3

Keep pressed the encoder for 5 seconds until the ring looks like:



## STEP 4

Tap again and the LED ring should look like:



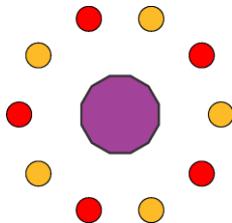
## STEP 5

Patch the **OCT** CV input and send **-1V** from a well calibrated source.

Depending on the Voltage source (CV sequencer or keyboard), -1V may correspond to a different MIDI Note. On the OXI One C1 note outputs -1V.

## STEP 6

Tap the encoder once and the ring should look like:

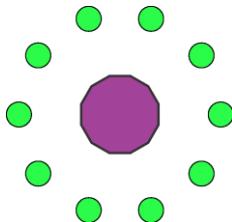


## STEP 7

Send +1V to the OCT input from a well calibrated source and tap the encoder again. On the OXI One C3 note outputs +1V.

## STEP 8

Tap the encoder again. If the process was done successfully, the confirmation animation should appear:



# ACKNOWLEDGMENT

Special thanks to **Mutable Instruments** for open sourcing their modules, some engines have been taken from there. This module wouldn't be possible without that.

Thanks to **NANO Modules** for building the Digimon, the developing platform where the Coral was born.

Thanks to our **Beta Testers** for the feedback and bug hunting.

Thanks to **Andrew Belt** for the beautiful Wave Edit App.

Thanks to everyone that contributes to making the Eurorack world so fantastic.

# DECLARATION OF CONFORMITY

This product complies with the requirements of **European Directive 2014/53/EU & Directive 2011/65/EU**.

The full text of the EU declaration of conformity is available at the following internet address  
[www.oxiinstruments.com/](http://www.oxiinstruments.com/)



## ENVIRONMENTAL ISSUES:



This symbol indicates that this product should not be treated as domestic waste. Once its useful life has ended, it must be taken to a relevant collection point for the recycling of electrical appliances. Through the correct recycling of batteries and electrical devices, we contribute to avoiding risks to environmental health and safety.

Product Disposal Note: If this product is damaged beyond repair or, for any reason, its useful life is deemed to have expired, please inform yourself about local, state and European regulations regarding the proper disposal and recycling of products containing lead, batteries, plastics, among other materials, as well as collection points for these types of products.

# TERMS OF WARRANTY

## **REFUND POLICY (only in European Union)**

The consumer has a total of 14 days from the acquisition of the product to be able to return the product thus receiving a full refund of the price of it. The product must be in the same state and with all the original content in order to receive a full refund.

Shipping costs will be paid by the customer.

## **WARRANTY**

OXI Instruments warrants the included hardware product and accessories against defects in materials and workmanship for two years from the date of original purchase. Unless proven otherwise, it will be presumed that the breaches of conformity manifested in a period of six months from the delivery of the product already existed on that date.

The warranty will not cover the repairing costs of the following cases:

- Misuse of OXI Coral, whether subject to extreme conditions, as using it incorrectly.
- Improper handling of the product.
- Normal wear and tear, nor damage caused by accident or abuse.
- Malfunction due to the use of accessories not authorized by OXI Instruments.

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