OUTERSECT MODELER

USER GUIDE

THE OUTERSECT MODELER

The Outersect Modeler is a physical modeling synthesizer using a general purpose mathematical model. It is not based on any one type of instrument, nor does it use samples. The modeler sounds and behaves like a physical instrument. It feels "organic" and "alive" compared to sample players and conventional synthesizers.

As a keyboard player and producer, I always wanted a synthesizer with all the nuances and expressiveness of physical acoustic instruments. I tried many different types of synthesizers and sample players looking for that instrument. None of them did all the things I wanted. So I made my own.

I hope you enjoy playing the modeler as much as I do.

You can contact me at modeler@outersect.net.

Rob (Outersect)

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GETTING STARTED

Download & Install the Outersect Modeler

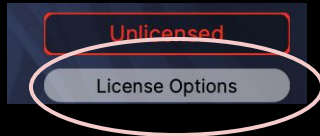1.   Download the modeler from https://www.tracktion.com/products/modeler

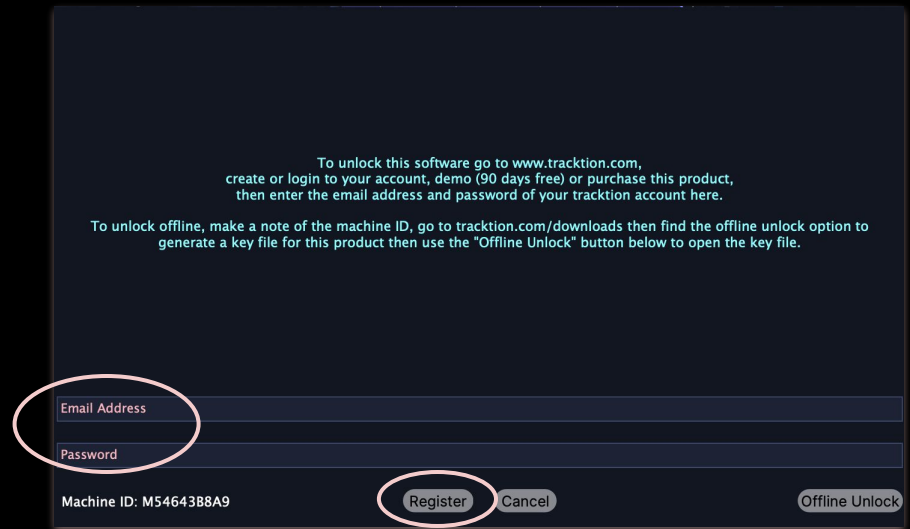2.   Choose "Free Trial" or "Buy" from the upper right corner:

3.   Click on the installer to start the install.

4.   On first running the modeler, click "License Options" in the upper right corner:

5.   Enter the email address and password for your Tracktion account in the dialog then click "Register":

To unlock this software go to www.tracktion.com, create or login to your account, demo (90 days free) or purchase this product, then enter the email address and password of your tracktion account here.

To unlock offline, make a note of the machine ID, go to tracktion.com/downloads then find the offline unlock option to generate a key file for this product then use the "Offline Unlock" button below to open the key file.

Email Address

Password

Machine ID: M54643B8A9   Register   Cancel   Offline Unlock

MacOs 10.13 & higher :   AAX, AU, VST3, Standalone (in /Applications/)
Windows 10 & higher :   AAX, VST3, Standalone (in \Program Files\Modeler\)

SOUND BROWSER

The upper left corner of the modeler shows the sound selector. Clicking the "<" or ">" buttons will select the previous or next sound within the selected categories, or within all categories if no categories have been chosen.

Click on "BROWSE" to bring up the sound browser:

Sound names can searched in the *Search* bar:

SAVE DIALOG: SAVING SOUNDS & CREATING CATEGORIES

How to Save Sounds

1. Click *Save* from the Sound Selector in the upper left corner of screen or *Save As* in the Sound Browser to bring up the *Save Dialog*:

2. Click *Save* in the lower right corner of the *Save Dialog* window.

How to Save a New Category

From the the Save Dialog, type the name of your new category in the *New Category* field then hit enter or click on the "+" button.

PATCH NAME   Reed

AUTHOR   Outersect

FOLDER
Bass
FX
Guitar
Keys
Lead
Pads
Percussion
Walkthrough
Waveform Demo Song
+ New Category

NOTES
Notes

Cancel   Save
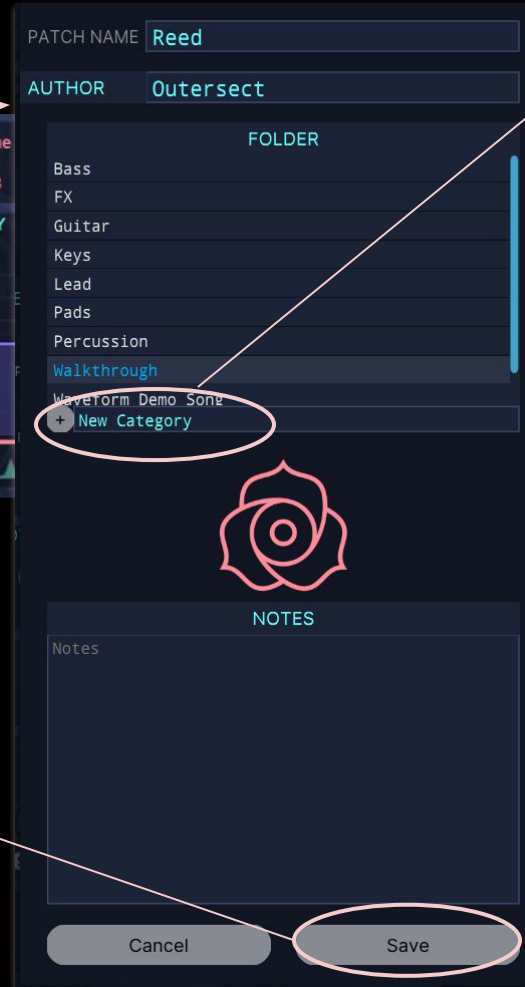
SETTINGS

Clicking on the Outersect Modeler graphic (flower) in the left upper corner of the sound selector will bring up the settings dialog:

The settings dialog is needed mostly for the standalone version.

The plugin versions get most of their settings from the host application.

The BPM control of the sound selector only shows up in the standalone version.

Plugins use the host application BPM.

PARAMETER VALUE DISPLAY

The Parameter Value Display shows the name and value of the control the mouse is over.

Example: The mouse cursor points to the *Resonator's Volume* knob and "Resonator Volume" is displayed in the Parameter Value Display:

MODELER PARAMETERS | RESONATOR

The RESONATOR simulates a resonant object like a string, a tube, or a tine. The Resonator is more or less equivalent to an oscillator - but a physical modeling oscillator also has many properties of both an envelope and a filter.

Decay
controls how quickly loudness of any audio stimulation (like a pick) dies out

Dispersion changes the tone of the Resonator continuously from a sawtooth-like wave at the highest setting to a square-like wave at the lowest

Compander
(Compressor/Expander) tries to keep the resonator loudness within a limited range, neither increasing nor decreasing

Volume
changes the loudness of the Resonator

Tune changes the tuning in cents, range is +/- 100

Damping makes high frequencies die out more quickly than low frequencies

Distortion
is a simulated tube-type distortion effect applied to the output of the RESONATOR

Transpose
changes the pitch of the RESONATOR in steps, range is +/- 24

RESONATOR | HARMONIC & HARMONIC MIX

Harmonic & Harmonic Mix work together to simulate "Natural Harmonics", "Artificial Harmonics", and "Pinch Harmonics".

Harmonic selects the harmonic . 1 = no harmonic effect

Harmonic Mix controls the intensity of the harmonic effect when **Harmonic** > 1

A quick introduction to these techniques on guitar is available at *Play Right Hand and Artificial Harmonics on Classical Guitar* on YouTube.

RESONATOR | FB HARMONIC, Q & FEEDBACK

Feedback, FB Harmonic, & Q - work together to create the sounds of amplified acoustic instrument feedback.

Q quantize the FB Harmonic control so that it snaps to the nearest integer harmonic, rather than allowing positions "in between" harmonics

FB Harmonic controls the feedback phase relative to the RESONATOR, selecting which harmonic is emphasized

Feedback controls the intensity of the feedback effect. Negative values are 180 degrees out of phase

PICK

Pick is one way to stimulate the RESONATOR. It acts like a guitar pick on a string.

Level
controls the overall loudness of the pick

Warp
changes the pick shape in physically impossible ways that sound interesting

Position controls where on the virtual string a pick occurs. Position 2 is the 2nd harmonic, position 3 the 3rd harmonic & so on

Noise
uses white noise to stimulate the string like the original Karplus Strong plucked string algorithm

Shape changes the sound of the pick by making the pick impulse "thinner" or "thicker"

To turn the PICK completely off, set LEVEL and NOISE to 0.

BOW

The BOW acts like a violin bow, a stick-slip action.

Speed
the rate the BOW is moving across the string/RESONATOR

Pressure
how hard is the BOW pressing on the string/RESONATOR

Position
where on the virtual string is the bow

Width how wide the bow is with respect to the string/RESONATOR length

Reflection how much of the energy on the string/RESONATOR "bounces" off the bow

The Physics Department at The University of South Wales in Sydney, Australia has a great animation that shows how bows work on strings: Bows and Strings.

REED

Simulates a reed blowing into a tube, like a saxophone or a clarinet.

Pressure
how hard you are blowing into the reed

Shape
the tone of the reed

Position   same control as Pick Position & Bow Position applied to the reed

Growl
how much Growl applies to reed

BRASS

Simulates a brass mouthpiece blowing into a metal tube, like a trumpet or a tuba.

Pressure
how hard you are blowing into the brass mouthpiece

Position
the same control as Pick Position & Bow Position applied to brass

Growl
how much Growl applies to brass

GROWL

Simulates the "growl" blowing technique common to reed and brass instruments.

Speed
the rate of the growl

Tune the
tuning of the growl

BODY | BAND FUNCTIONS

The BODY is an 8 -band parametric EQ.

Controlling band parameters:

Band parameters are controlled by moving the sliders on the bottom, right, and top of the frequency response display, or by moving the control point on the display.

Two options for band selection:

Click an icon in the frequency response display.

or

Click the icon of the same color at the bottom of the display.

BODY | BAND & FILTER SETTINGS

The BODY is an 8 -band parametric EQ.

MID BANDS 1-4

Enable (on/off) upper right button

Frequency (20 Hz - 20kHz) on bottom slider

Gain (+/-24 dB) on right slider

Q (0.2-100) on top slider

HIGH BAND

Enable (on/off) upper right button

Shelf (on/off) lower right button

Frequency (20 Hz - 20kHz) on bottom slider

Gain (+/-24 dB) on right slider

Q (0.2-100) on top slider if shelf is OFF

HIGH CUT FILTER

Enable (on/off) upper right button

Frequency (20 Hz - 20kHz) on bottom slider

Slope (-12 dB/Oct - -96 dB/Oct) on right slider

LO CUT FILTER

Enable (on/off) upper right button

Frequency (20 Hz - 20kHz) on bottom slider

Slope (-12 dB/Oct - -96 dB/Oct) on right slider

LOW BAND

Enable (on/off) upper right button

Shelf (on/off) lower right button

Frequency (20 Hz - 20kHz) on bottom slider

Gain (+/-24 dB) on right slider

Q (0.2-100) on top slider if shelf is OFF

The BODY has lots of settings. The SAVE & LOAD buttons on the upper right of the BODY let you SAVE the BODY settings separately from the rest of the patch, or LOAD BODY settings without affecting anything else in the patch.

PICKUPS

The PICKUPS act like two pickups on an electric guitar.

Mix 2
the intensity of the 2nd pickup effect

Freq 2
resonant frequency of the 2nd pickup

Image
creates a stereo image by panning one pickup left & the other right
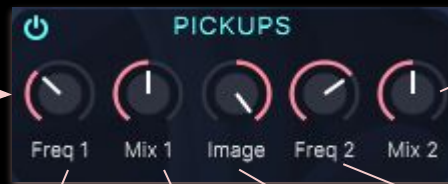
Freq 1
resonant frequency of the 1st pickup

Mix 1
the intensity of the 1st pickup effect. 0.5 (50%) is maximum intensity for one pickup

DELAY

A syncable stereo delay with filters on the feedback path.

Left Delay / Right Delay
delay time. Can be set in Hz or synced to tempo units

Mode
feedback mode: Stereo, X-Cross, or Ping Pong

Mix
wet/dry mix

High Pass/Low Pass
high & low pass filters applied ONLY to the feedback signal

Feedback
delay feedback

CHORUS

Rate
the speed of the chorus effect

CHORUS

Rate   Depth   Feedback   Mix

Mix
wet/dry mix

Depth
the depth of the chorus effect

Feedback
chorus feedback

REVERB

Predelay
delays reverb relative to dry input

Reflections
the level of early reflections

Time
reverb decay time and delay between early reflections

Size
the size of the reverb space

Mix
wet/dry mix

Damping
hi-frequency damping of the reverb space

High/Low Pass
high & low pass filters on the reverb

Volume

Limit

Volume
final output volume

Limiter
limiter on final output

MODULATION SYSTEM

The modulation system consists of modulation sources that connect to modulation destinations using virtual patch cables, similar to a modular system.

- Almost all the controls in the interface can be modulation destinations.
- Some destinations are incompatible with certain sources
- Modulation sources show the patch out icon:
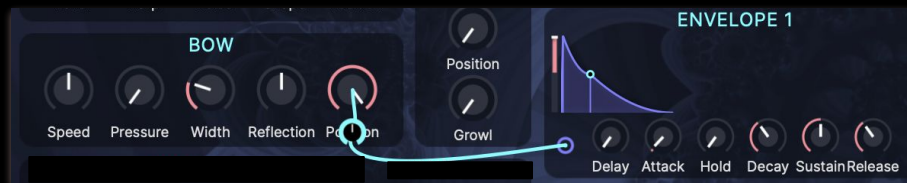
Connect a Modulation Source to a Destination:

1) Click on any modulation source's patch out icon:

Example from *Envelope 1:*

2) Click-drag the parameter you want to modulate as you normally would to move that control.

Example modulates BOW *Position* from *Envelope 1:*

The control you moved will now be modulated by the source you selected. The amount of modulation is initially set by how much you moved the destination control. You can adjust the modulation amount later using the knob on the patch cord.

Remove Modulation:

To remove a modulation, right click on either the source or destination of the modulation you want to remove. A menu will pop up with the option to disconnect the modulation:

MODULATION SOURCES | ENVELOPES

The envelopes are DAHDSR type: DELAY, ATTACK, HOLD, SUSTAIN, RELEASE.

The envelopes have level sliders on the left side.

Envelopes can be scaled and inverted using the level sliders.

level sliders

MODULATION SOURCES | LFO

LFO rates can be set in Hertz or synced to tempo.
They can be retriggered on note down, synced to DAW play
position, or free running. LFOs have level sliders on the left side.

Trigger Mode

Sync

Rate

LFOs can also be
scaled and
inverted using the
level sliders

LFOs 1 & 2 are global (i.e. all voices have the same LFO1 & LFO2
signal).

LFO 3 is per-voice (i.e. each voice has a different LFO 3 signal).

MODULATION SOURCES | PREDEFINED MIDI MODULATION SOURCES

Polyphonic MIDI Sources:

Note - note on number

Velocity - note on velocity

Aftertouch - polyphonic aftertouch

Gate - keyboard gate

Key - "what key is it in?" Like NOTE, but goes from 0-max in 1 octave then repeats

Random - a random value generated with each note on. Like "velocity", but random

Monophonic MIDI Sources:

Modulation - the modulation wheel, midi continuous controller #1

Pitch Bend - the pitch bender - midi pitch bend message

Pressure - keyboard pressure

SUS Mode - Monophonic sources have SUS buttons next to them. When SUS is lit, changes to these monophonic sources only affect notes that are being held down on the keyboard. They do NOT affect notes that are being held by the sustain pedal or are still sounding because of release times.

META KNOBS

Meta Knobs are user definable modulation points. These six modulation knobs can be assigned to midi controllers using the MIDI Learn function, then routed to any combination of knobs using the modulation system. They can also be modulation destinations: the user can modulate meta knobs from envelopes, lfos, or other meta knobs. Note that the meta knobs also have SUS buttons.

MIDI Learn

Most of the controls of the modeler, including the META knobs, can be assigned directly to midi controllers using Midi Learn. The META knobs are quite useful when you want one midi controller to do many different things.
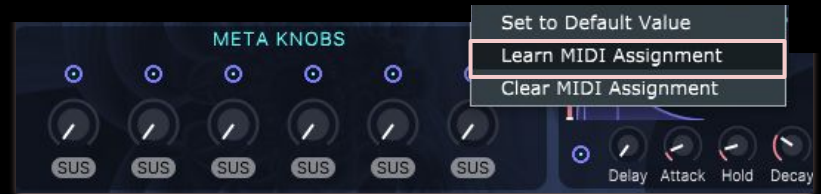
VOICE SECTION

Voices
the number of voices this sound can use

Pitch Bend
pitch bend range

Pitch Bend Slider
the current pitch bend value

Mod Wheel Slider
the current mod wheel value

PORTAMENTO SECTION

Porta
the speed at which notes "glide" from one to the next

Type

Off: no glide

Auto: glide only when a note is already down

On: always glide

Legato
turns off attack when playing smoothly connected (legato) notes

Special Thanks

Tim Rayle - for all the help with the GUI;

Akihiro Nagata - for pushing to make it better;

Sami Chen the Little World Traveler - for everything;

… and everybody at Tracktion.

OUTERSECT MODELER

https://www.tracktion.com/products/modeler

THANK YOU!